

# Echelon Fitness Multimedia LLC

## TEST REPORT

### SCOPE OF WORK

FCC TESTING–ECHKIN24-3399-C

### REPORT NUMBER

210810028SZN-004

### ISSUE DATE

15 October 2021

### [REVISED DATE]

[-----]

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### DOCUMENT CONTROL NUMBER

FCC 15C\_Tx\_b

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## RF TEST REPORT

**Report No.** : 210810028SZN-004  
**Product** : 24 inch Curved Screen-P  
**Model No.** : ECHKIN24-3399-C  
**FCC ID** : 2AWD4-KS243399CUR

**Applicant:** Echelon Fitness Multimedia LLC

**Test Method/  
Standard:** FCC Part 15 Subpart E;  
KDB 789033 D02 v02r01;  
KDB 662911 D01 v02r01;  
KDB 905462 D02 v02;  
ANSI C63.10-2013

**Test By:** Intertek Testing Services Shenzhen Ltd. Longhua Branch  
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**Prepared and Checked by:**

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Date: 15 October 2021

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## Summary of Tests

| FCC Parts                   | Test                                      | Section | Results |
|-----------------------------|-------------------------------------------|---------|---------|
| 15.203                      | Antenna Requirement                       | 1.3     | Pass    |
| 15.407 a (1)/(3)            | Maximum output power test                 | 3       | Pass    |
| 15.407 a (1)/(3)            | Power Spectrum Density test               | 4       | Pass    |
| 15.407 e                    | 6dB Bandwidth                             | 5       | Pass    |
| 15.407 b,<br>15.205, 15.209 | Radiated spurious emission test           | 6       | Pass    |
| 15.207                      | AC line conducted emission test           | 7       | Pass    |
| 15.407 g                    | Frequency Stability                       | 8       | Pass    |
| 15.407 h                    | DFS: Channel Closing<br>Transmission Time | 9.3     | Pass    |
| 15.407 h                    | DFS: Channel Move Time                    | 9.3     | Pass    |
| 15.407 h                    | DFS: Non-Occupancy Period                 | 9.3     | Pass    |

## 1. General information

### 1.1 Identification of the EUT

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product:                   | 24 inch Curved Screen-P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Model No.:                 | ECHKIN24-3399-C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Type of Device:            | Slave device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Nominal Channel Bandwidth: | 802.11a/ac/n-HT20 (20 MHz), 802.11ac/n-HT40 (40MHz)<br>802.11ac-HT80 (80MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Operating Frequency:       | 5150MHz~5250 MHz, 5250MHz~5350MHz,<br>5470MHz-5725MHz, 5725MHz~5850MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Channel Number:            | 4 channels for 5180 MHz ~ 5240 MHz (802.11 a/n20/ac-HT20);<br>2 channels for 5190 MHz ~ 5230 MHz (802.11 n40/ac-HT40);<br>1 channels for 5210 MHz (802.11ac-HT80);<br>4 channels for 5260 MHz ~ 5320 MHz (802.11 a/n20/ac-HT20);<br>2 channels for 5270 MHz ~ 5310 MHz (802.11 n40/ac-HT40);<br>1 channels for 5290 MHz (802.11ac-HT80);<br>8 channels for 5500 MHz ~ 5580 & 5660MHz ~ 5700 MHz<br>(802.11a/n20/ac-HT20);<br>3 channels for 5510 MHz ~ 5550MHz & 5670 MHz<br>(802.11n40/ac-HT40);<br>1 channels for 5530 MHz (802.11ac-HT80);<br>5 channels for 5745 MHz ~ 5825 MHz (802.11a/n20/ac-HT20);<br>2 channels for 5755 MHz ~ 5795 MHz (802.11n40/ac-HT40);<br>1 channels for 5775 MHz (802.11ac-HT80);                                                                                                                                                                                                                            |
| Modulation:                | 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Rated Power:               | DC 12V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Test Date(s):              | 10 August 2021 to 29 September 2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Note 2:                    | When determining the test conclusion, the Measurement Uncertainty of test has been considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## **1.2 Additional information about the EUT**

The equipment under test (EUT) is a 24 inch Curved Screen-P with Bluetooth 5.0 (dual-mode) function operating in 2402-2480MHz, 2.4G WIFI function operating in 2412-2462MHz and 5G WIFI function operating in 5150MHz~5250 MHz, 5250MHz~5350MHz, 5470MHz- 5725MHZ, 5725MHz~5850MHz. The EUT is powered by DC 12V. For more detail information pls. refer to the user manual.

For more detail features, please refer to User's description as file name "descri.pdf".

### **Related Submittal(s) Grants**

This is an application for certification of U-NII device (5GHz Wi-Fi transmitter portion).

For the BT classic function was tested and demonstrated in report 210810028SZN-001.

For the BT BLE function was tested and demonstrated in report 210810028SZN-002.

For the 2.4GHz WIFI function was tested and demonstrated in report 210810028SZN-003.

## **1.3 Antenna description (15.203)**

The EUT uses Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

Antenna 1 Gain: 1.6 dBi Max for 5G WIFI.

Antenna 2 Gain: 1.6 dBi Max for 5G WIFI.

Directional Gain: 4.6 dBi

## 1.4 Peripherals equipment

| Description                          | Manufacturer | Remark                                                                          |
|--------------------------------------|--------------|---------------------------------------------------------------------------------|
| AC ADAPTER<br>(Provided by Client)   | Rongweixin   | Model: Rrc0653-1205000D<br>Input: 100-240V~ 50/60Hz 1.5A<br>Output: DC 12 V=5 A |
| Power Cord<br>(Provided by Client)   | ---          | Unshielded, 1.5m                                                                |
| TF card<br>(Provided by Intertek)    | Kingston     | class10                                                                         |
| USB*2<br>(Provided by Intertek)      | SanDisk      | Model: SDCZ36-002G-P36                                                          |
| HDMI Cable<br>(Provided by Intertek) | ---          | Unshielded, 120cm                                                               |
| Test TV<br>(Provided by Intertek)    | SAMSUNG      | Model: U28H750UQ                                                                |
| Test TV<br>(Provided by Intertek)    | SONY         | Model: KDL-24EX520)                                                             |
| AUX Cable<br>(Provided by Intertek)  | ---          | Unshielded, 150cm*2                                                             |
| RJ45 Cable<br>(Provided by Intertek) | ---          | Unshielded, 160cm*2                                                             |
| Type C Cable                         | ---          | Unshielded, 150cm                                                               |
| Speaker                              | Victonic     | Model: GSB710                                                                   |
| PC                                   | Apple        | Mac Mini                                                                        |
| Laptop                               | Dell         | Latitude 2480                                                                   |

## **2. Test specifications**

### **2.1 Test standard**

The EUT was performed according to the procedures in FCC Part 15 E, Section 15.203, 15.207, 15.209, 15.407 and ANSI C63.10/2013, method of measurement: KDB 789033.

The test of radiated measurements according to FCC Part 15 Section 15.33(a) had been conducted and the field strength of this frequency band was all meet limit requirement, thus we evaluate the EUT pass the specified test.

The AC power conducted emissions was investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz (15.207 paragraph).

Radiated emissions were investigated cover the frequency range from 9KHz to 30MHz using a receiver RBW of 9kHz, from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz, VBW of 3MHz, Detector=Peak record for Peak reading, RBW of 1 MHz, VBW of 3MHz, Detector=RMS record for Average reading recorded on the report.

The EUT setup configurations please refer to the photo of radiated setup photos.pdf & conducted setup photos.pdf.

### **2.2 Operation mode**

The EUT was supplied by and it was run in TX mode that was controlled by client provided RF testing program.

The EUT was transmitted continuously during the test. The worst case test result was showed in the report.

With individual verifying, the maximum output power was found at 6 Mbps data rate for 802.11a mode, 6.5 Mbps data rate for 802.11n-HT20 mode, 13.5 Mbps data rate for 802.11n-HT40 mode. 29.3 Mbps data rate for 802.11ac-HT80 mode. The final tests were executed under these conditions and recorded in this report individually.



## **2.3 EUT Exercising Software**

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

### Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test software: RFTest Tool V5.4 installed in the EUT.

### 3. Maximum Output Power test (FCC 15.407)

#### 3.1 Operating environment

Temperature: 25 °C  
Relative Humidity: 55 %  
Atmospheric Pressure: 1011 hPa

#### 3.2 Test setup & procedure

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to Power Meter and the measurement method refer to 789033 D02. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

#### 3.3 Limit

| Operating Frequency (MHz) | Max Conducted TX Power          | Max EIRP                     |
|---------------------------|---------------------------------|------------------------------|
| 5150~5250                 | 30dBm (1W) for master device    | 4W (36dBm) with 6dBi antenna |
|                           | 24dBm (250mW) for client device |                              |
| 5250~5350                 | 24dBm (250mW) or 11dBm+ 10logB* | 1W (30dBm) with 6dBi antenna |
| 5470~5725                 | 24dBm (250mW) or 11dBm+ 10logB* |                              |
| 5725~5850                 | 30dBm (1W)                      | 4W (36dBm) with 6dBi antenna |

Remark: 1) \*Where B is the 26dB emission Bandwidth in MHz.  
2) The device was declared as Slave device.  
3) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.  
4) In MIMO (2Tx), Ant1+Ant2 Directional gain = GANT + 10 log(N) dBi = 1.6 + 10 log(2) = 4.6 dBi < 6 dBi.

#### 3.4 Measured data of Maximum Output Power test results

##### Max Conducted TX Power

The more detail please refer to "Appendix of 210810028SZN-004" Appendix B1.

##### Max EIRP

The more detail please refer to "Appendix of 210810028SZN-004" Appendix B2.

## 4. Power Spectrum Density test (FCC 15.407)

### 4.1 Operating environment

Temperature: 25 °C  
Relative Humidity: 50 %  
Atmospheric Pressure: 1013 hPa

### 4.2 Test setup & procedure

#### Method of Measurement:

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz/500KHz, the video bandwidth set at 3 MHz/2MHz (measurement method refer to KDB 789033 D02). Power spectrum density was read directly and cable loss reading to obtain power at the EUT antenna terminals.

### 4.3 Limit

| Operating Frequency (MHz) | Max Conducted Power Spectral Density        |
|---------------------------|---------------------------------------------|
| 5150~5250                 | *17dBm/MHz for master device                |
|                           | 11dBm/MHz for mobile/portable client device |
| 5250~5350                 | 11dBm/MHz                                   |
| 5470~5725                 | 11dBm/MHz                                   |
| 5725~5850                 | 30dBm/500KHz                                |

Remark: 1) The device was declared as Slave device.  
2) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.  
3) In MIMO (2Tx), Ant1+Ant2 Directional gain = GANT + 10 log(N) dBi = 1.6 + 10 log(2) = 4.6 dBi < 6 dBi.

### 4.4 Measured data of Power Spectrum Density test results

The more detail please refer to "Appendix of 210810028SZN-004" Appendix C.

## **5. Minimum 6 dB RF Bandwidth (FCC 15.407)**

### **5.1 Operating environment**

Temperature: 25 °C  
Relative Humidity: 50 %  
Atmospheric Pressure: 1011 hPa

### **5.2 Test setup & procedure**

The Minimum 6 dB RF Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100KHz, and set the video bandwidth (VBW)  $\geq 3 \times$  RBW. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

#### **For 26dB down Emission Bandwidth**

The 26dB down Emission Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set RBW = approximately 1% of the emission bandwidth. Set the VBW > RBW, Detector = Peak, Trace mode = max hold (Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%).

#### **For 99% Occupied Bandwidth**

The 99% Occupied Bandwidth per 789033 D02 was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set center frequency to the nominal EUT channel center frequency, set span = 1.5 times to 5.0 times the OBW, set RBW = 1 % to 5 % of the OBW, set VBW  $\geq 3 \times$  RBW, The 99% occupied bandwidth was determined from where the channel output spectrum intersected the display line.

### 5.3 Limit

| Operating Frequency (MHz) | Minimum 6 dB RF Bandwidth Limit |
|---------------------------|---------------------------------|
| 5150~5250                 | N/A                             |
| 5250~5350                 | N/A                             |
| 5470~5725                 | N/A                             |
| 5725~ 5850                | ≥500KHz                         |

### 5.4 Measured data of 6dB down Emission Bandwidth test results

The more detail please refer to “Appendix of 210810028SZN-004” Appendix A3.

Note: 99% Occupied Bandwidth within the U-NII-1 band and 26dB Emission Bandwidth for reference. The more detail please refer to “Appendix of 210810028SZN-004” Appendix A2 and Appendix A1.

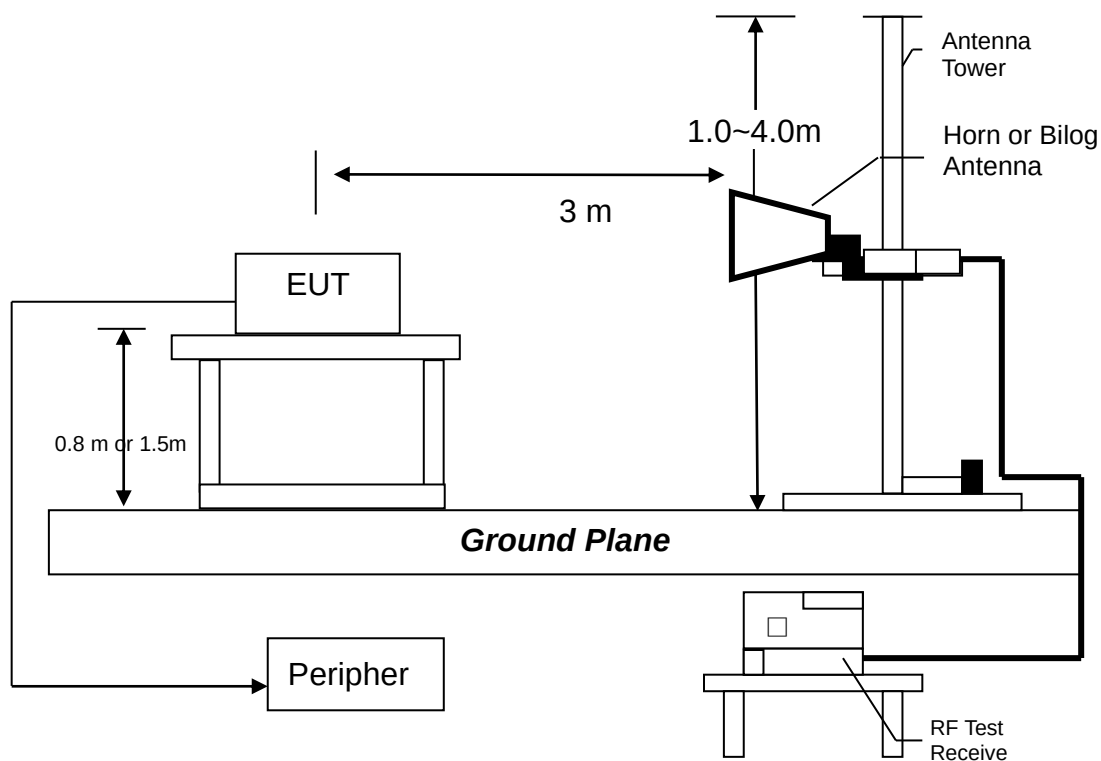
## 6. Radiated Emission test (FCC 15.205 & 15.209 & 15.407)

### 6.1 Operating environment

|                      |      |     |
|----------------------|------|-----|
| Temperature:         | 23   | °C  |
| Relative Humidity:   | 56   | %   |
| Atmospheric Pressure | 1011 | hPa |

### 6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 9KHz to tenth harmonic or 40GHz.

The EUT for testing is arranged on a styrene turntable with the height of 0.8m up to 1GHz and 1.5m above 1GHz. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Testing settings (refer to KDB 789033 D02)

Peak Measurements below 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=120KHz
- 4, Detector=Quasi-Peak
- 5, Trace was allowed to stabilize

Peak Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= Peak (Max-hold)
- 5, Trace was allowed to stabilize

Average Measurements above 1GHz

- 1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
- 2, Span=encompass the entire emission
- 3, RBW=1MHz
- 4, VBW=3MHz
- 4, Detector= RMS (Max-hold)
- 5, Trace was allowed to stabilize

### 6.3 Limit

The spurious Emission shall test through the 10th harmonic or 40GHz (whichever is lower). In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

#### Notes:

- 1, All emission out-side of the 5.15-5.35GHz & 5.47-5.725GHz band shall not exceed an EIRP of -27dBm/MHz (68.2dBuV/m, test distance: 3 meter), For the band 5.725-5.85GHz, all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- 2, The spectrum is measured from 9KHz to the 10th harmonic of the fundamental frequency of the transmitter using QP detector below 1GHz, above 1GHz, average & peak measurements were taken using for test. The worst-case emission are reported however emission whose levels were not within 20dB of the respective limited were not reported.
- 3, Simultaneous transmitting was considered during the testing. All mode had been tested, but only the worst-case is recorded in the following graph and table.



## Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB/m
- AG = Amplifier Gain in dB
- PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

### Example

Assume a receiver reading of 62.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB/m} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm } [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

## 6.4 Radiated spurious emission test data

### 6.4.1 Measurement results: frequencies equal to or less than 1 GHz

Applicant: Echelon Fitness Multimedia LLC

Date of Test: 26 August 2021

Model: ECHKIN24-3399-C

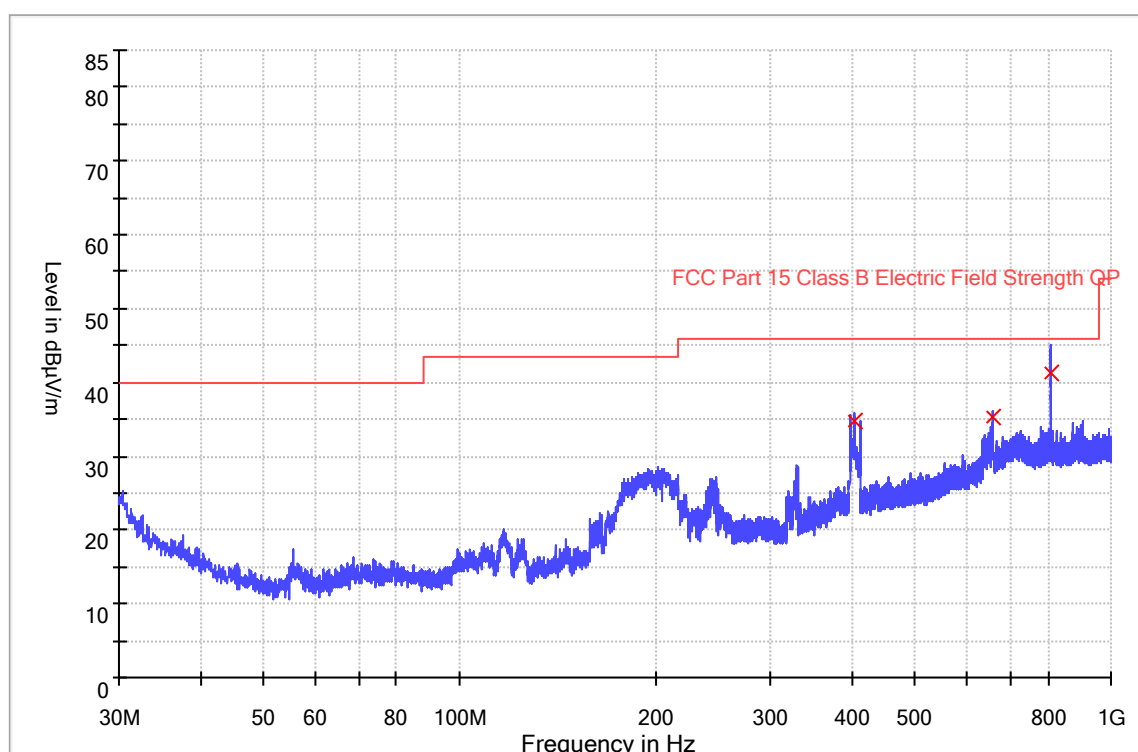
Worst Case Operating Mode:

Simultaneous transmission

## Radiated Emissions

ANT Polarity: Horizontal

FCC Part 15



| Frequency (MHz) | QuasiPeak (dBuV/m) | Meas. Time (ms) | Bandwidth (kHz) | Polarization | Corr. (dB/m) | Margin - QPK (dB) | Limit - QPK (dBuV/m) |
|-----------------|--------------------|-----------------|-----------------|--------------|--------------|-------------------|----------------------|
| 404.129000      | 34.8               | 1000.0          | 120.000         | H            | 25.2         | 11.2              | 46.0                 |
| 659.724000      | 35.2               | 1000.0          | 120.000         | H            | 30.6         | 10.8              | 46.0                 |
| 808.392667      | 41.2               | 1000.0          | 120.000         | H            | 32.0         | 4.8               | 46.0                 |

#### NOTES:

1. Quasi-Peak detector is used for frequency below 1GHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

Applicant: Echelon Fitness Multimedia LLC

Date of Test: 26 August 2021

Worst Case Operating Mode:

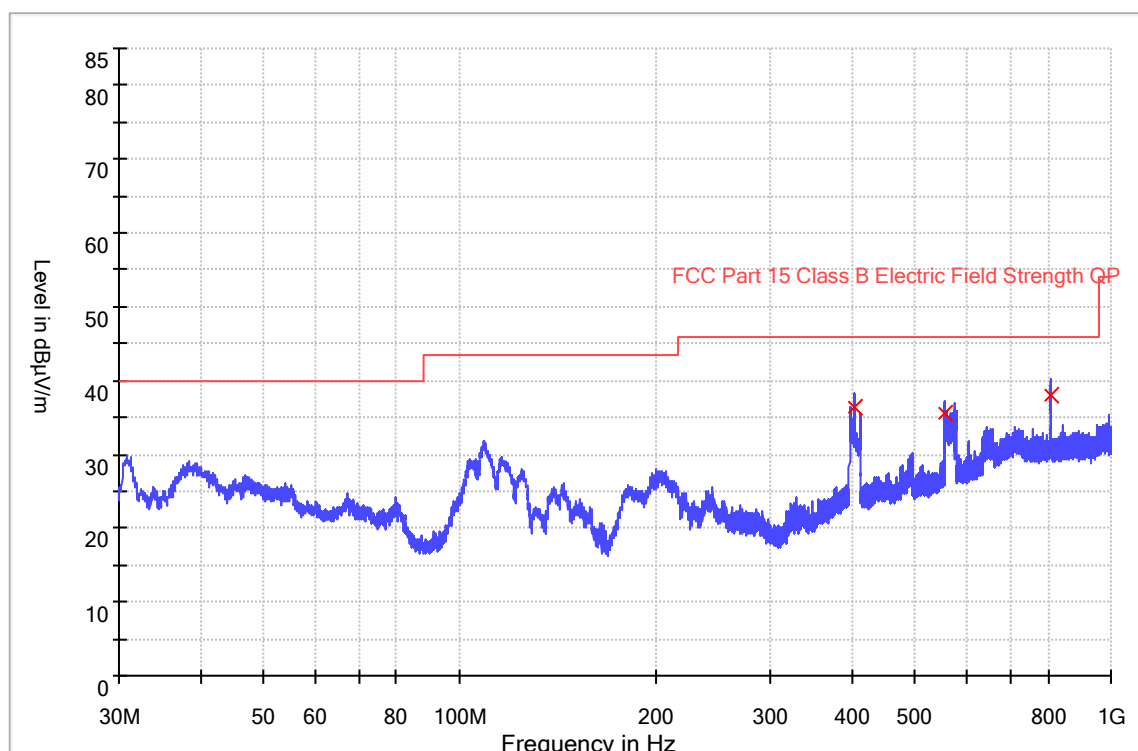
Model: ECHKIN24-3399-C

Simultaneous transmission

## Radiated Emissions

ANT Polarity: Vertical

FCC Part 15



| Frequency (MHz) | QuasiPeak (dBuV/m) | Meas. Time (ms) | Bandwidth (kHz) | Polarization | Corr. (dB/m) | Margin - QPK (dB) | Limit - QPK (dBuV/m) |
|-----------------|--------------------|-----------------|-----------------|--------------|--------------|-------------------|----------------------|
| 404.420000      | 36.4               | 1000.0          | 120.000         | V            | 25.2         | 9.6               | 46.0                 |
| 556.871667      | 35.6               | 1000.0          | 120.000         | V            | 27.7         | 10.4              | 46.0                 |
| 808.134000      | 38.0               | 1000.0          | 120.000         | V            | 32.0         | 8.0               | 46.0                 |

### NOTES:

1. Quasi-Peak detector is used for frequency below 1GHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

## 6.4.2 Measurement results: frequency above 1GHz

The worst case occurred at 802.11n-HT40 MIMO

### Channel 38/27 Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10380.000       | 54.6           | 36.3              | 38.9                | 57.2               | 68.2                      | -11.0       |
| Horizontal   | 15570.000       | 50.0           | 34.7              | 41.0                | 56.3               | 68.2                      | -11.9       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10380.000       | 39.5           | 36.3              | 38.9                | 42.1               | 54.0                         | -11.9       |
| Horizontal   | 15570.000       | 36.9           | 34.7              | 41.0                | 43.2               | 54.0                         | -10.8       |

### Channel 46/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10460.000       | 52.3           | 36.3              | 38.9                | 54.9               | 68.2                      | -13.3       |
| Horizontal   | 15690.000       | 49.4           | 34.7              | 41.0                | 55.7               | 68.2                      | -12.5       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10460.000       | 38.7           | 36.3              | 38.9                | 41.3               | 54.0                         | -12.7       |
| Horizontal   | 15690.000       | 36.8           | 34.7              | 41.0                | 43.1               | 54.0                         | -10.9       |

### Channel 54/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10540.000       | 53.5           | 36.3              | 38.9                | 56.1               | 68.2                      | -12.1       |
| Horizontal   | 15810.000       | 50.7           | 34.7              | 41.0                | 57.0               | 68.2                      | -11.2       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10540.000       | 38.6           | 36.3              | 38.9                | 41.2               | 54.0                         | -12.8       |
| Horizontal   | 15810.000       | 36.9           | 34.7              | 41.0                | 43.2               | 54.0                         | -10.8       |

### Channel 62/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 10620.000       | 50.1           | 36.3              | 38.9                | 52.7               | 68.2                      | -15.5       |
| Horizontal   | 15930.000       | 48.0           | 34.7              | 41.0                | 54.3               | 68.2                      | -13.9       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 10620.000       | 36.7           | 36.3              | 38.9                | 39.3               | 54.0                         | -14.7       |
| Horizontal   | 15930.000       | 35.3           | 34.7              | 41.0                | 41.6               | 54.0                         | -12.4       |

### Channel 102/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11020.000       | 51.0           | 36.3              | 38.9                | 53.6               | 68.2                      | -14.6       |
| Horizontal   | 16530.000       | 49.9           | 34.7              | 41.0                | 56.2               | 68.2                      | -12.0       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11020.000       | 38.6           | 36.3              | 38.9                | 41.2               | 54.0                         | -12.8       |
| Horizontal   | 16530.000       | 36.9           | 34.7              | 41.0                | 43.2               | 54.0                         | -10.8       |

### Channel 110/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11100.000       | 49.5           | 36.3              | 38.9                | 52.1               | 68.2                      | -16.1       |
| Horizontal   | 16650.000       | 48.5           | 34.7              | 41.0                | 54.8               | 68.2                      | -13.4       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11100.000       | 40.3           | 36.3              | 38.9                | 42.9               | 54.0                         | -11.1       |
| Horizontal   | 16650.000       | 38.8           | 34.7              | 41.0                | 45.1               | 54.0                         | -8.9        |

### Channel 134/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11340.000       | 50.1           | 36.3              | 39.0                | 52.8               | 68.2                      | -15.4       |
| Horizontal   | 17010.000       | 48.7           | 34.7              | 41.2                | 55.2               | 68.2                      | -13.0       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11340.000       | 40.5           | 36.3              | 39.0                | 43.2               | 54.0                         | -10.8       |
| Horizontal   | 17010.000       | 35.6           | 34.7              | 41.2                | 42.1               | 54.0                         | -11.9       |

### Channel 151/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11510.000       | 50.3           | 36.3              | 39.0                | 53.0               | 68.2                      | -15.2       |
| Horizontal   | 17265.000       | 49.1           | 34.7              | 41.2                | 55.6               | 68.2                      | -12.6       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11510.000       | 39.0           | 36.3              | 39.0                | 41.7               | 54.0                         | -12.3       |
| Horizontal   | 17265.000       | 37.4           | 34.7              | 41.2                | 43.9               | 54.0                         | -10.1       |

### Channel 159/27Mbps

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Peak Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|---------------------------|-------------|
| Horizontal   | 11590.000       | 51.7           | 36.3              | 39.0                | 54.4               | 68.2                      | -13.8       |
| Horizontal   | 17385.000       | 43.8           | 34.7              | 41.2                | 50.3               | 68.2                      | -17.9       |

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Average Limit at 3m (dBμV/m) | Margin (dB) |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|------------------------------|-------------|
| Horizontal   | 11590.000       | 38.3           | 36.3              | 39.0                | 41.0               | 54.0                         | -13.0       |
| Horizontal   | 17385.000       | 36.7           | 34.7              | 41.2                | 43.2               | 54.0                         | -10.8       |

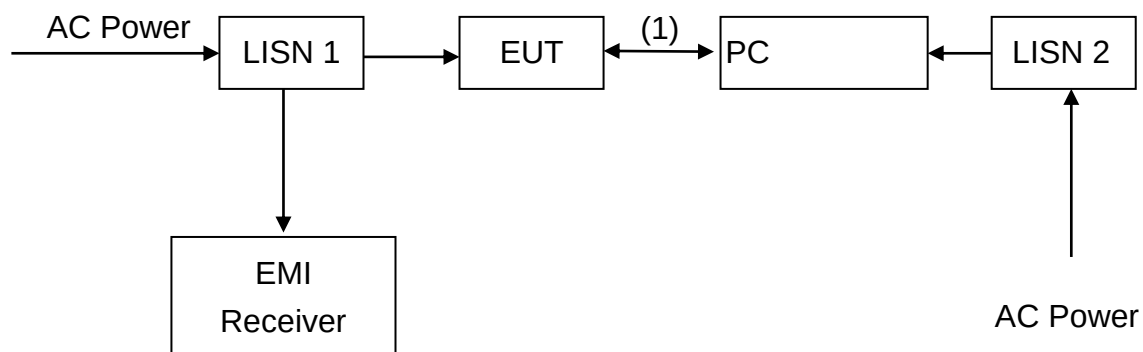
- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function. All unwanted emissions outside of the 5.15-5.35GHz & 5.47-5.725GHz & 5725-5850 bands are complied with the limit.

## 7. Power Line Conducted Emission test

### 7.1 Operating environment

Temperature: 23 °C  
Relative Humidity: 55 %  
Atmospheric Pressure 1011 hPa

### 7.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/50 uH coupling impedance with 50 ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10/2013 on conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESCI 30) is set at 9 kHz.

### 7.3 Limit

| Frequency (MHz) | Conducted Limit (dBUV) |          |
|-----------------|------------------------|----------|
|                 | Q.P.                   | Ave.     |
| 0.15~0.50       | 66 – 56*               | 56 – 46* |
| 0.50~5.00       | 56                     | 46       |
| 5.00~30.0       | 60                     | 50       |

\*Decreases with the logarithm of the frequency.

## 7.4 Power Line Conducted Emission test data

Applicant: Echelon Fitness Multimedia LLC

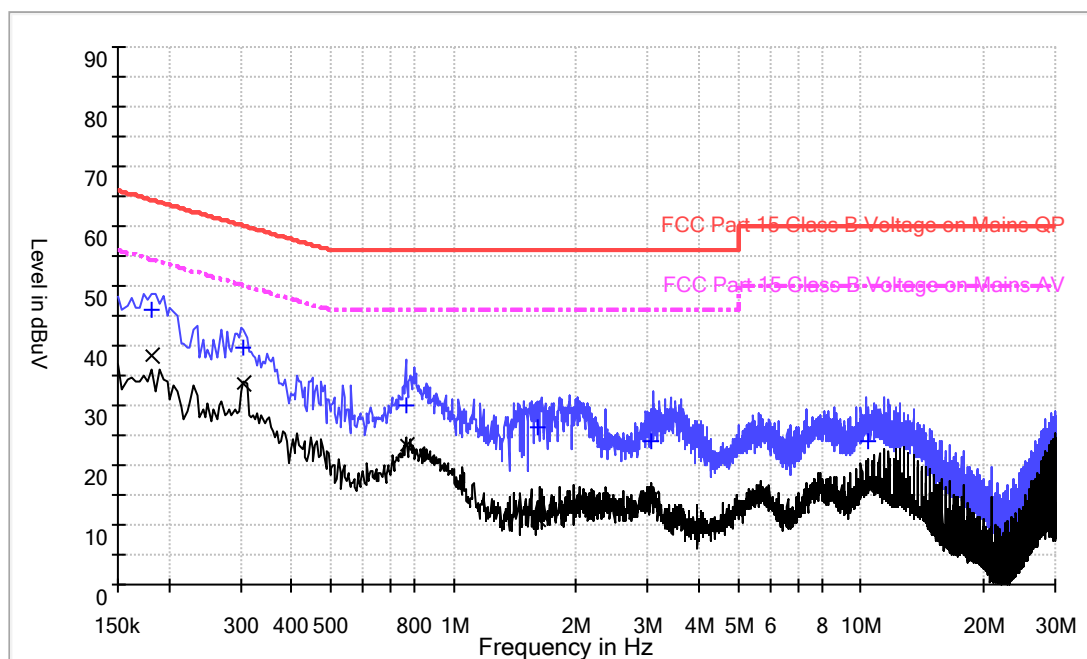
Date of Test: 28 September 2021

Worst Case Operating Mode:

Phase: Live

Model: ECHKIN24-3399-C

Simultaneous transmission



### Limit and Margin QP

| Frequency (MHz) | QuasiPeak (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.182000        | 46.1             | 9.000           | L1   | 9.6        | 18.3        | 64.4         |
| 0.306000        | 39.7             | 9.000           | L1   | 9.6        | 20.4        | 60.1         |
| 0.766000        | 29.9             | 9.000           | L1   | 9.6        | 26.1        | 56.0         |
| 1.602000        | 26.2             | 9.000           | L1   | 9.6        | 29.8        | 56.0         |
| 3.050000        | 23.9             | 9.000           | L1   | 9.7        | 32.1        | 56.0         |
| 10.378000       | 24.1             | 9.000           | L1   | 9.8        | 35.9        | 60.0         |

### Limit and Margin AV

| Frequency (MHz) | Average (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.182000        | 38.5           | 9.000           | L1   | 9.6        | 15.9        | 54.4         |
| 0.306000        | 33.6           | 9.000           | L1   | 9.6        | 16.5        | 50.1         |
| 0.766000        | 23.2           | 9.000           | L1   | 9.6        | 22.8        | 46.0         |
| 1.602000        | 11.1           | 9.000           | L1   | 9.6        | 34.9        | 46.0         |
| 3.050000        | 14.4           | 9.000           | L1   | 9.7        | 31.6        | 46.0         |
| 10.378000       | 16.4           | 9.000           | L1   | 9.8        | 33.6        | 50.0         |

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dBuV) – Level (dBuV)



Applicant: Echelon Fitness Multimedia LLC

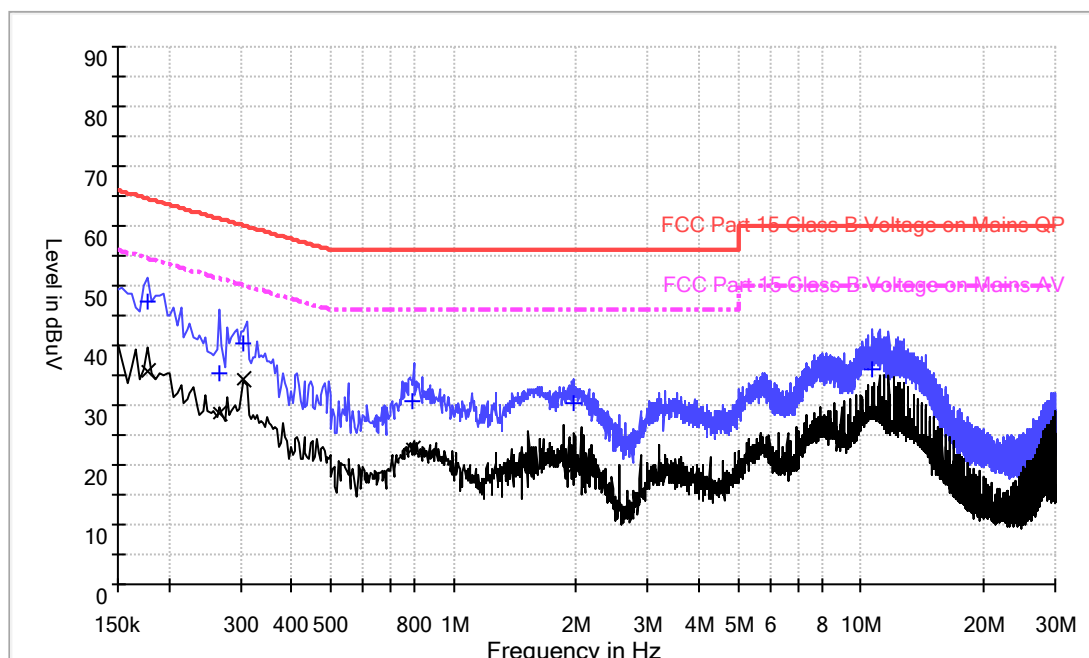
Date of Test: 28 September 2021

Worst Case Operating Mode:

Phase: Neutral

Model: ECHKIN24-3399-C

Simultaneous transmission



## Limit and Margin QP

| Frequency (MHz) | QuasiPeak (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.178000        | 47.3             | 9.000           | N    | 9.5        | 17.3        | 64.6         |
| 0.266000        | 35.3             | 9.000           | N    | 9.5        | 25.9        | 61.2         |
| 0.306000        | 40.4             | 9.000           | N    | 9.5        | 19.7        | 60.1         |
| 0.794000        | 30.8             | 9.000           | N    | 9.5        | 25.2        | 56.0         |
| 1.978000        | 30.3             | 9.000           | N    | 9.5        | 25.7        | 56.0         |
| 10.706000       | 36.0             | 9.000           | N    | 9.7        | 24.0        | 60.0         |

## Limit and Margin AV

| Frequency (MHz) | Average (dBuV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBuV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.178000        | 35.5           | 9.000           | N    | 9.5        | 19.1        | 54.6         |
| 0.266000        | 28.7           | 9.000           | N    | 9.5        | 22.5        | 51.2         |
| 0.306000        | 34.2           | 9.000           | N    | 9.5        | 15.9        | 50.1         |
| 0.794000        | 22.6           | 9.000           | N    | 9.5        | 23.4        | 46.0         |
| 1.978000        | 19.7           | 9.000           | N    | 9.5        | 26.3        | 46.0         |
| 10.706000       | 28.4           | 9.000           | N    | 9.7        | 21.6        | 50.0         |

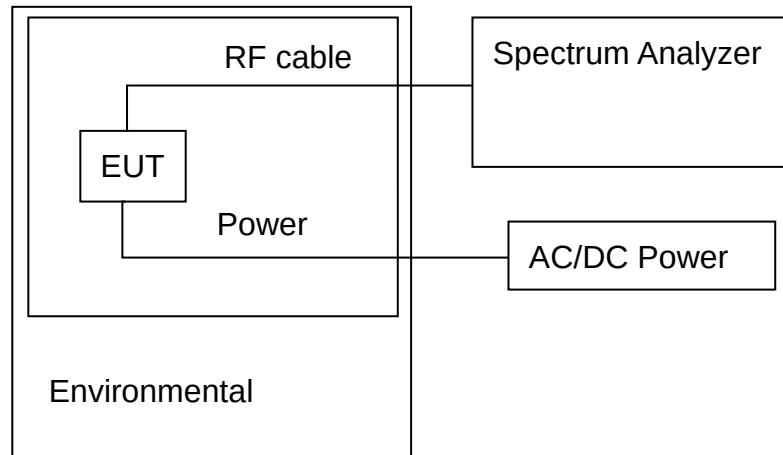
Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dBuV) – Level (dBuV)

## 8. Frequency Stability Test

### 8.1 Test setup & procedure



Note1: The frequency stability is measured with the temperature variation range of 0°C to +40°C, and voltage supply variation range of 85% to 115% of nominal AC supply voltage.

Note2: To ensure emission at the band-edge is maintained within the authorized band, the frequency 802.11a/n-HT20/n-HT 40 channel 36, 48, 52, 64, 100, 140, 149, 165, 38, 46, 54, 62, 102, 134, 151, 159 are selected to test and the worst case was reported.

### 8.2 Frequency Stability Test Data

20°C is taken as temperature in normal condition (NT).

120VAC is normal voltage (NV)

102VAC is low voltage (LV)

138VAC is high voltage (HV)

The more detail please refer to “Appendix of 210810028SZN-004” Appendix D.

Note: All emissions are maintained within the band of operation under all conditions of normal operation as specified in the user manual. It fulfills the requirement of 15.407(g).

## 9. Dynamic Frequency Selection (DFS) (FCC 15.407)

### 9.1 Requirement

#### Applicability of DFS Requirements Prior to Use of a Channel

| Requirement                     | Operational Mode |                                |                             |
|---------------------------------|------------------|--------------------------------|-----------------------------|
|                                 | Master           | Client Without Radar Detection | Client With Radar Detection |
| Non-Occupancy Period            | Yes              | Not Required                   | Yes                         |
| DFS Detection Threshold         | Yes              | Not Required                   | Yes                         |
| Channel Availability Check Time | Yes              | Not Required                   | Not Required                |
| U-NII Detection Bandwidth       | Yes              | Not Required                   | Yes                         |

#### Applicability of DFS requirements during normal operation

| Requirement                       | Operational Mode                             |                                |
|-----------------------------------|----------------------------------------------|--------------------------------|
|                                   | Master Device or Client with Radar Detection | Client Without Radar Detection |
| DFS Detection Threshold           | Yes                                          | Not Required                   |
| Channel Closing Transmission Time | Yes                                          | Yes                            |
| Channel Move Time                 | Yes                                          | Yes                            |
| U-NII Detection Bandwidth         | Yes                                          | Not Required                   |

| Additional requirements for devices with multiple bandwidth modes | Master Device or Client with Radar Detection | Client Without Radar Detection                       |
|-------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------|
| U-NII Detection Bandwidth and Statistical Performance Check       | All BW modes must be tested                  | Not required                                         |
| Channel Move Time and Channel Closing Transmission Time           | Test using widest BW mode available          | Test using the widest BW mode available for the link |
| All other tests                                                   | Any single BW mode                           | Not required                                         |

**Note:** Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

Note: EUT is a client without DFS detection capabilities.

### 9.1.1 DFS Detection Thresholds for Master or Client Devices with DFS Detection

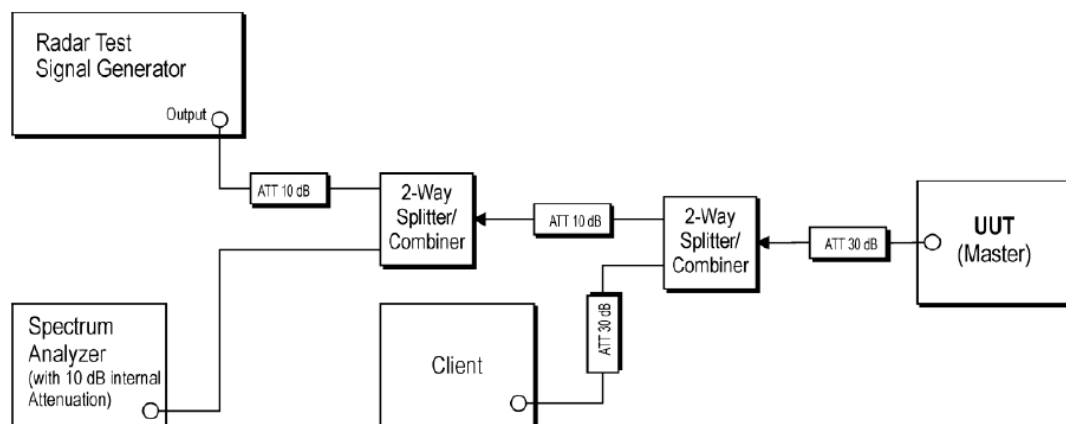
| Maximum Transmit Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Values (See Notes 1, 2, and 3) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| EIRP $\geq$ 200 milliwatt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -64 dBm                        |
| EIRP $<$ 200 milliwatt and power spectral density $<$ 10 dBm/MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -62 dBm                        |
| EIRP $<$ 200 milliwatt that do not meet the power spectral density requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -64 dBm                        |
| <p><b>Note 1:</b> This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p><b>Note 2:</b> Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.</p> <p><b>Note 3:</b> EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.</p> |                                |

| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Value                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Non-Occupancy Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Minimum 30 minutes                                                                 |
| Channel Availability Check Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 60 Seconds                                                                         |
| Channel Move Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10 seconds (see note 1)                                                            |
| Channel Closing Transmission Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 200 ms + an aggregate of 60 ms over remaining 10 Second period. (see note 1 and 2) |
| U-NII Detection Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Minimum 100% of the U-NII 99% transmission power bandwidth. (see note 3)           |
| <p><b>Note 1:</b> Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p><b>Note 2:</b> The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.</p> <p><b>Note 3:</b> During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p> |                                                                                    |

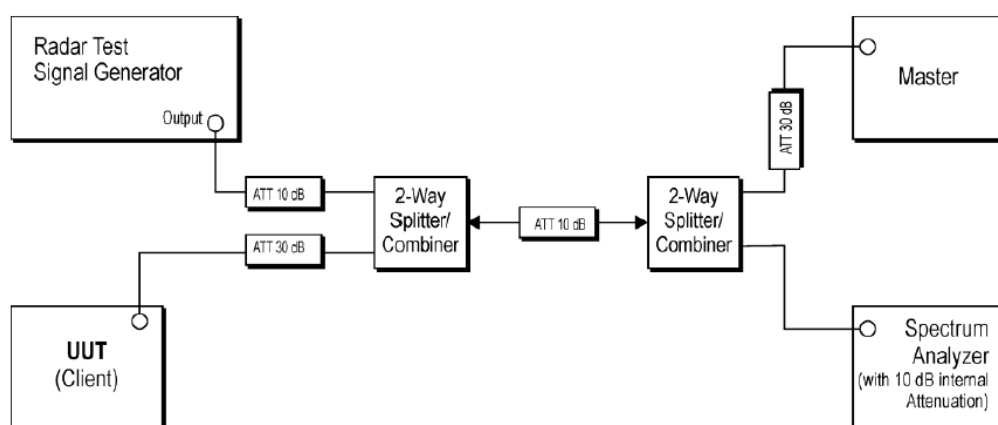
### 9.1.2 Radar Test Waveforms

Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02, for more radar test waveform details please refer section 6 of KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02.

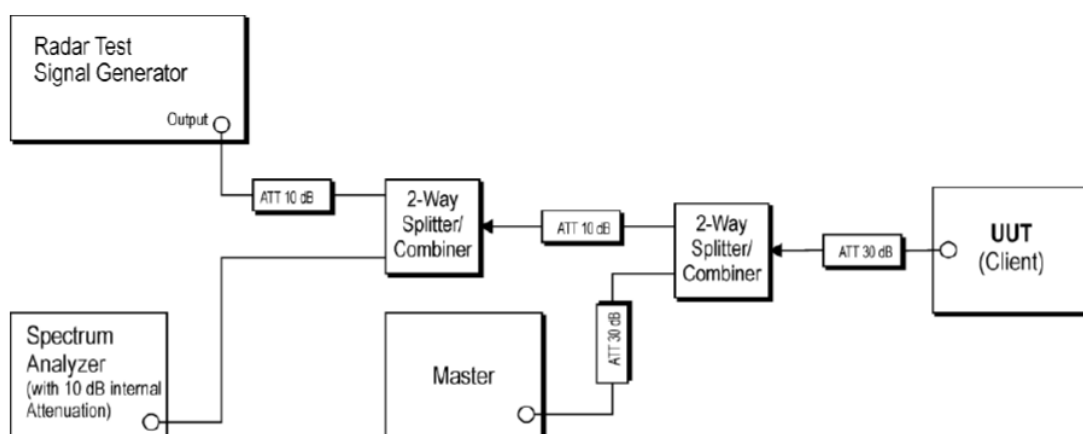
## 9.2 Test setup



Setup for Master with injection at the Master



Setup for Client with injection at the Master



Setup for Client with injection at the Client

Note: EUT is a client without DFS detection capabilities. Test procedures were made in accordance to KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02. DFS testing was setup as a client with injection into the master.

### **9.3 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non- Occupancy Period**

#### **9.3.1 Test Procedure**

The EUT was configured to communicate with a master device. The test file was streamed from the Master to the Client (EUT) on the selected test channel. Measurements were made while utilizing the widest bandwidth of the EUT.

Channel closing transmission time and channel move time were measured by applying a radar type 0 at threshold + 1dB to the EUT. The EUT transmissions were observed on the EUT center channel. The time between the end of the applied radar waveform and the final transmission on the channel is the channel move time. The channel closing transmission time comprises only those fragments of the channel move time during which the EUT transmits.

The Channel Move time shall be less than 10 seconds

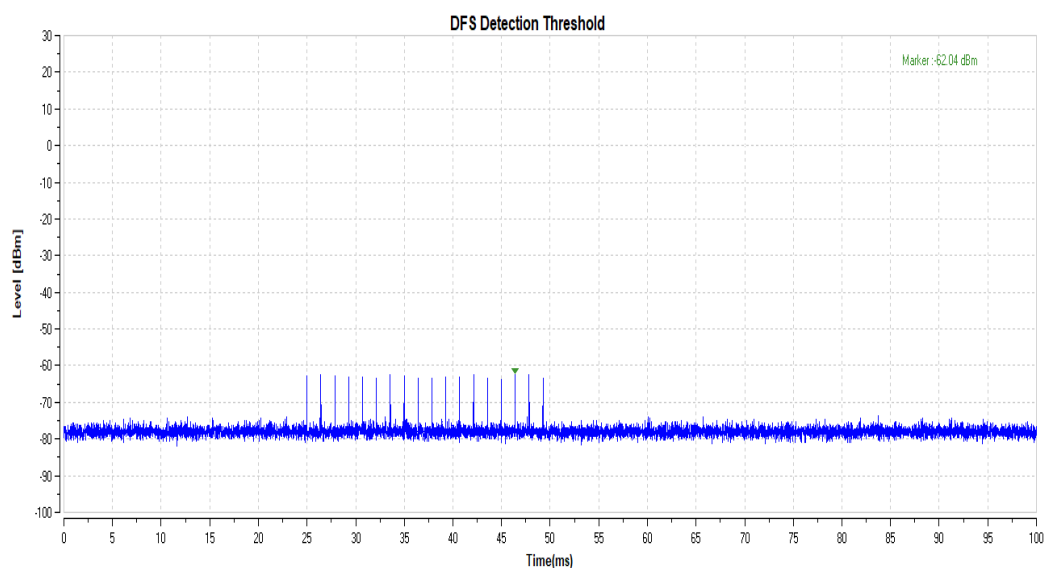
The Channel Close time shall be 200ms +60ms of aggregate time.

The Non-occupancy time shall 30 minutes or greater.

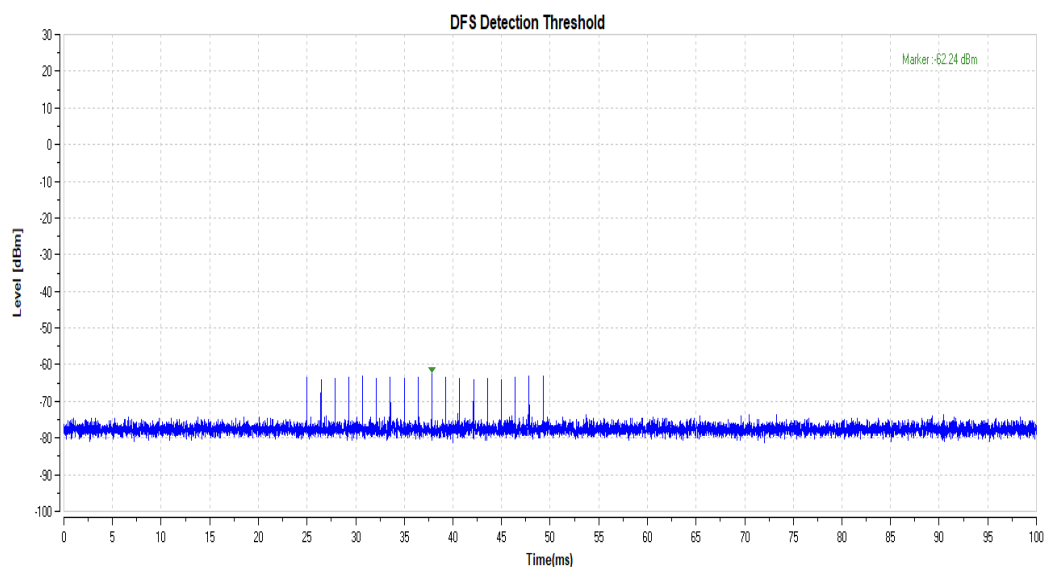
### 9.3.2 Calibration Results

Radar Type 0 Calibration:

| Frequency | Radar Waveform Length: | Detection Threshold level |
|-----------|------------------------|---------------------------|
| 5290MHz   | 0.025704s              | -62.04dBm                 |



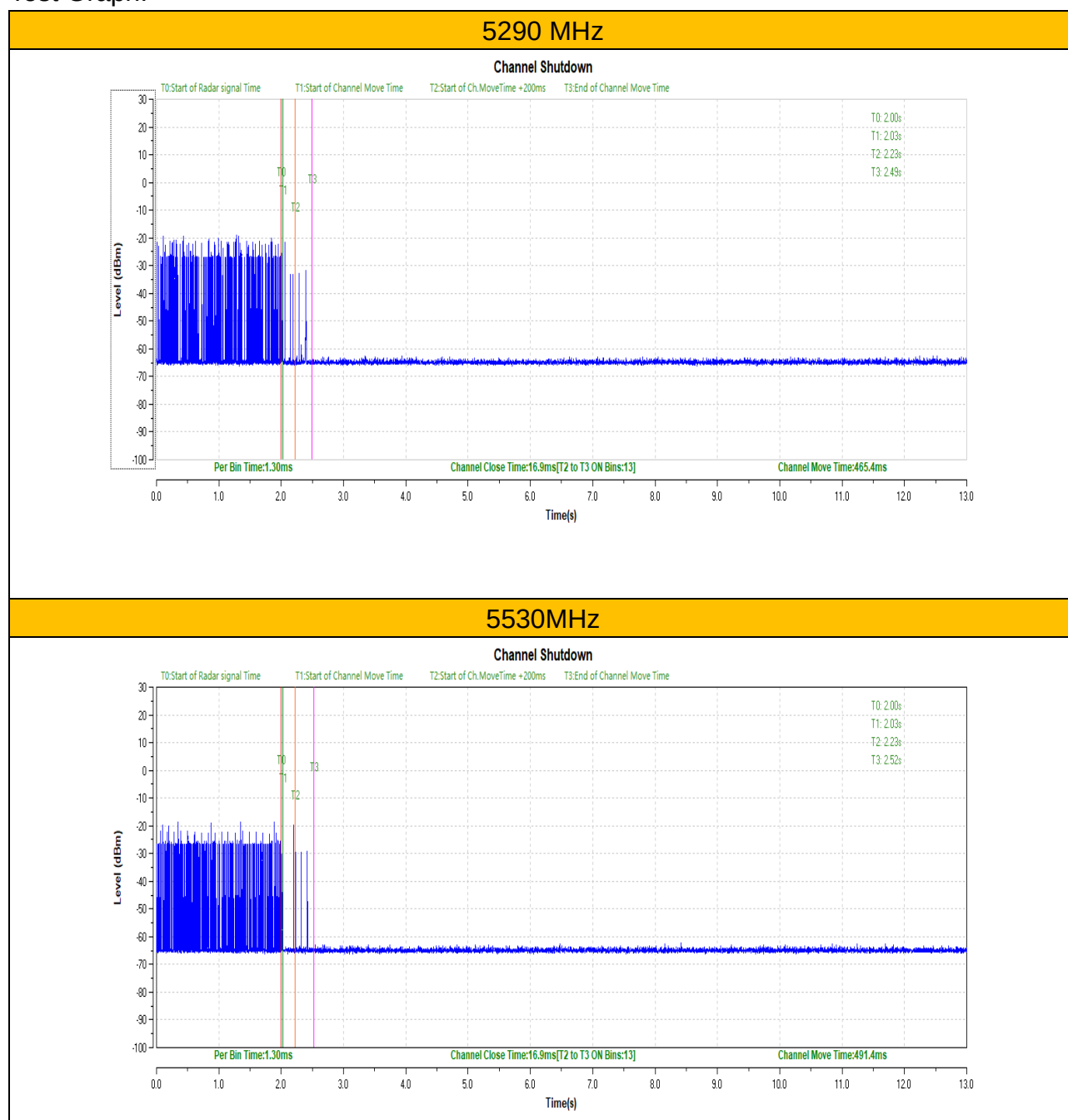
| Frequency | Radar Waveform Length: | Detection Threshold level |
|-----------|------------------------|---------------------------|
| 5530MHz   | 0.025704s              | -62.24 dBm                |



### 9.3.3 Channel Move time and Channel Closing Transmission Time Test Results

| Frequency | Bandwidth | Channel Move Time [ms] | Limit [ms] | Channel Closing Transmission [ms] | Limit [ms] | Verdict |
|-----------|-----------|------------------------|------------|-----------------------------------|------------|---------|
| 5290      | 80 MHz    | 464.4                  | 10000      | 16.9                              | 260        | PASS    |
| 5530      | 80 MHz    | 492.1                  | 10000      | 16.9                              | 260        | PASS    |

#### Test Graph:

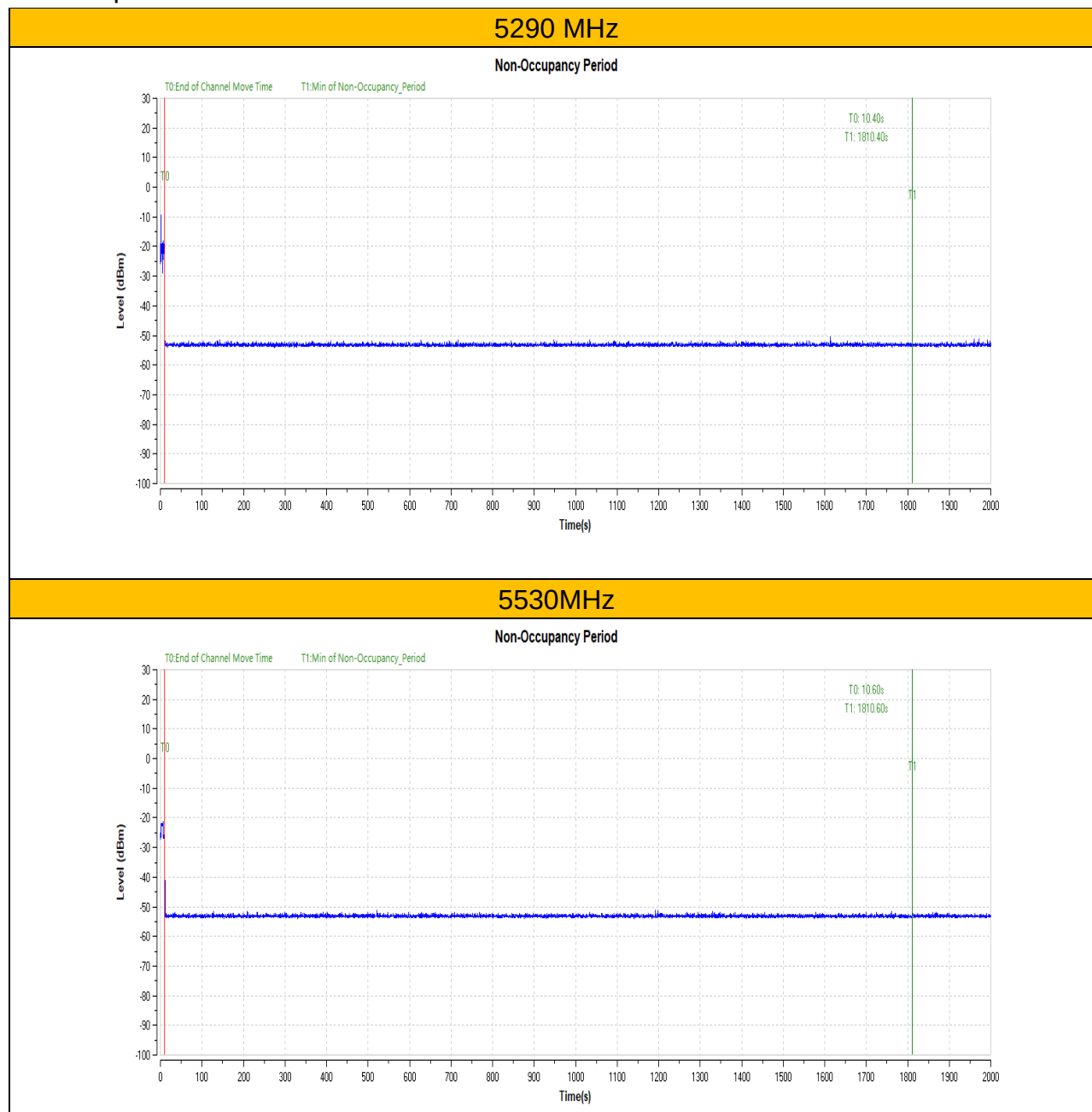




### 9.3.4 Non-Occupancy Period Test Results

| Frequency | Bandwidth | Measured Value | Limit Requirements | Verdict |
|-----------|-----------|----------------|--------------------|---------|
| 5290      | 80 MHz    | > 30min        | 30min              | Pass    |
| 5530      | 80 MHz    | > 30min        | 30min              | Pass    |

#### Test Graph:



## Appendix A: Test equipment list

| Equipment No. | Equipment                                                                  | Manufacturer    | Model No.    | Serial No. | Cal. Date  | Due Date   |
|---------------|----------------------------------------------------------------------------|-----------------|--------------|------------|------------|------------|
| SZ182-02      | RF Power Meter                                                             | Anritsu         | ML2496A      | 1302005    | 2021-05-10 | 2022-05-10 |
| SZ182-02-01   | Pulse Power Sensor                                                         | Anritsu         | MA2411B      | 1207429    | 2021-05-10 | 2022-05-10 |
| SZ070-24      | Open Switch and Control Unit with TS8997 option for power measurement test | R&S             | OSP120+B157  | ---        | 2020-12-22 | 2021-12-22 |
| SZ070-20      | Combiner                                                                   | Mini-Circuits   | ZN2PD-63-S+  | ---        | 2021-05-11 | 2022-05-11 |
| SZ070-21      | Combiner                                                                   | Mini-Circuits   | ZN2PD-63-S+  | ---        | 2021-05-11 | 2022-05-11 |
| SZ056-05      | Spectrum Analyzer                                                          | Agilent         | E4407B       | US40522113 | 2020-12-22 | 2021-12-22 |
| SZ180-13      | MXG Vector Signal Generator                                                | Keysight        | N5182B       | MY53051328 | 2020-10-17 | 2021-10-17 |
| SZ061-13      | BiConiLog Antenna                                                          | ETS             | 3142E        | 00217919   | 2019-06-10 | 2022-06-10 |
| SZ061-06      | Active Loop Antenna                                                        | Electro-Metrics | EM-6876      | 217        | 2021-05-18 | 2023-05-18 |
| SZ061-09      | Horn Antenna                                                               | ETS             | 3115         | 00092346   | 2020-10-17 | 2022-10-17 |
| SZ061-07      | Pyramidal Horn Antenna                                                     | ETS             | 3160-09      | 00083067   | 2019-08-13 | 2022-08-13 |
| SZ185-01      | EMI Receiver                                                               | R&S             | ESCI         | 100547     | 2020-12-22 | 2021-12-22 |
| SZ056-07      | Signal Analyzer                                                            | R&S             | FSV40        | 101214     | 2020-10-17 | 2021-10-17 |
| SZ181-04      | Preamplifier                                                               | Agilent         | 8449B        | 3008A02474 | 2021-05-10 | 2022-05-10 |
| SZ188-01      | Anechoic Chamber                                                           | ETS             | RFD-F/A-100  | 4102       | 2018-12-15 | 2021-12-15 |
| SZ062-02      | RF Cable                                                                   | RADIALL         | RG 213U      | --         | 2021-06-01 | 2021-12-01 |
| SZ062-05      | RF Cable                                                                   | RADIALL         | 0.04-26.5GHz | --         | 2021-06-01 | 2021-12-01 |
| SZ062-12      | RF Cable                                                                   | RADIALL         | 0.04-26.5GHz | --         | 2021-06-01 | 2021-12-01 |
| SZ067-25      | Notch Filter                                                               | Micro-Tronics   | BRM50716     | --         | 2021-03-23 | 2022-03-23 |
| SZ067-04      | Notch Filter                                                               | Micro-Tronics   | BRM50702-02  | --         | 2021-05-11 | 2022-05-11 |
| SZ185-02      | EMI Test Receiver                                                          | R&S             | ESCI         | 100692     | 2020-10-17 | 2021-10-17 |
| SZ187-01      | Two-Line V-Network                                                         | R&S             | ENV216       | 100072     | 2020-10-17 | 2021-10-17 |
| SZ187-02      | Two-Line V-Network                                                         | R&S             | ENV216       | 100073     | 2021-05-12 | 2022-05-12 |
| SZ188-03      | Shielding Room                                                             | ETS             | RFD-100      | 4100       | 2020-01-07 | 2023-01-07 |
| SZ016-12      | Programmable Temperature & Humidity Chamber                                | Taili           | MHK-120NK    | AB0105     | 2021-01-12 | 2022-01-12 |

Expanded uncertainty of radiated emission measurement is  $\pm 4.9$  dB.

Expanded uncertainty of conducted emission measurement is  $\pm 3.6$  dB.

\*\*\*\*\* End of Report\*\*\*\*\*