# RF TEST REPORT

## FCC ID: 2A5DZ-CT-LBWES

| | |
|---|---|
| Test Report No……..: | RF260901001-01-003 |
| Product(s) Name……..: | HHOLOVE Automatic Cat Litter Box Ease |
| Model(s)……..: | CT-LBWES, CT-LBWES-WB |
| Trade Mark……...: | HHOLOVE, ABRCT |
| Applicant……..: | HHO (Hangzhou) Digital Technology Co., Ltd. |
| Address……..: | Building 9, Haizhi Center, Cangqian Street, Yuhang District, Hangzhou City, Zhejiang Province, China |
| Receipt Date……..: | 2026.09.03 |
| Test Date……...: | 2026.09.04 ~ 2026.09.14 |
| Issued Date……..: | 2026.09.14 |
| Standards……..: | 47 CFR FCC Part 15, Subpart C(Section 15.247)<br>ANSI C63.10-2020+Cor. 1-2023 |
| Testing Laboratory……: | Shenzhen Haiyun Standard Technical Co., Ltd. |

| Prepared By: | Checked By: | Approved By: | |
|---|---|---|---|
| Lemon He | Black Ding | Tim Zhang | |
| Lemon He | Black Ding | Tim.zhang | |

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## HISTORY OF THIS TEST REPORT

Original Report Issue Date: 2026.09.14

● No additional attachment

○ Additional attachments were issued following record

| Attachment No. | Issue Date | Description |
|---|---|---|
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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC CFR Title 47, Part 15, Subpart C | | | | |
|---|---|---|---|---|
| **Standard(s) Section** | **Test Item** | **Test Result** | **Judgment** | **Remark** |
| 15.207 | AC Power Line Conducted Emissions | APPENDIX A | PASS | ------ |
| 15.247(d)<br>15.205(a)<br>15.209(a) | Radiated Emission | APPENDIX B<br>APPENDIX C<br>APPENDIX D | PASS | ------ |
| 15.247<br>(a)(1)(iii) | Number of Hopping Frequency | APPENDIX E | PASS | ------ |
| 15.247<br>(a)(1)(iii) | Average Time of Occupancy | APPENDIX F | PASS | ------ |
| 15.247(a)(1) | Hopping Channel Separation | APPENDIX G | PASS | ------ |
| 15.247(a)(1) | Bandwidth | APPENDIX H | PASS | ------ |
| 15.247(a)(1) | Maximum Output Power | APPENDIX I | PASS | ------ |
| 15.247(d) | Conducted Spurious Emission | APPENDIX J | PASS | ------ |
| 15.203 | Antenna Requirement | ------ | PASS | Note(2) |

Note:

(1) “N/A” denotes test is not applicable in this test report

(2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 1.1 TEST FACILITY

| | |
|---|---|
| Company: | Shenzhen Haiyun Standard Technical Co., Ltd. |
| Address: | No. 110-113, 115, 116, Block B, Jinyuan Business Building, Bao'an District, Shenzhen, China |
| CNAS Registration Number: | CNAS L18252 |
| FCC Designation Number | CN1340 |
| CAB identifier: | CN0145 |
| A2LA Certificate Number: | 6823.01 |

## 1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

| Uncertainty | |
|---|---|
| Parameter | Uncertainty |
| Occupied Channel Bandwidth | ±102kHz |
| RF power conducted | ±0.243dB |
| Power Spectral Density | ±0.743dB |
| Conducted Spurious Emission | ±1.328dB |
| Time | ±0.19% |
| Conducted emission(9kHz~30MHz) AC main | ±2.68dB |
| Radiated emission(9kHz~30MHz) | ±3.50dB |
| Radiated emission (30MHz~1GHz) | ±4.20dB |
| Radiated emission (1GHz~18GHz) | ±5.10dB |
| Radiated emission (18GHz~40GHz) | ±5.26dB |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

## 1.3 TEST ENVIRONMENT CONDITIONS

| Test Item | Temperature | Humidity | Test Voltage | Tested By |
|---|---|---|---|---|
| AC Power Line Conducted Emissions | 24.6°C | 58% | AC 120V/60Hz | Keith Huang |
| Radiated Emissions-9 kHz to 30 MHz | 24.8°C | 54% | AC 120V/60Hz | Lemon He |
| Radiated Emissions-30 MHz to 1000 MHz | 24.8°C | 54% | AC 120V/60Hz | Lemon He |
| Radiated Emissions-Above 1000 MHz | 24.8°C | 54% | AC 120V/60Hz | Lemon He |
| Bandwidth | 23.9°C | 53% | DC 12V | Elio Lin |
| Maximum Output Power | 23.9°C | 53% | DC 12V | Elio Lin |
| Conducted Spurious Emission | 23.9°C | 53% | DC 12V | Elio Lin |
| Number of Hopping Frequency | 23.9°C | 53% | DC 12V | Elio Lin |
| Average Time of Occupancy | 23.9°C | 53% | DC 12V | Elio Lin |
| Hopping Channel Separation | 23.9°C | 53% | DC 12V | Elio Lin |

Note: Adapter supply voltage AC 120V/60Hz.

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Sample No. | POC260901001-S001 |
| Product name | HHOLOVE Automatic Cat Litter Box Ease |
| Model name | CT-LBWES, CT-LBWES-WB |
| Test model | CT-LBWES |
| Model difference | Only the model name is different |
| Trade Mark | HHOLOVE, ABRCT |
| Power supply | DC 12V from adapter |
| Adapter information | Model name: JF018WR-1200150UH<br>Input: 100-240V~, 50/60Hz, 0.5A<br>Output: 12.0V⎓1.5A 18.0W |
| Operate temperature | 0℃-45℃ |
| Operation Frequency | 2402 MHz ~ 2480 MHz |
| Modulation Type | GFSK, π/4-DQPSK, 8-DPSK |
| Bit Rate of Transmitter | 1Mbps, 2Mbps, 3Mbps |
| Max. Output Power | 1Mbps: 1.60dBm (1.45mW) |
| Antenna gain | 2.54dBi |
| Antenna type | PCB Antenna |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. Channel List:

| Channel | Frequency(MHz) | Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|---|---|
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

## 2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

| Pretest Mode | Description |
|---|---|
| Mode 1 | TX Mode_1Mbps Channel 00/39/78 |
| Mode 2 | TX Mode_2Mbps Channel 00/39/78 |
| Mode 3 | TX Mode_3Mbps Channel 00/39/78 |
| Mode 4 | TX Mode_1Mbps Channel 00/39/78(Hopping) |
| Mode 5 | TX Mode_2Mbps Channel 00/39/78(Hopping) |
| Mode 6 | TX Mode_3Mbps Channel 00/39/78(Hopping) |
| Mode 7 | TX Mode_1Mbps Channel 39 |

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

| **AC power line conducted emissions test** | |
|---|---|
| Final Test Mode | Description |
| Mode 7 | TX Mode_1Mbps Channel 39 |

| **Radiated emissions test - Below 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 7 | TX Mode_1Mbps Channel 39 |

| **Radiated emissions test - Above 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode_1Mbps Channel 00/39/78 |

| **Maximum Output Power / Bandwidth / Conducted Spurious Emission** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode_1Mbps Channel 00/39/78 |
| Mode 2 | TX Mode_2Mbps Channel 00/39/78 |
| Mode 3 | TX Mode_3Mbps Channel 00/39/78 |

| **Other Conducted test** | |
|---|---|
| Final Test Mode | Description |
| Mode 4 | TX Mode_1Mbps Channel 00/39/78(Hopping) |
| Mode 5 | TX Mode_2Mbps Channel 00/39/78(Hopping) |
| Mode 6 | TX Mode_3Mbps Channel 00/39/78(Hopping) |

Note:

(1) The measurements for Output Power were tested with DH1/3/5 during 1Mbps, 2Mbps and 3Mbps, the worst case were 1Mbps (DH5), 2Mbps (DH5) and 3Mbps (DH5), only worst case were documented for other test items except Average Time of Occupancy.

(2) For radiated emission above 1 GHz test, the spurious points of 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all

below the limit value of 20dB.

(3) This product has the mode of BT AFH, which was considered during testing. 800/20/X(X = 2 of DH1, X = 4 of DH3 or X = 6 of DH5) with 20, 10 or 6.67 hops per second in a channel, and then multiply 0.4*20 (20 # of hopping). But this mode is not the worst case mode as duration of the packet is same, and this report only shows the worst case mode.

(4) For AC power line conducted emissions and radiated spurious emissions below 1 GHz test, the 1Mbps Channel 39 are found to be the worst case and recorded.

## 2.3 PARAMETERS OF TEST SOFTWARE

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

| Test Software Version | RTLBTAPP | | |
|---|---|---|---|
| Frequency (MHz) | 2402 | 2441 | 2480 |
| 1Mbps | Default | Default | Default |
| 2Mbps | Default | Default | Default |
| 3Mbps | Default | Default | Default |

## 2.4 SUPPORT UNITS

| No. | Equipment | Model | Manufacturer | Series No |
|---|---|---|---|---|
| / | / | / | / | / |

## 3. AC POWER LINE CONDUCTED EMISSIONS

### 3.1 LIMIT

| Frequency of Emission (MHz) | Limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 to 56* | 56 to 46* |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

Note:

(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 3.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

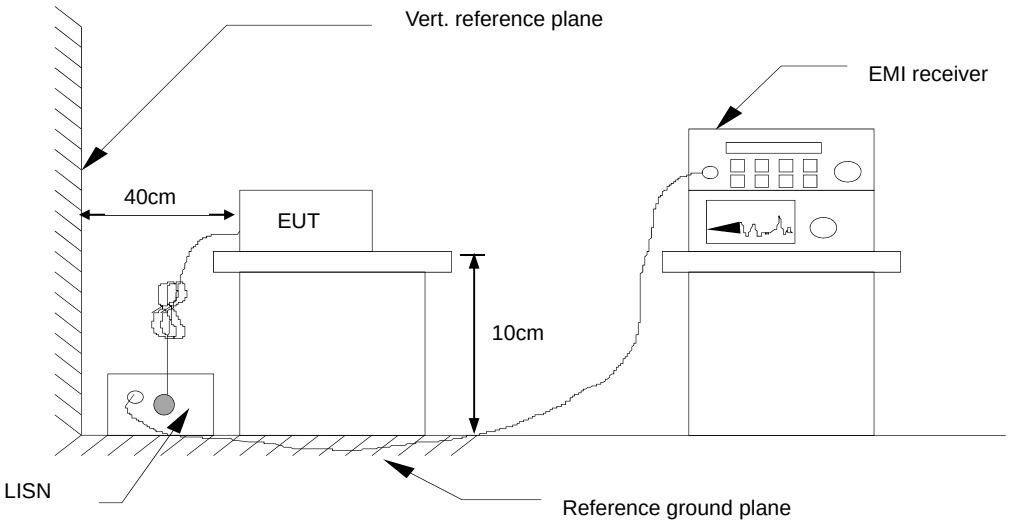
The following table is the setting of the receiver:

| Receiver Parameters | Setting |
|---|---|
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

### 3.3 DEVIATION FROM TEST STANDARD

No deviation.

## 3.4 TEST SETUP




## 3.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting data or hopping on mode.

## 3.6 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "*" marked in AVG Mode column of Interference Voltage Measured.

(2) Measuring frequency range from 150 kHz to 30 MHz.

## 4. RADIATED EMISSIONS

### 4.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

| Frequency (MHz) | (dBuV/m at 3 m) | |
|---|---|---|
| | Peak | Average |
| Above 1000 | 74 | 54 |

Note:

(1) The limit for radiated test was performed according to FCC CFR Title 47, Part 15, Subpart C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

## 4.2 TEST PROCEDURE

a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

The following table is the setting of the receiver:

| Spectrum Parameters | Setting |
|---|---|
| Start ~ Stop Frequency | 9 kHz~150 kHz for RBW 200 Hz |
| Start ~ Stop Frequency | 0.15 MHz~30 MHz for RBW 9 kHz |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for RBW 100 kHz |

| Spectrum Parameters | Setting |
|---|---|
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RBW / VBW<br>(Emission in restricted band) | 1 MHz / 3 MHz for PK value<br>1 MHz / 1/T Hz for AVG value |

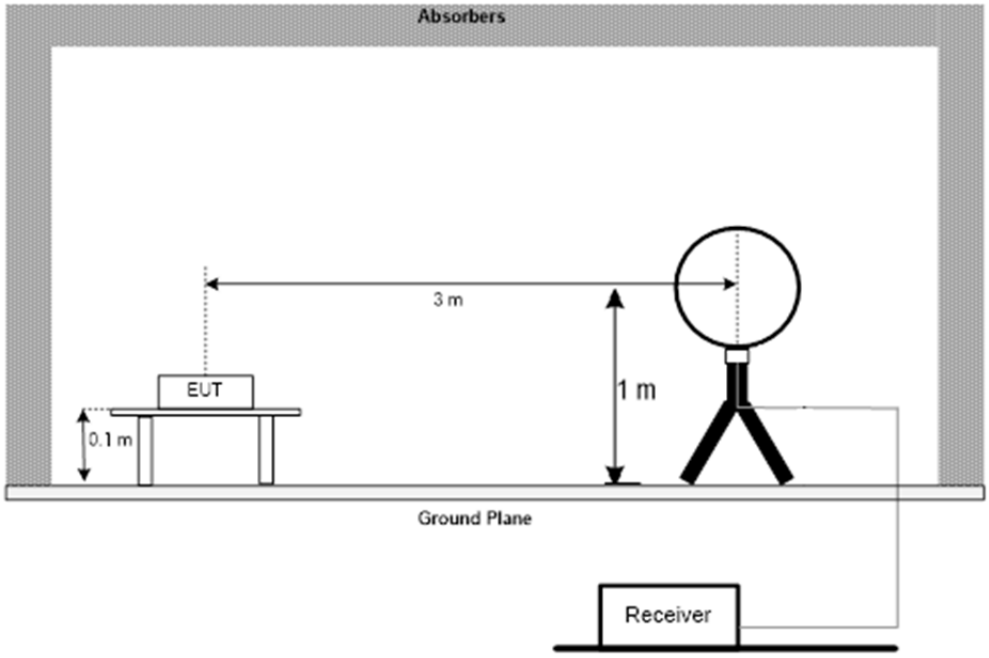
| Spectrum Parameters | Setting |
|---|---|
| Start ~ Stop Frequency | 9 kHz~90 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 90 kHz~110 kHz for QP detector |
| Start ~ Stop Frequency | 110 kHz~490 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 490 kHz~30 MHz for QP detector |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for QP detector |
| Start ~ Stop Frequency | 1 GHz~26.5 GHz for PK/AVG detector |

## 4.3 DEVIATION FROM TEST STANDARD

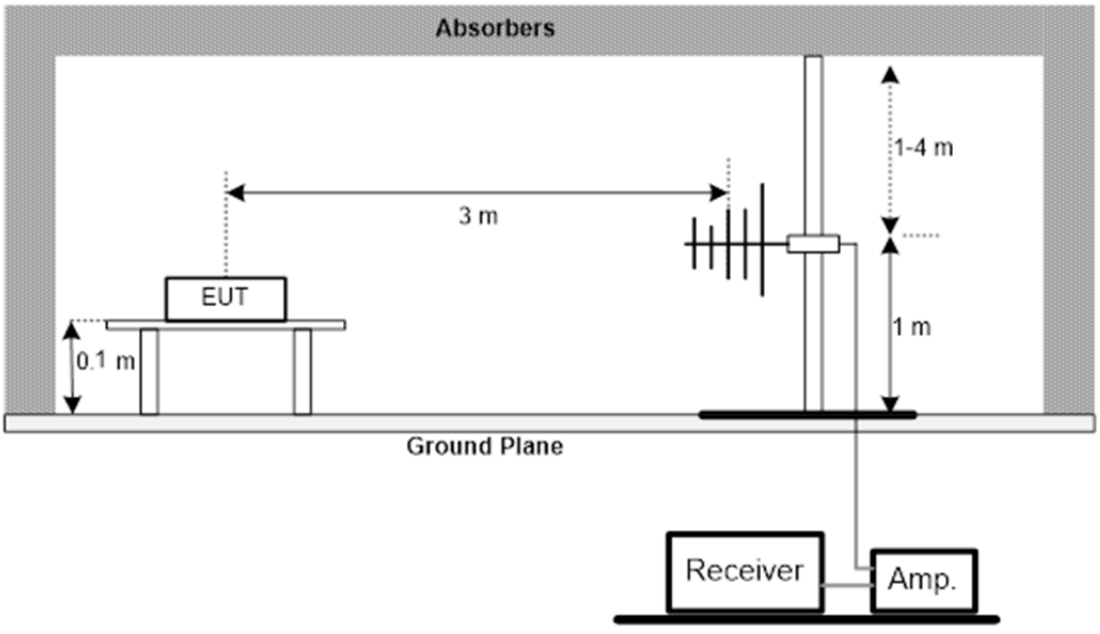
No deviation.

## 4.4 TEST SETUP

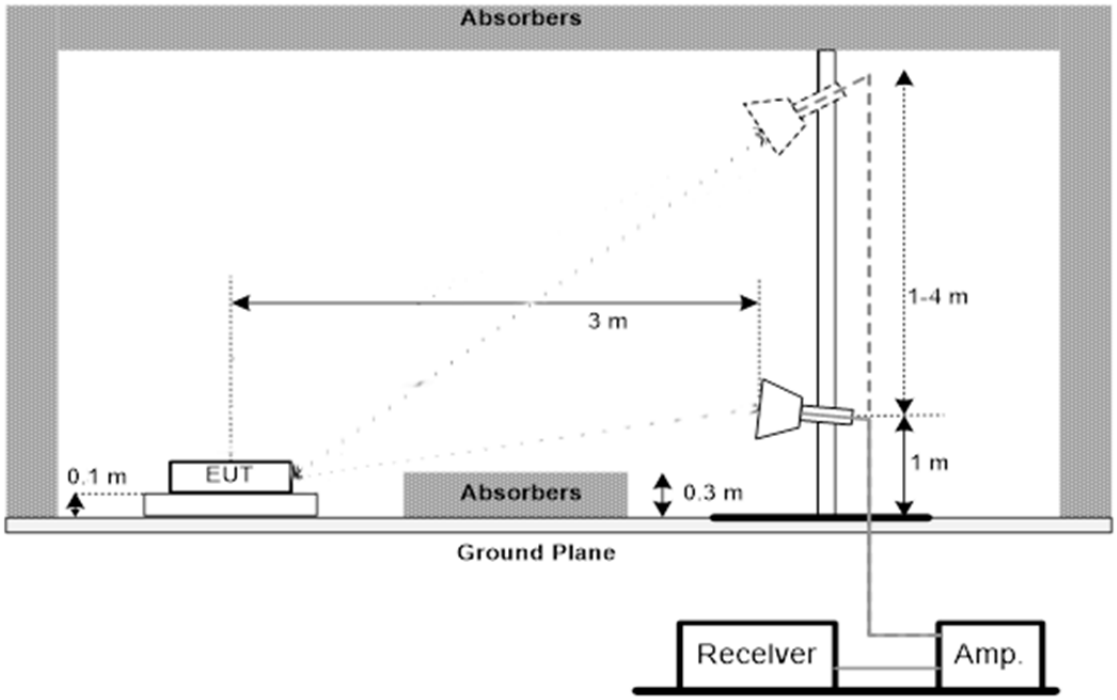
**9 kHz to 30 MHz**




**30 MHz to 1 GHz**



**Above 1 GHz**




## 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 4.6 TEST RESULTS - 9 kHz TO 30 MHz

Please refer to the APPENDIX B.

Remark:

(1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
(2) Limit line = specific limits (dBuV) + distance extrapolation factor.

## 4.7 TEST RESULTS - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

## 4.8 TEST RESULTS - ABOVE 1000 MHz

Please refer to the APPENDIX D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

## 5. NUMBER OF HOPPING FREQUENCY

### 5.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(a)(1)(iii) | Number of Hopping Frequency | 15 |

### 5.2 TEST PROCEDURE

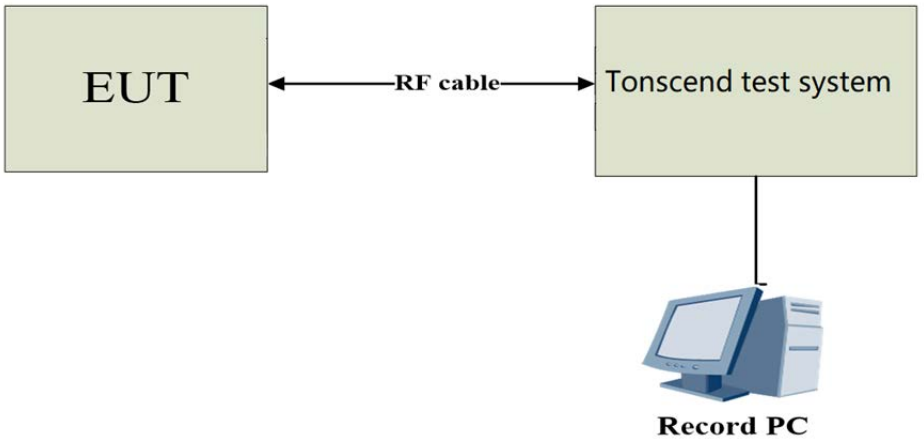
a. The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | > Operating Frequency Range |
| RBW | 300 kHz |
| VBW | 300 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 5.3 DEVIATION FROM STANDARD

No deviation.

### 5.4 TEST SETUP




### 5.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 5.6 TEST RESULTS

Please refer to the APPENDIX E.

## 6. AVERAGE TIME OF OCCUPANCY

### 6.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(a)(1)(iii) | Average Time of Occupancy | 0.4sec |

### 6.2 TEST PROCEDURE

Use the following spectrum analyzer settings to determine the dwell time per hop:

a. Span: Zero span, centered on a hopping channel.
b. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected transmission time per hop.
c. Sweep time: Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = 1/hopping rate) should achieve this.
d. Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.
e. Detector function: Peak.
f. Trace: Clear-write, single sweep.
g. Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.

To determine the number of hops on a channel in the regulatory observation period repeat the measurement using a longer sweep time. When the device uses a single hopping sequence the period of measurement should be sufficient to capture at least 2 hops. When the device uses a dynamic hopping sequence, or the sequence varies, the period of measurement may need to capture multiple hops to better determine the average time of occupancy. Count the number of hops on the channel across the sweep time.

The average number of hops on the same channel within the regulatory observation period is calculated from the number of hops on the channel divided by the spectrum analyzer sweep time multiplied by the regulatory observation period. For example, if three hops are counted with an analyzer sweep time of 500 ms and the regulatory observation period is 10 s, then the number of hops in that ten seconds is 3 / 0.5 × 10, or 60 hops.

The average time of occupancy is calculated by multiplying the dwell time per hop by the number of hops in the observation period.

Where the device shares the same hopping algorithms (dwell time, channel selection) across multiple data rates or modulation schemes then the time of occupancy need only be measured for one of those modulation schemes or data rates. If the dwell time value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in dwell time.

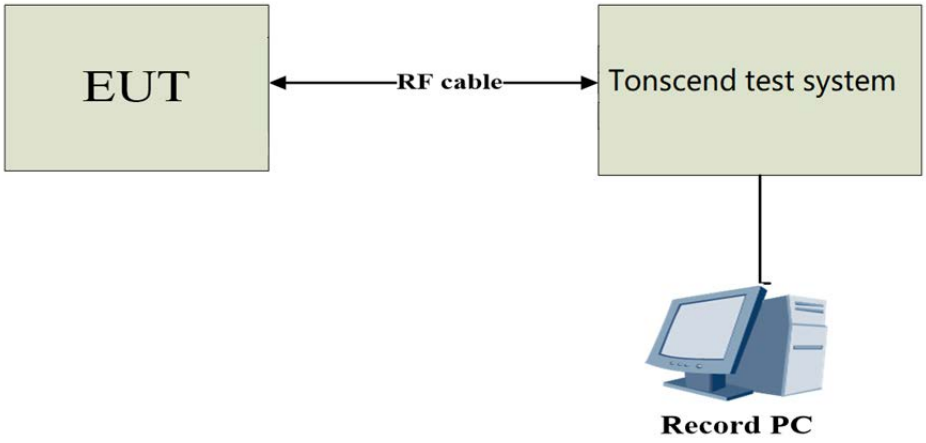
The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | 0 MHz |
| RBW | 1 MHz |
| VBW | 1 MHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | As necessary to capture the entire dwell time per hopping channel |

### 6.3 DEVIATION FROM STANDARD

No deviation.

## 6.4 TEST SETUP




## 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 6.6 TEST RESULTS

Please refer to the APPENDIX F.

## 7. HOPPING CHANNEL SEPARATION

### 7.1 LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

### 7.2 TEST PROCEDURE

a. The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.

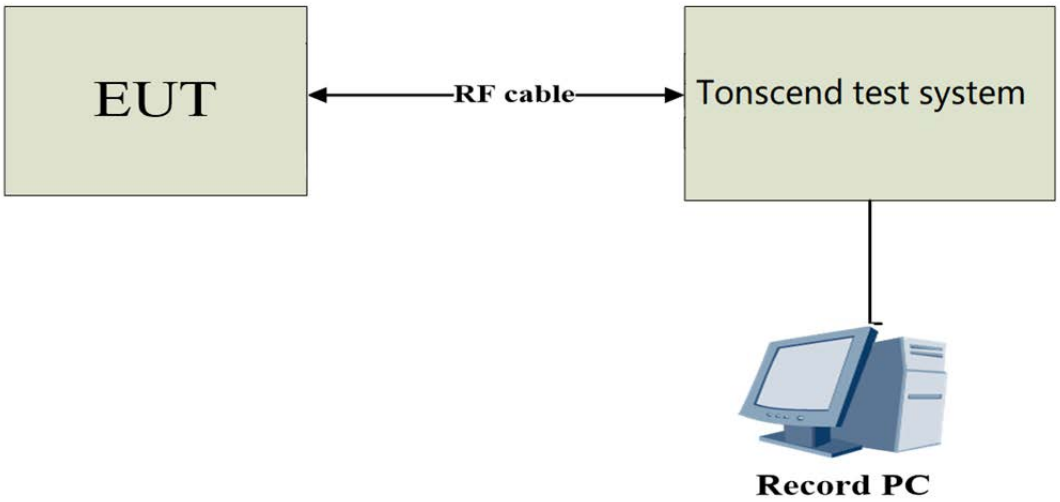
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | Wide enough to capture the peaks of two adjacent channels |
| RBW | 300 kHz |
| VBW | 300 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 7.3 DEVIATION FROM STANDARD

No deviation.

### 7.4 TEST SETUP




### 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 7.6 TEST RESULTS

Please refer to the APPENDIX G.

## 8. BANDWIDTH

### 8.1 LIMIT

| Section | Test Item |
|---|---|
| FCC 15.247(a)(1) | Bandwidth |

### 8.2 TEST PROCEDURE

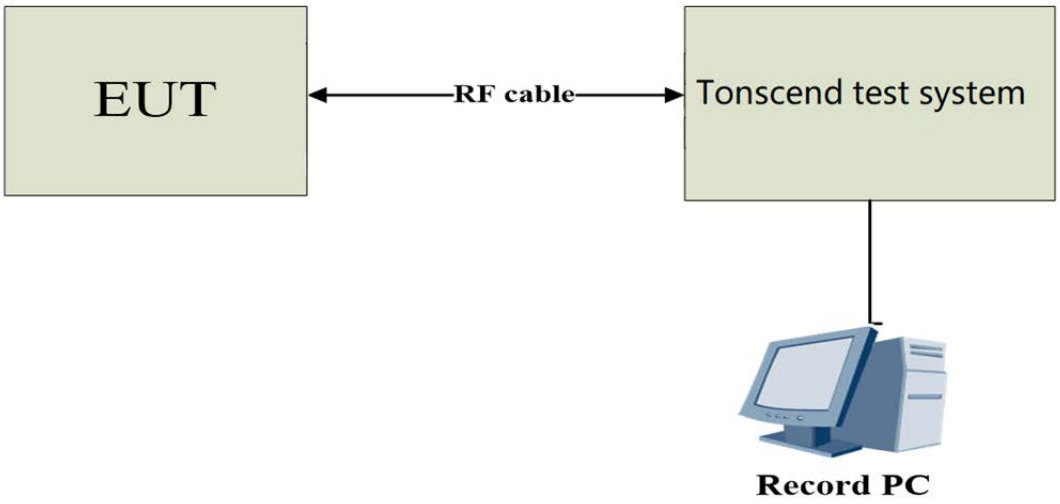
a. The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | > Measurement Bandwidth |
| RBW | 30 kHz |
| VBW | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP




### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULTS

Please refer to the APPENDIX H.

## 9. MAXIMUM OUTPUT POWER

### 9.1 LIMIT

| Section | Test Item | Limit |
|---|---|---|
| FCC 15.247(a)(1) | Maximum Output Power | 0.1250 Watt or 20.97 dBm |

Note: Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

### 9.2 TEST PROCEDURE

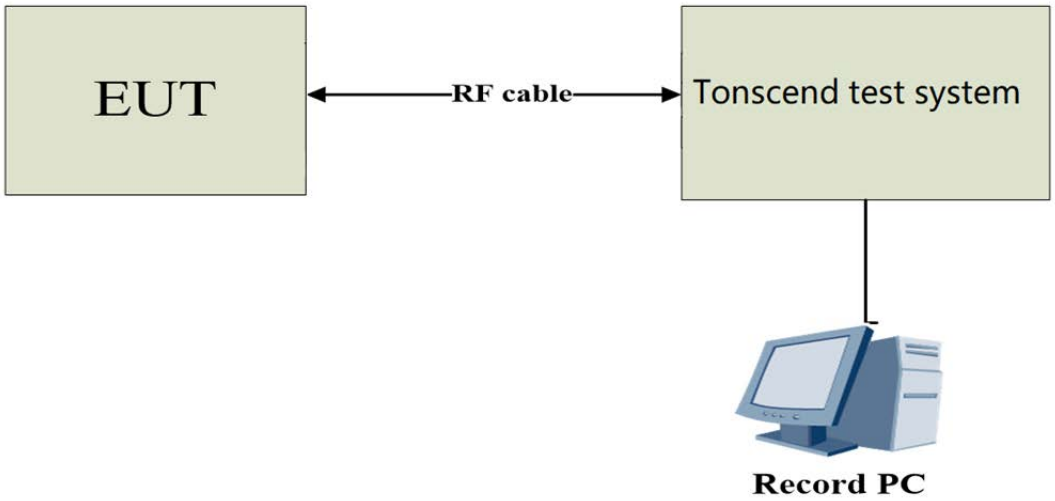
a. The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Span Frequency | Approximately five times the 20 dB bandwidth, centered on a hopping channel. |
| RBW | 3 MHz |
| VBW | 8 MHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 9.3 DEVIATION FROM STANDARD

No deviation.

### 9.4 TEST SETUP




### 9.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 9.6 TEST RESULTS

Please refer to the APPENDIX I.

## 10. CONDUCTED SPURIOUS EMISSION

### 10.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

### 10.2 TEST PROCEDURE

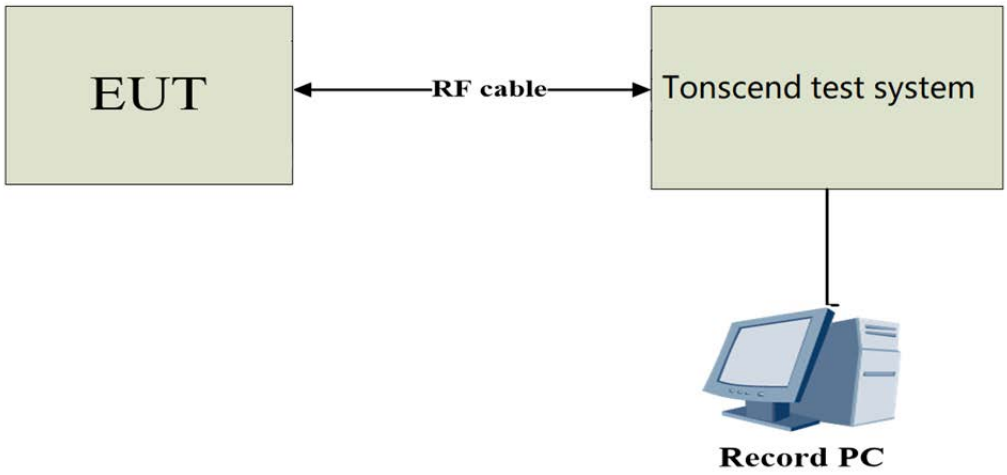
a. The EUT was directly connected to the tonscend test system and antenna output port as show in the block diagram below.
b. The following table is the setting of the spectrum analyzer:

| Spectrum Parameters | Setting |
|---|---|
| Start Frequency | 30 MHz |
| Stop Frequency | 26.5 GHz |
| RBW | 100 kHz |
| VBW | 300 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 10.3 DEVIATION FROM STANDARD

No deviation.

### 10.4 TEST SETUP




### 10.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 10.6 TEST RESULTS

Please refer to the APPENDIX J.

## 11. MEASUREMENT INSTRUMENTS LIST

| No. | Name of Equipment | Manufacturer | Model Number | Serial Number | Inventory No. | Last Calibration | Due Calibration |
|---|---|---|---|---|---|---|---|
| Radiated Emission | | | | | | | |
| 1 | Test receiver | Rohde&Schwarz | ESU | 100184 | JLE011 | 2026/2/27 | 2027/2/26 |
| 2 | Log periodic antenna | Schwarzbeck | VULB 9168 | 1151 | JLE012 | 2025/4/12 | 2028/4/11 |
| 3 | Low frequency amplifier | / | LNA 0920N | 2014 | JLE023 | 2026/2/27 | 2027/2/26 |
| 4 | High frequency amplifier | Schwarzbeck | BBV 9718 | 9718-284 | JLE024 | 2026/2/27 | 2027/2/26 |
| 5 | Horn Antenna | SCHWARZBECK | BBHA 9120 D | 02670 | JLE028 | 2025/4/12 | 2028/4/11 |
| 6 | Temp&Humidity Recorder | Meideshi | JR900 | / | JLE021 | 2026/4/8 | 2027/4/7 |
| 7 | Horn Antenna | SCHWARZBECK | BBHA 9170 | 9170#685 | JLE029 | 2024/7/15 | 2027/7/14 |
| 8 | Loop Antenna | SCHWARZBECK | FMZB1519B | 00029 | JLE030 | 2024/7/15 | 2027/7/14 |
| 9 | Broadband preamplifier | Schwarzbeck | BBV9721 | 9721-019 | JLE025 | 2026/2/27 | 2027/2/26 |
| 10 | Filter | dsusoft | ZBSF6-C5170-5330-544 | 07227557 | / | N/A | N/A |
| 11 | Filter | dsusoft | ZBSF6-C5495-5705-1309 | 07227558 | / | N/A | N/A |
| 12 | Filter | dsusoft | ZBSF6-C5745-5830-1310 | 07227559 | / | N/A | N/A |
| 13 | Filter | dsusoft | ZBSF6-C2400-2483.5-543 | 07227559 | / | N/A | N/A |
| 14 | 10dB attenuator | dsusoft | 10dB | / | / | N/A | N/A |
| 15 | Filter | dsusoft | ZBSF6-C3000-18000-174 | 07227597 | / | N/A | N/A |
| 16 | Filter | dsusoft | ZBSF6-C6500-18000-547 | 07227595 | / | N/A | N/A |
| 17 | Test software | Farad Technology Co., Ltd | EZ-EMC Ver.TW-03A2 | | | | |
| Conducted Emission | | | | | | | |
| 1 | LISN | Rohde&Schwarz | ENV216 | 100075 | JLE002 | 2026/2/27 | 2027/2/26 |
| 2 | ISN | Schwarzbeck | CATE 5 8158 | #171 | JLE003 | 2026/2/27 | 2027/2/26 |
| 3 | ISN | Schwarzbeck | CAT 3 8158 | 00187 | JLE032 | 2026/2/27 | 2027/2/26 |
| 4 | Test receiver | Rohde&Schwarz | ESCI | 100718 | JLE010 | 2026/2/27 | 2027/2/26 |
| 5 | Pulse limiter | Rohde&Schwarz | ESH3-Z2 | 102299 | JLE047 | 2026/2/27 | 2027/2/26 |
| 6 | Temp&Humidity Recorder | Meideshi | JR900 | / | JLE020 | 2026/4/8 | 2027/4/7 |
| 7 | Test software | Farad Technology Co., Ltd | EZ-EMC Ver.TW-03A2 | | | | |
| RF Conducted Emissions | | | | | | | |
| 1 | MXA Signal Analyzer | Keysight | N9010A | MY51440158 | JLE087 | 2026/9/10 | 2027/9/9 |
| 2 | MXA Signal Analyzer | Agilent | N9020A | MY52220022 | JLE090 | 2026/1/19 | 2027/1/18 |
| 3 | RF Control Unit | dsusoft | JS0806-2 | 21G8060449 | JLE053 | 2026/2/27 | 2027/2/26 |
| 4 | power supply unit | dsusoft | JS0806-4ADC | N/A | JLE055 | 2026/2/27 | 2027/2/26 |
| 5 | VXG Signal Generator | Keysight | N5182B | MY59100855 | JLE068 | 2026/4/11 | 2027/4/10 |
| 6 | EXG Analog Signal Generator | Keysight | N5173B | MY59101282 | JLE052 | 2026/2/27 | 2027/2/26 |
| 7 | Wideband Radio Communication Tester | Rohde&Schwarz | CMW500 | 1201.0002K50-116064-Dt | JLE054 | 2026/2/27 | 2027/2/26 |
| 8 | Test software | dsusoft | JS1120-3 Ver.3.2.22.0 | | | | |

## 12. ANTENNA REQUIREMENT

Test standard: FCC part 15.203

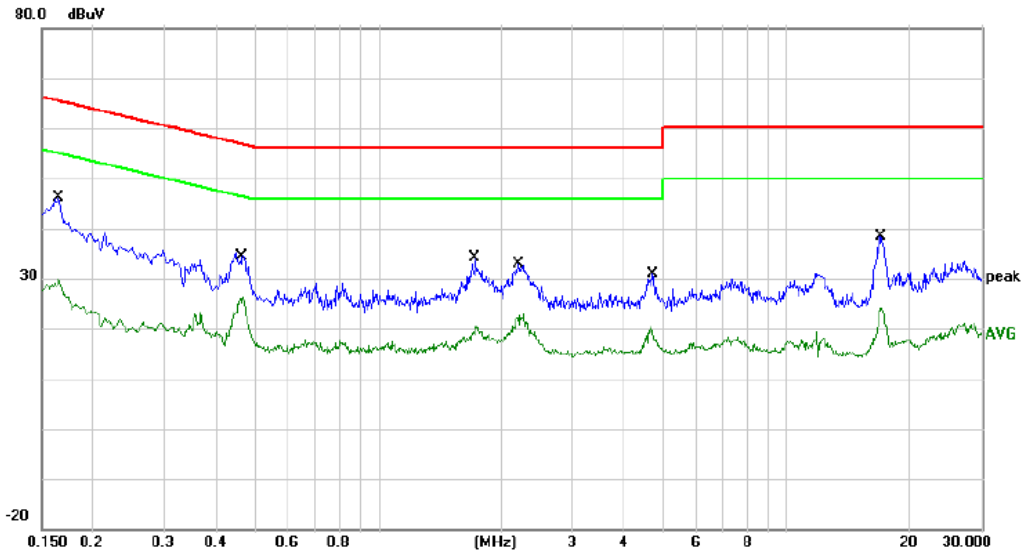
According to the manufacturer declared, the EUT has one PCB antenna, the antenna gain is 2.54dBi and the antenna connector is designed with permanent attachment.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

# APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

| Test Mode | TX Mode_1Mbps Channel 39 | Phase | Line |
|---|---|---|---|

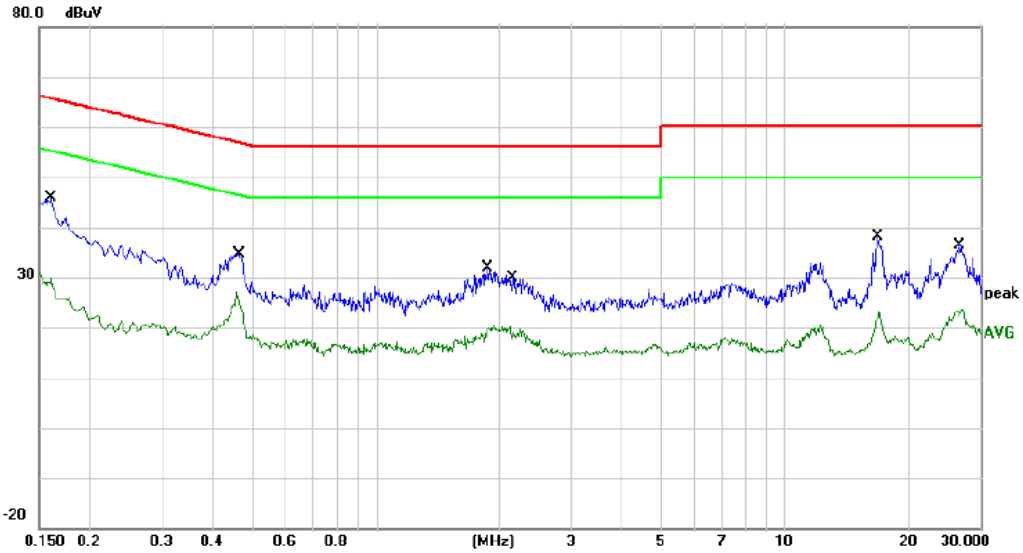



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | cm | degree | Comment |
| 1 | * | 0.1650 | 26.48 | 19.56 | 46.04 | 65.21 | -19.17 | QP | | | |
| 2 | | 0.1650 | 10.33 | 19.56 | 29.89 | 55.21 | -25.32 | AVG | | | |
| 3 | | 0.4586 | 15.81 | 19.30 | 35.11 | 56.72 | -21.61 | QP | | | |
| 4 | | 0.4586 | 6.81 | 19.30 | 26.11 | 46.72 | -20.61 | AVG | | | |
| 5 | | 1.7340 | 14.99 | 19.26 | 34.25 | 56.00 | -21.75 | QP | | | |
| 6 | | 1.7340 | 1.42 | 19.26 | 20.68 | 46.00 | -25.32 | AVG | | | |
| 7 | | 2.2060 | 13.72 | 19.27 | 32.99 | 56.00 | -23.01 | QP | | | |
| 8 | | 2.2060 | 3.52 | 19.27 | 22.79 | 46.00 | -23.21 | AVG | | | |
| 9 | | 4.7060 | 11.43 | 19.38 | 30.81 | 56.00 | -25.19 | QP | | | |
| 10 | | 4.7060 | 0.87 | 19.38 | 20.25 | 46.00 | -25.75 | AVG | | | |
| 11 | | 17.0260 | 19.01 | 19.40 | 38.41 | 60.00 | -21.59 | QP | | | |
| 12 | | 17.0260 | 4.78 | 19.40 | 24.18 | 50.00 | -25.82 | AVG | | | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | TX Mode_1Mbps Channel 39 | Phase | Neutral |
|---|---|---|---|

**Conducted Emission**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | cm | degree | Comment |
| 1 | * | 0.1601 | 30.41 | 19.56 | 49.97 | 65.46 | -15.49 | QP | | | |
| 2 | | 0.1601 | 13.98 | 19.56 | 33.54 | 55.46 | -21.92 | AVG | | | |
| 3 | | 0.4641 | 7.93 | 19.30 | 27.23 | 56.62 | -29.39 | QP | | | |
| 4 | | 0.4641 | 4.63 | 19.30 | 23.93 | 46.62 | -22.69 | AVG | | | |
| 5 | | 1.8860 | 12.57 | 19.26 | 31.83 | 56.00 | -24.17 | QP | | | |
| 6 | | 1.8860 | 1.17 | 19.26 | 20.43 | 46.00 | -25.57 | AVG | | | |
| 7 | | 2.1410 | 4.69 | 19.27 | 23.96 | 56.00 | -32.04 | QP | | | |
| 8 | | 2.1410 | -1.04 | 19.27 | 18.23 | 46.00 | -27.77 | AVG | | | |
| 9 | | 16.9157 | 9.17 | 19.40 | 28.57 | 60.00 | -31.43 | QP | | | |
| 10 | | 16.9157 | 0.27 | 19.40 | 19.67 | 50.00 | -30.33 | AVG | | | |
| 11 | | 26.7460 | 16.92 | 19.58 | 36.50 | 60.00 | -23.50 | QP | | | |
| 12 | | 26.7460 | 4.05 | 19.58 | 23.63 | 50.00 | -26.37 | AVG | | | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ

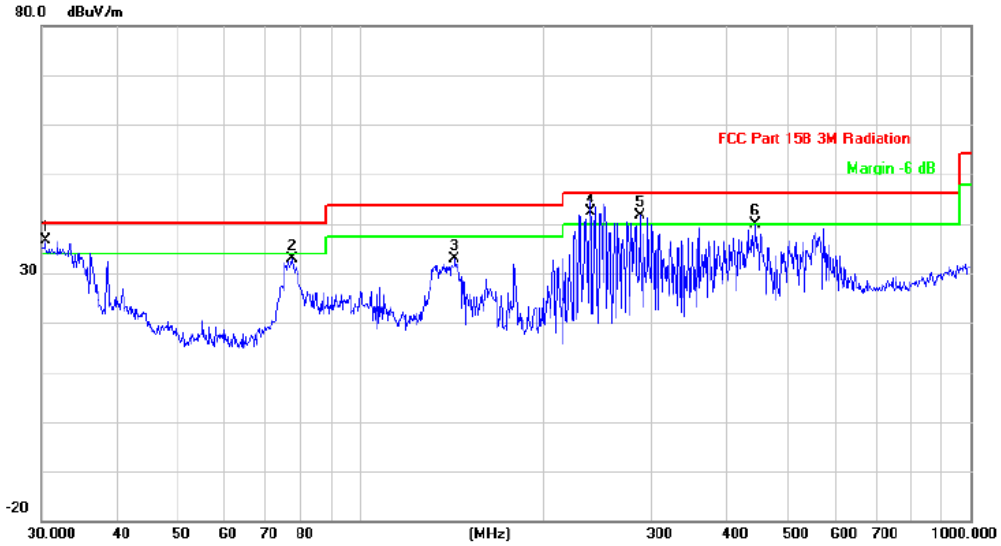
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

# APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Vertical |
|---|---|---|---|

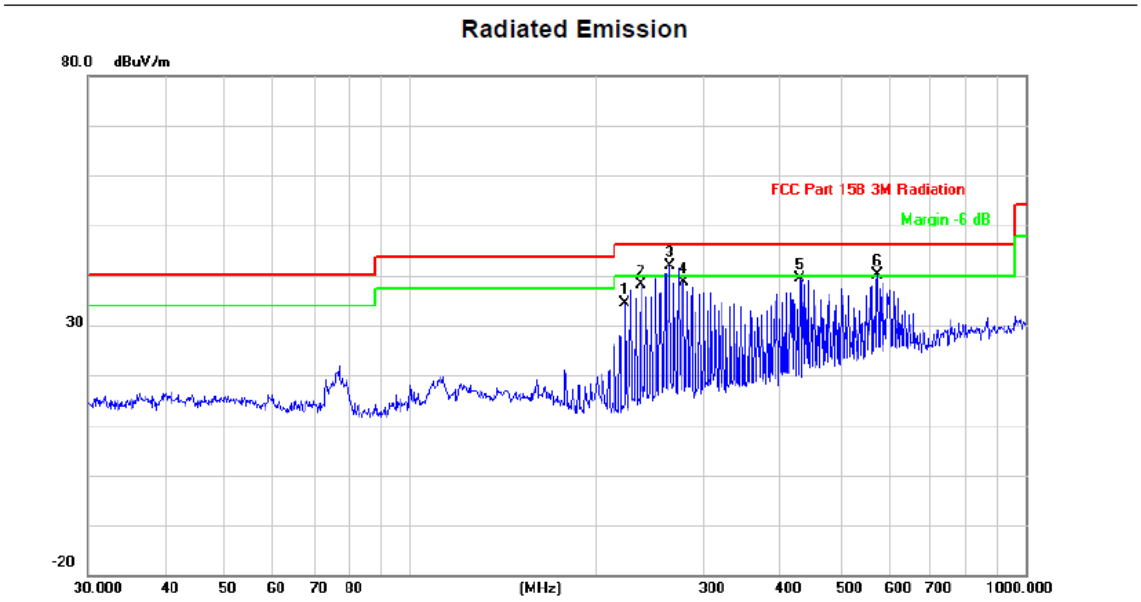
**Radiated Emission**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | * | 30.4237 | 47.55 | -10.83 | 36.72 | 40.00 | -3.28 | peak | | | |
| 2 | | 77.3210 | 46.63 | -13.72 | 32.91 | 40.00 | -7.09 | peak | | | |
| 3 | | 142.8240 | 43.18 | -10.42 | 32.76 | 43.50 | -10.74 | peak | | | |
| 4 | ! | 238.3101 | 54.23 | -11.84 | 42.39 | 46.00 | -3.61 | QP | | | |
| 5 | ! | 286.9823 | 52.26 | -10.71 | 41.55 | 46.00 | -4.45 | peak | | | |
| 6 | | 444.8514 | 46.41 | -6.52 | 39.89 | 46.00 | -6.11 | peak | | | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode | TX Mode_1Mbps Channel 39 | Polarization | Horizontal |
|---|---|---|---|




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 223.7333 | 47.38 | -13.01 | 34.37 | 46.00 | -11.63 | peak |
| 2 | | 237.4760 | 50.08 | -11.98 | 38.10 | 46.00 | -7.90 | peak |
| 3 | * | 263.8190 | 53.15 | -11.38 | 41.77 | 46.00 | -4.23 | peak |
| 4 | | 278.0668 | 49.22 | -10.67 | 38.55 | 46.00 | -7.45 | peak |
| 5 | | 429.5228 | 46.50 | -7.11 | 39.39 | 46.00 | -6.61 | peak |
| 6 | ! | 574.6258 | 43.56 | -3.45 | 40.11 | 46.00 | -5.89 | peak |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

| Frequency (MHz) | Read Level (dBμV) | Polarization | Factor (dB/m) | Measurement (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| DH5 TX CH00 | | | | | | | |
| 4804.00 | 49.81 | H | -3.94 | 45.87 | 74.00 | 28.13 | peak |
| 2310.00 | 46.14 | H | -1.98 | 44.16 | 74.00 | 29.84 | peak |
| 2390.00 | 47.36 | H | -1.58 | 45.78 | 74.00 | 28.22 | peak |
| 4804.00 | 50.68 | V | -3.94 | 46.74 | 74.00 | 27.26 | peak |
| 2310.00 | 46.29 | V | -1.98 | 44.31 | 74.00 | 29.69 | peak |
| 2390.00 | 48.05 | V | -1.58 | 46.47 | 74.00 | 27.53 | peak |
| DH5 TX CH39 | | | | | | | |
| 4882.00 | 50.04 | H | -3.97 | 46.07 | 74.00 | 27.93 | peak |
| 4882.00 | 50.90 | V | -3.97 | 46.93 | 74.00 | 27.07 | peak |
| DH5 TX CH78 | | | | | | | |
| 4960.00 | 49.85 | H | -3.91 | 45.94 | 74.00 | 28.06 | peak |
| 2483.50 | 46.64 | H | -0.62 | 46.02 | 74.00 | 27.98 | peak |
| 2500.00 | 45.45 | H | -0.45 | 45.00 | 74.00 | 29.00 | peak |
| 4960.00 | 50.60 | V | -3.91 | 46.69 | 74.00 | 27.31 | peak |
| 2483.50 | 47.47 | V | -0.62 | 46.85 | 74.00 | 27.15 | peak |
| 2500.00 | 45.73 | V | -0.45 | 45.28 | 74.00 | 28.72 | peak |

**Note:** 1. The other emission levels were very low against the limit.
2. Measurement = Reading Level+ Correct Factor, Margin = Limit- Measurement

# APPENDIX E - NUMBER OF HOPPING FREQUENCY

| Test Mode | Antenna | Freq(MHz) | Result[Num] | Limit[Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

**Test Graphs**


DH5-Ant1-Hop-PASS

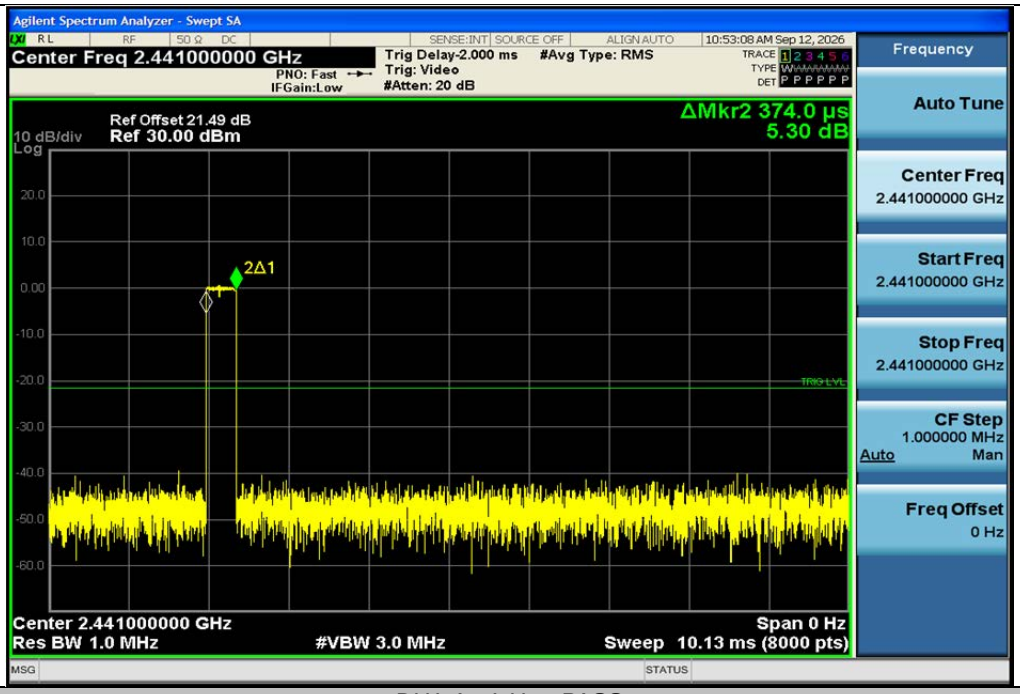

2DH5-Ant1-Hop-PASS


3DH5-Ant1-Hop-PASS

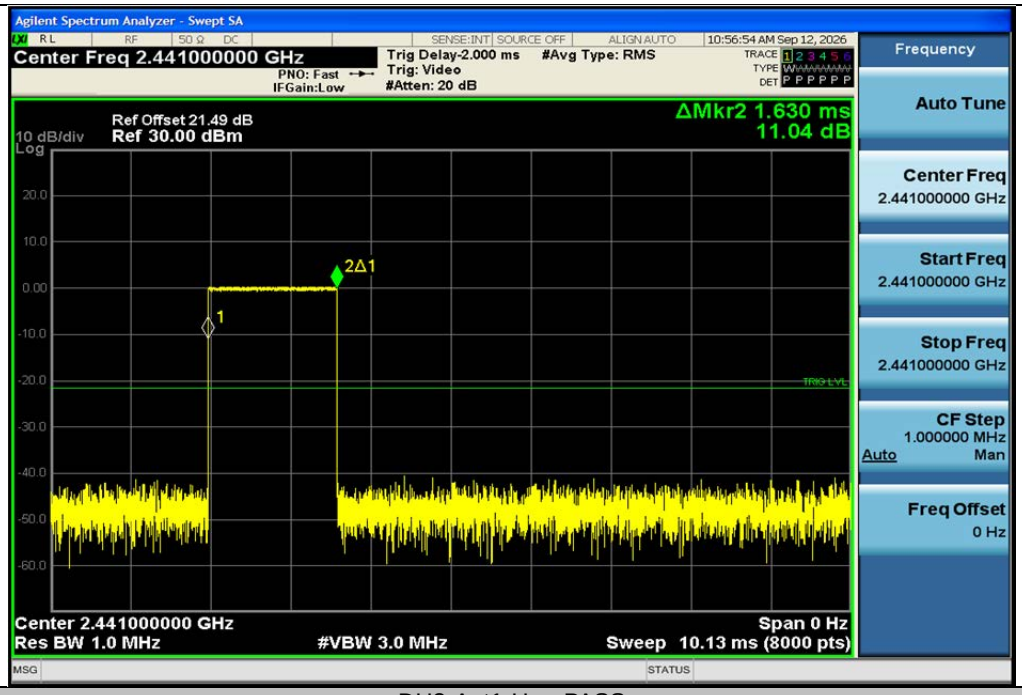
# APPENDIX F - AVERAGE TIME OF OCCUPANCY

| Test Mode | Antenna | Frequency[MHz] | Burst Width [ms] | Total Hops [Num] | Result[s] | Limit[s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 0.374 | 314 | 0.117 | ≤0.4 | PASS |
| DH3 | Ant1 | Hop | 1.630 | 162 | 0.264 | ≤0.4 | PASS |
| DH5 | Ant1 | Hop | 2.878 | 110 | 0.317 | ≤0.4 | PASS |
| 2DH1 | Ant1 | Hop | 0.381 | 327 | 0.125 | ≤0.4 | PASS |
| 2DH3 | Ant1 | Hop | 1.634 | 162 | 0.265 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.882 | 100 | 0.288 | ≤0.4 | PASS |
| 3DH1 | Ant1 | Hop | 0.381 | 323 | 0.123 | ≤0.4 | PASS |
| 3DH3 | Ant1 | Hop | 1.633 | 164 | 0.268 | ≤0.4 | PASS |
| 3DH5 | Ant1 | Hop | 2.883 | 107 | 0.308 | ≤0.4 | PASS |

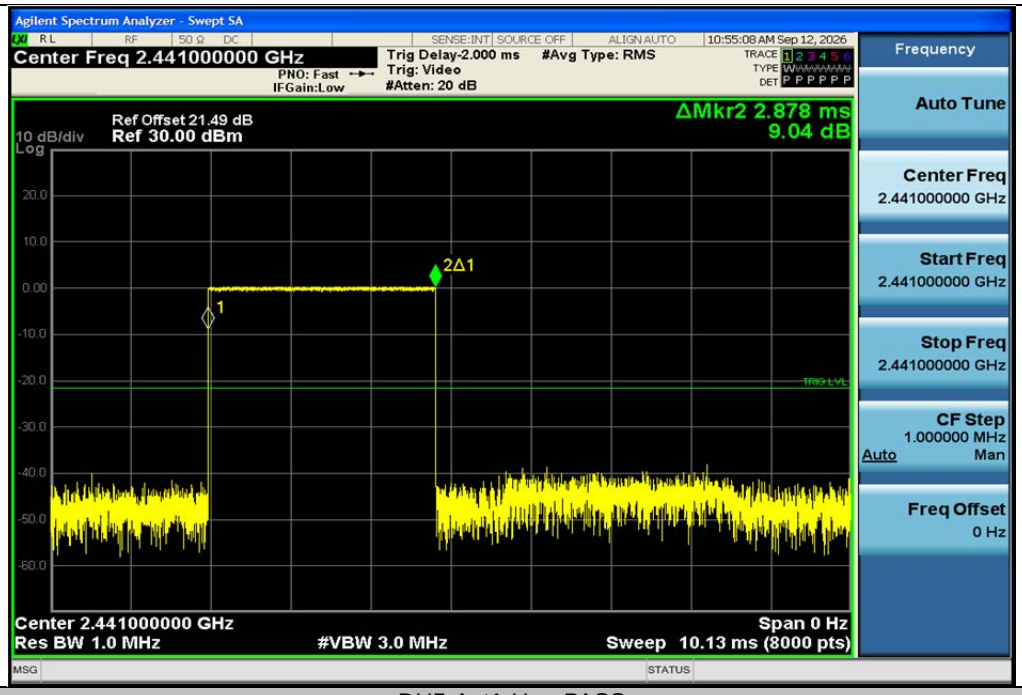
**Test Graphs**



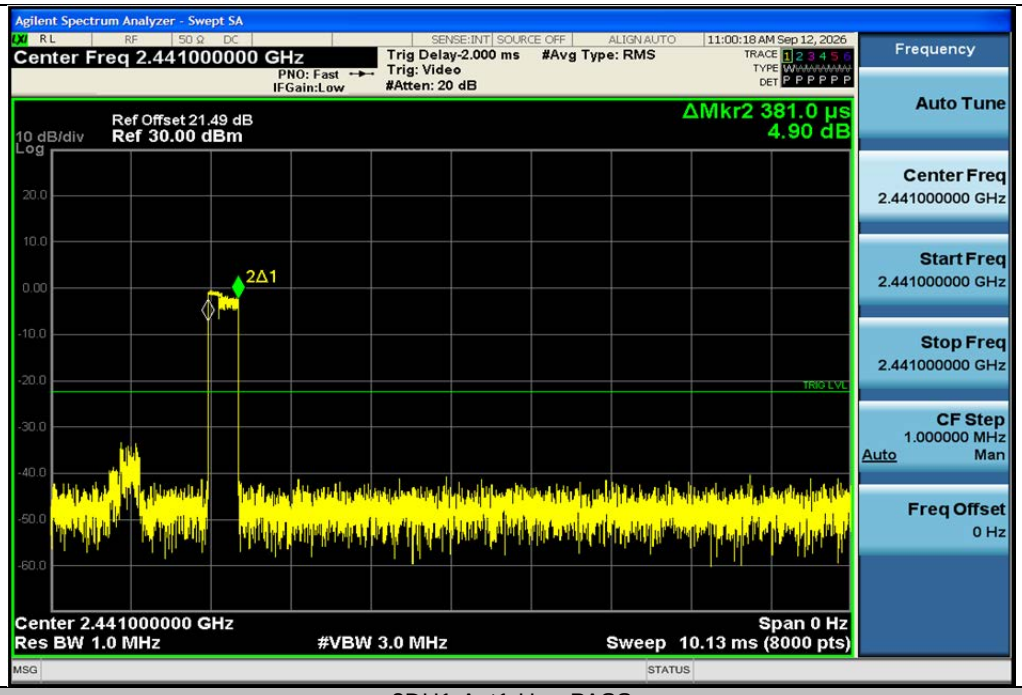

DH1-Ant1-Hop-PASS



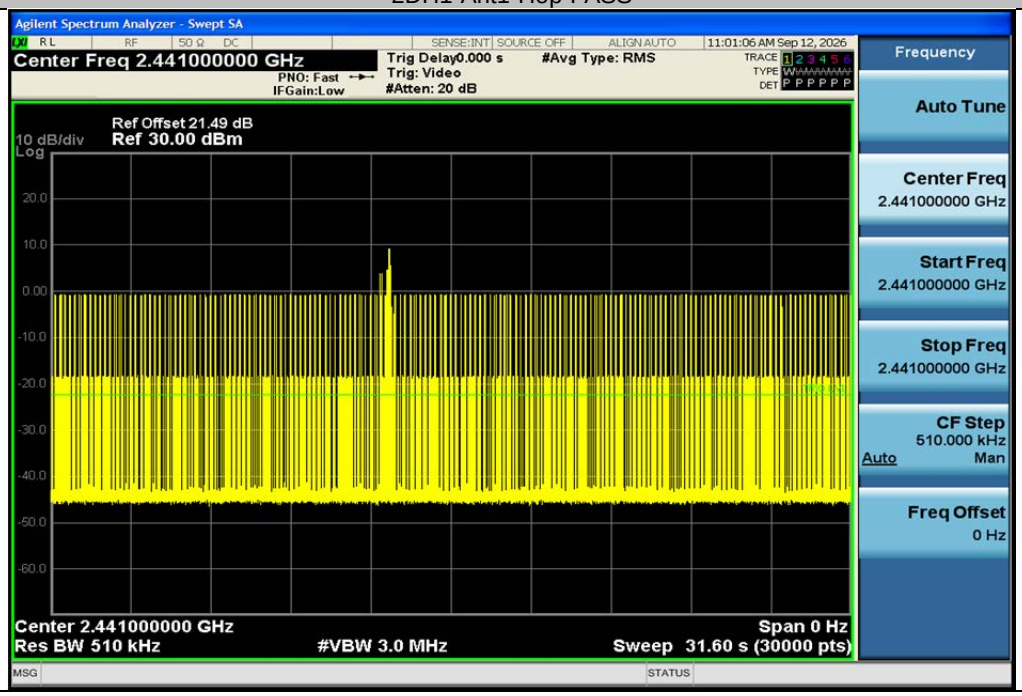

DH3-Ant1-Hop-PASS

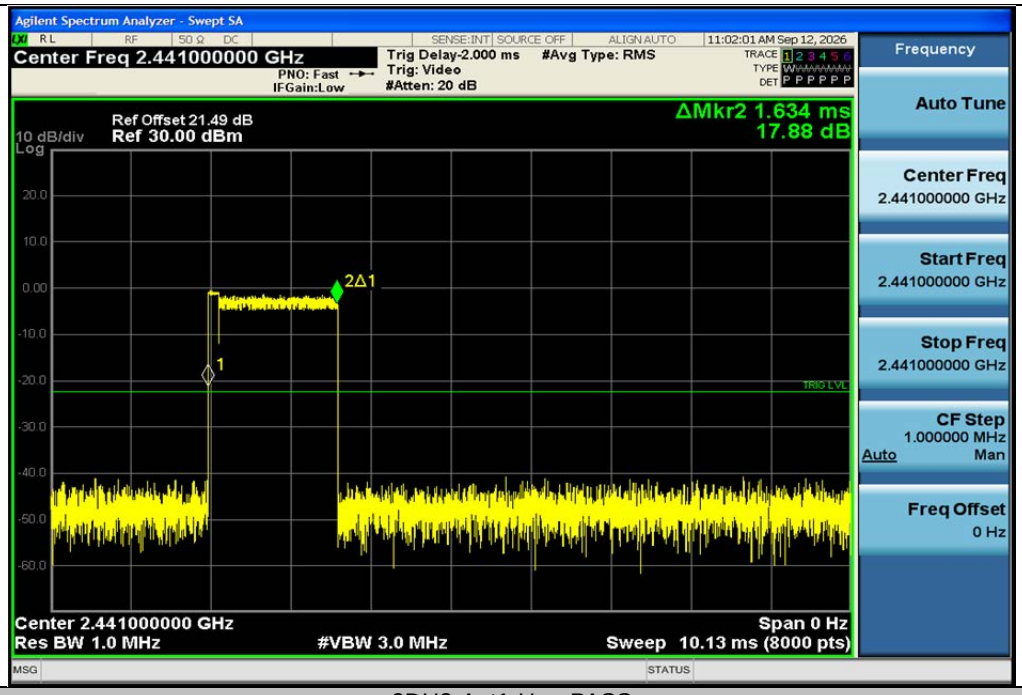



DH5-Ant1-Hop-PASS

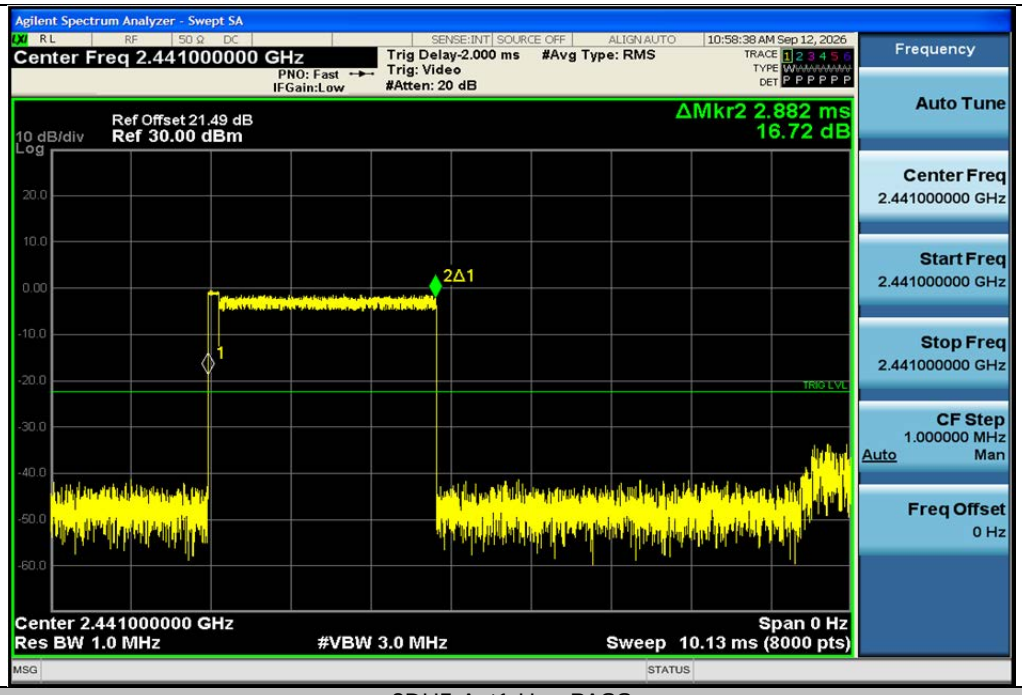



2DH1-Ant1-Hop-PASS

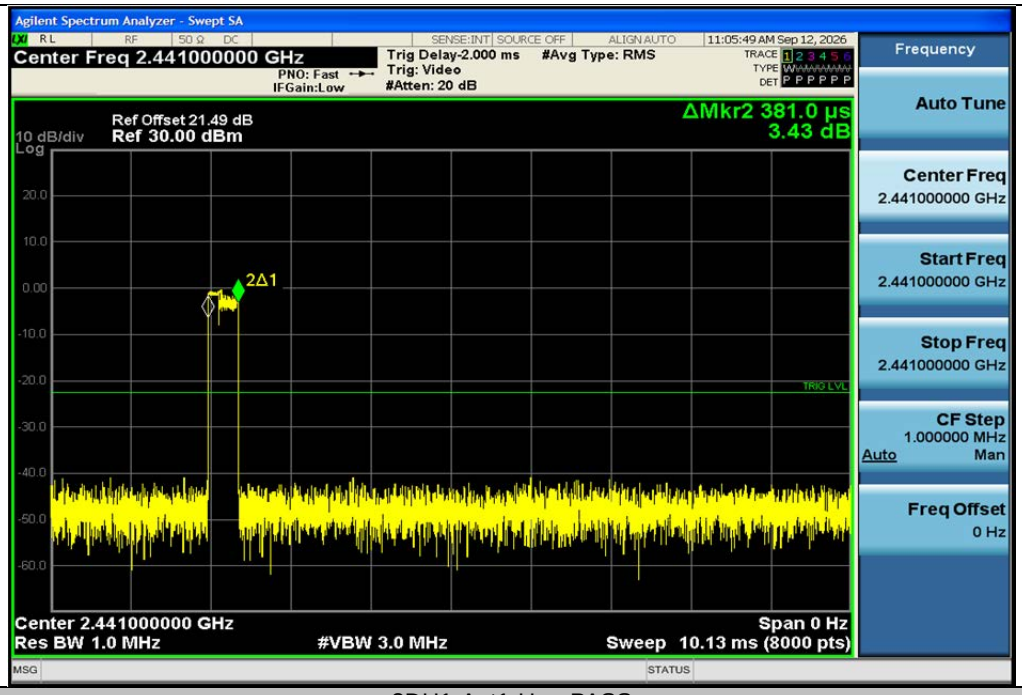





2DH3-Ant1-Hop-PASS

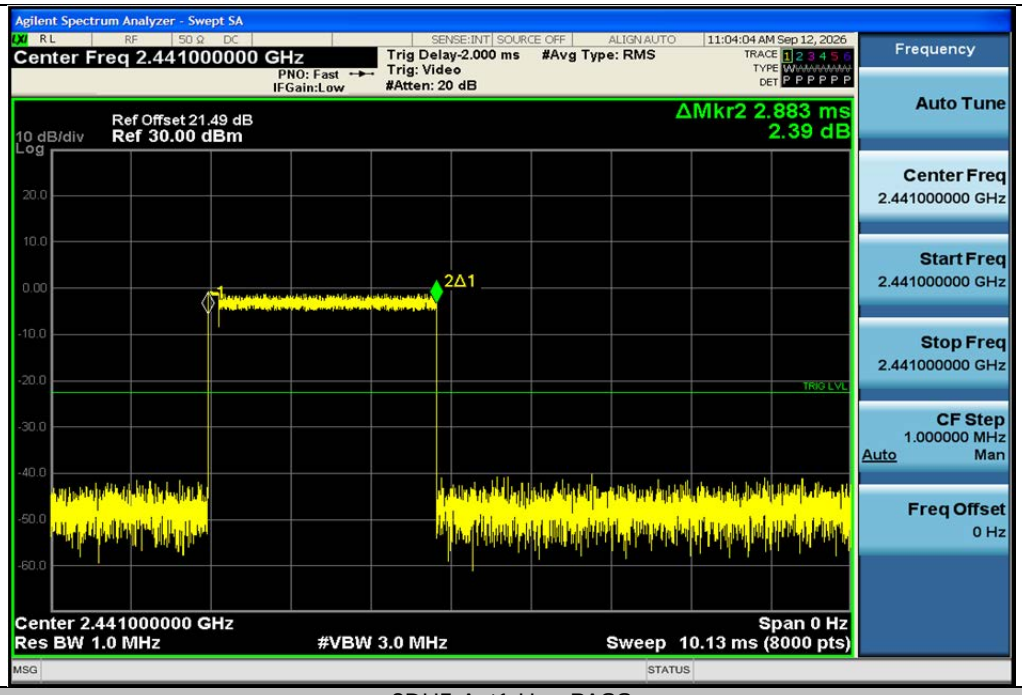



2DH5-Ant1-Hop-PASS




3DH1-Ant1-Hop-PASS


3DH3-Ant1-Hop-PASS




3DH5-Ant1-Hop-PASS

# APPENDIX G - HOPPING CHANNEL SEPARATION

| Test Mode | Antenna | Freq(MHz) | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 1.004 | ≥0.572 | PASS |
| 2DH5 | Ant1 | Hop | 1.44 | ≥0.852 | PASS |
| 3DH5 | Ant1 | Hop | 0.992 | ≥0.886 | PASS |

**Test Graphs**


DH5-Ant1-Hop-PASS


2DH5-Ant1-Hop-PASS


3DH5-Ant1-Hop-PASS

# APPENDIX H - BANDWIDTH

**20dB Emission Bandwidth**

| Test Mode | Antenna | Frequency[MHz] | 20dB EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.807 | 2401.610 | 2402.417 | --- | --- |
| DH5 | Ant1 | 2441 | 0.843 | 2440.571 | 2441.414 | --- | --- |
| DH5 | Ant1 | 2480 | 0.858 | 2479.559 | 2480.417 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.278 | 2401.370 | 2402.648 | --- | --- |
| 2DH5 | Ant1 | 2441 | 1.278 | 2440.367 | 2441.645 | --- | --- |
| 2DH5 | Ant1 | 2480 | 1.272 | 2479.373 | 2480.645 | --- | --- |
| 3DH5 | Ant1 | 2402 | 1.329 | 2401.340 | 2402.669 | --- | --- |
| 3DH5 | Ant1 | 2441 | 1.269 | 2440.361 | 2441.630 | --- | --- |
| 3DH5 | Ant1 | 2480 | 1.287 | 2479.358 | 2480.645 | --- | --- |

**Test Graphs**


DH5-Ant1-2402


DH5-Ant1-2441


DH5-Ant1-2480


2DH5-Ant1-2402


2DH5-Ant1-2441


2DH5-Ant1-2480


3DH5-Ant1-2402

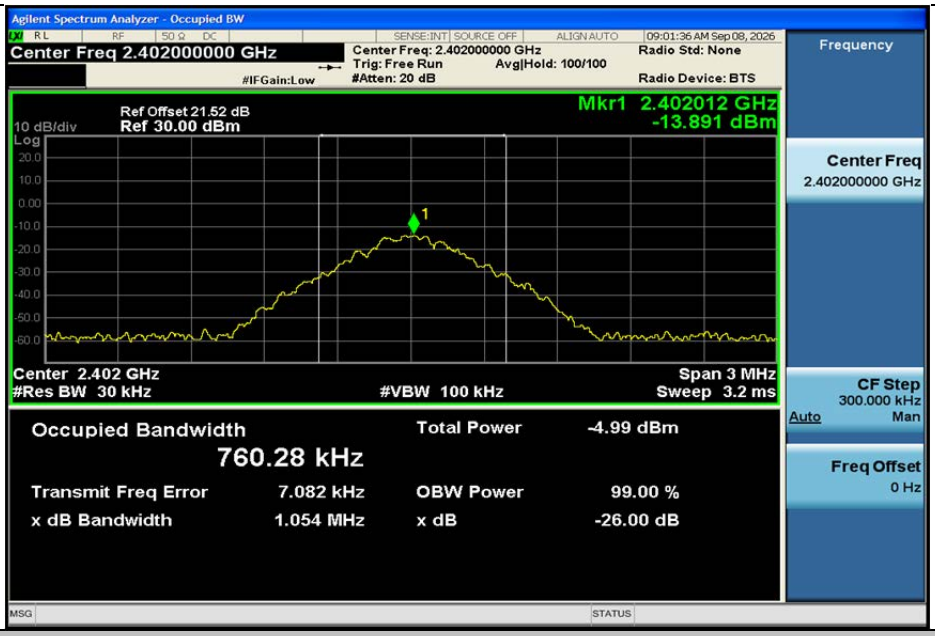

3DH5-Ant1-2441


3DH5-Ant1-2480

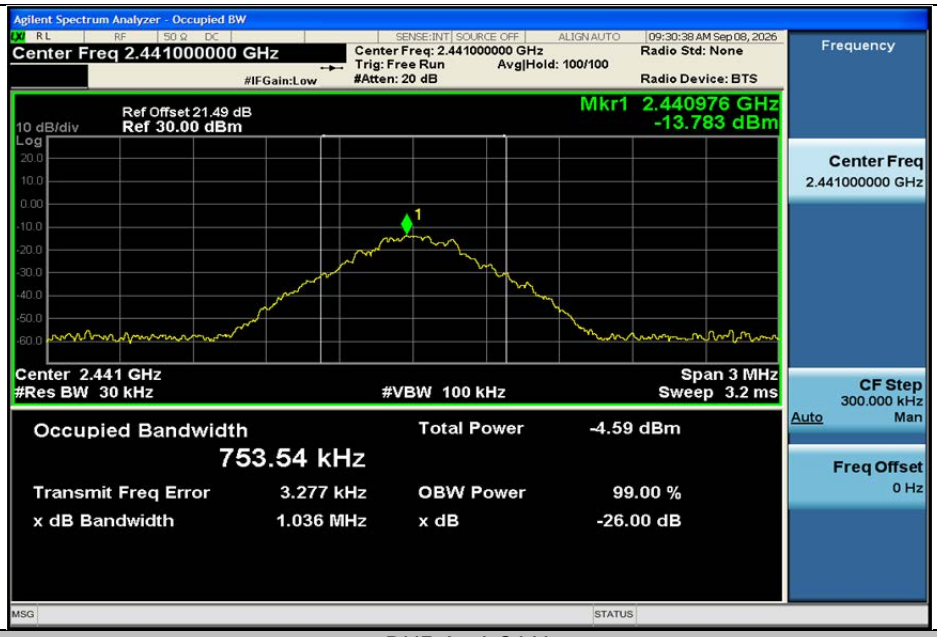
**Occupied Channel Bandwidth**

| Test Mode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.76028 | 2401.6269 | 2402.3872 | --- | --- |
| DH5 | Ant1 | 2441 | 0.75354 | 2440.6265 | 2441.3801 | --- | --- |
| DH5 | Ant1 | 2480 | 0.76464 | 2479.6228 | 2480.3874 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.1674 | 2401.4167 | 2402.5841 | --- | --- |
| 2DH5 | Ant1 | 2441 | 1.1748 | 2440.4139 | 2441.5887 | --- | --- |
| 2DH5 | Ant1 | 2480 | 1.1571 | 2479.4209 | 2480.5780 | --- | --- |
| 3DH5 | Ant1 | 2402 | 1.1828 | 2401.4116 | 2402.5944 | --- | --- |
| 3DH5 | Ant1 | 2441 | 1.1703 | 2440.4200 | 2441.5903 | --- | --- |
| 3DH5 | Ant1 | 2480 | 1.1723 | 2479.4143 | 2480.5866 | --- | --- |

**Test Graphs**

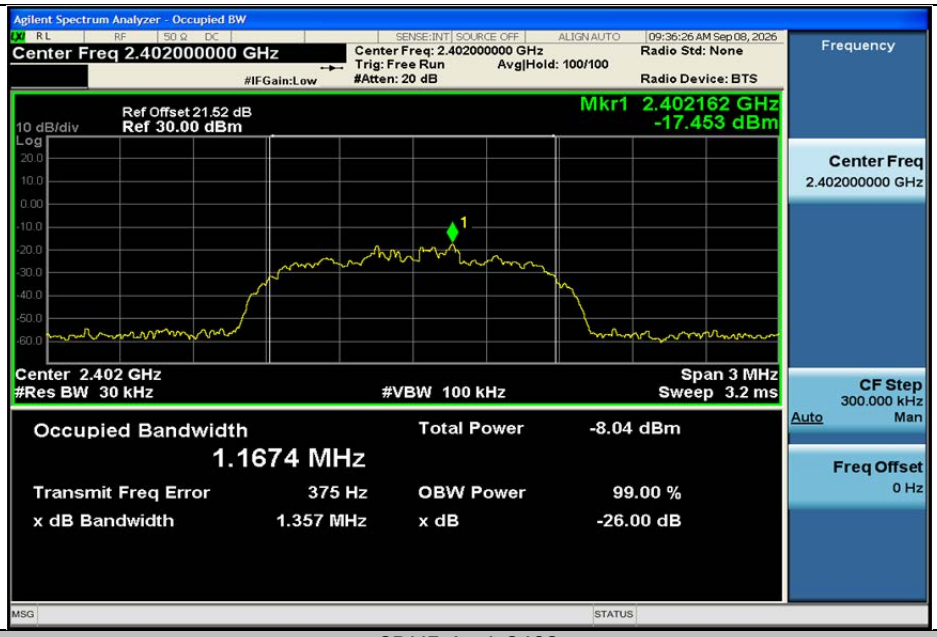



DH5-Ant1-2402

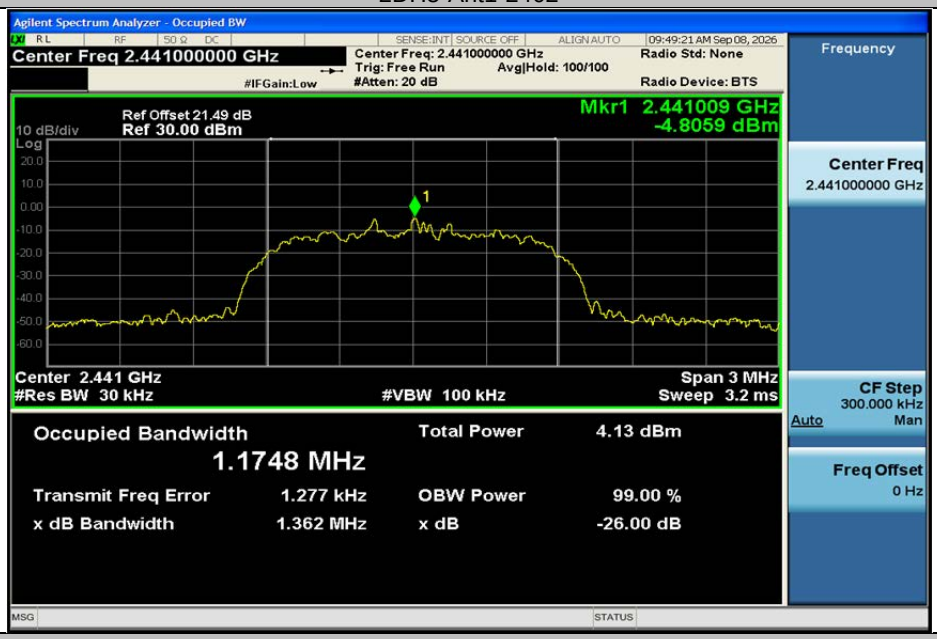



DH5-Ant1-2441

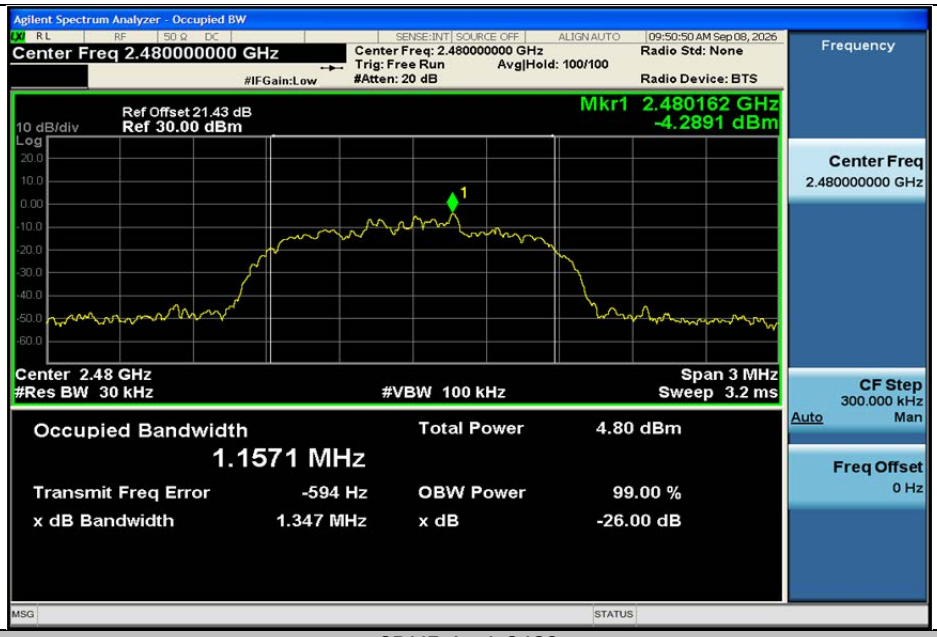

DH5-Ant1-2480



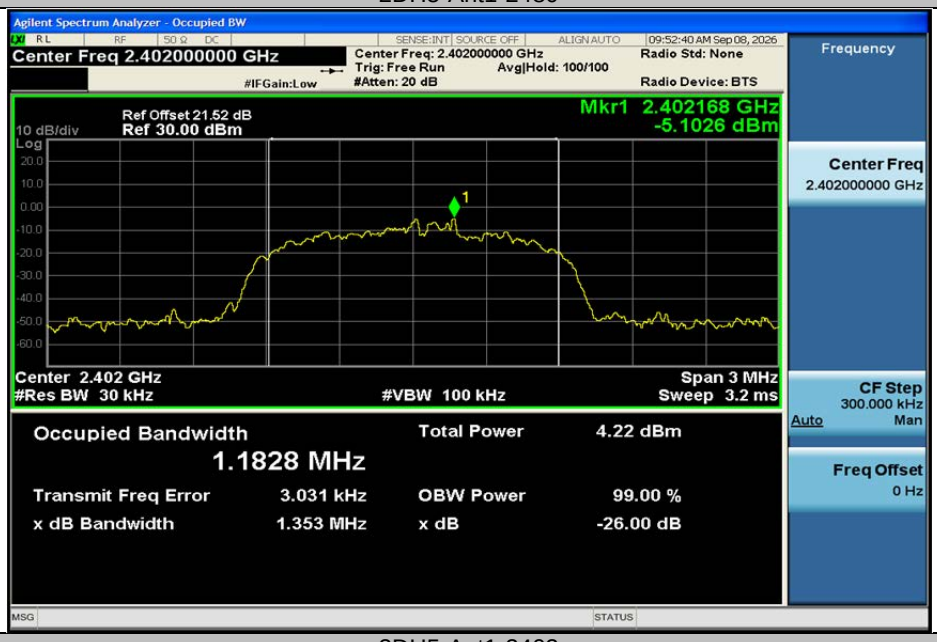

2DH5-Ant1-2402



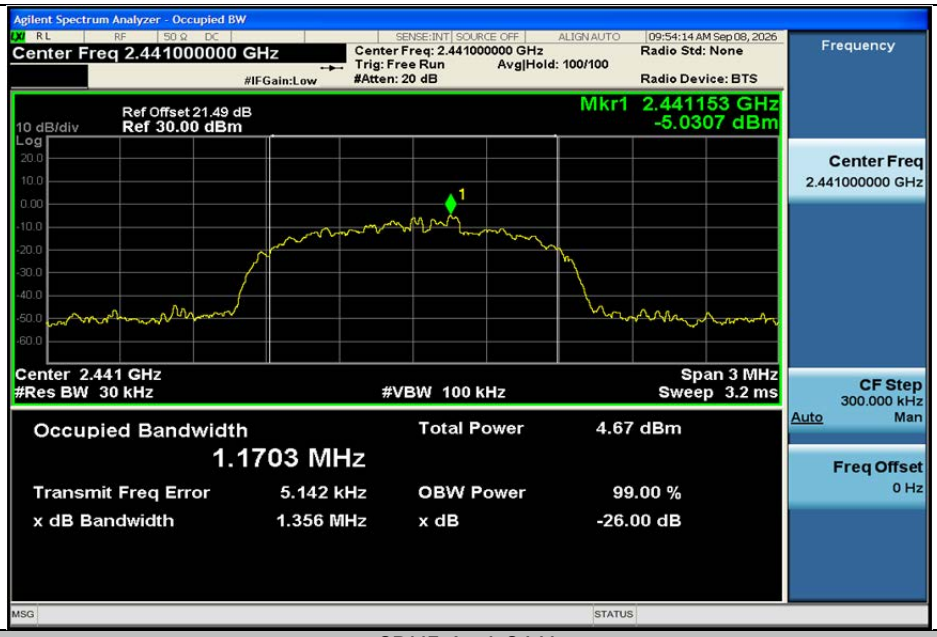

2DH5-Ant1-2441



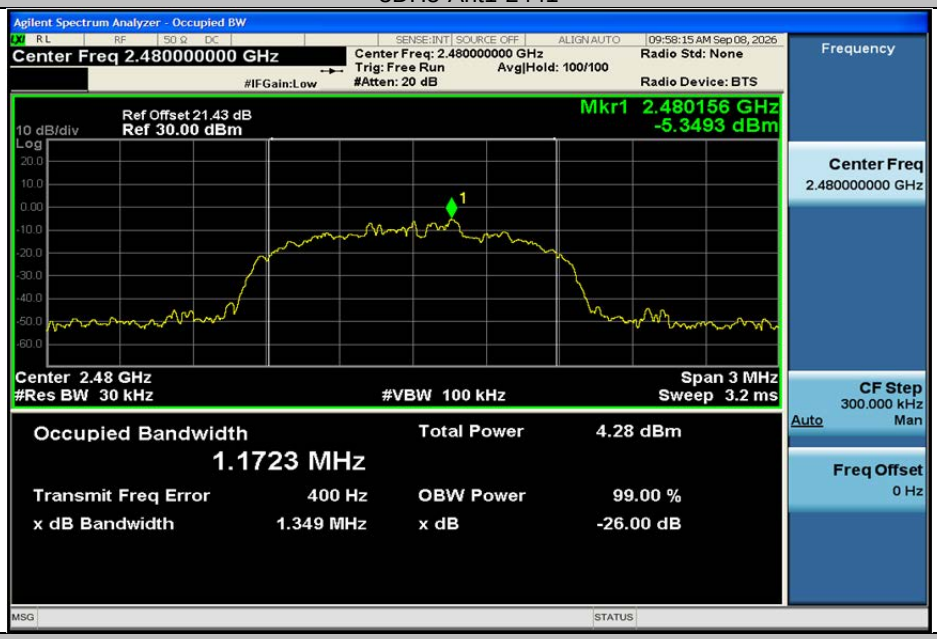

2DH5-Ant1-2480




3DH5-Ant1-2402




3DH5-Ant1-2441




3DH5-Ant1-2480