# Test Report

| | | |
|---|---|---|
| **Report No.** | : | **MTi260811007-0103E1** |
| **Date of issue** | : | **2026-09-14** |
| **Applicant** | : | **ShenZhen DreamCove Tech Co., Ltd** |
| **Product** | : | **Sleep Aid Speaker** |
| **Model(s)** | : | **DC10, Puffi -M, Puffi -W, Puffi -G** |
| **FCC ID** | : | **2BXYE-DC10** |

**Shenzhen Microtest Co., Ltd.**

# TEST REPORT

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| Test Result Certification | |
|---|---|
| Applicant | ShenZhen DreamCove Tech Co., Ltd |
| Applicant Address | Unit 201, Building B7, Western Industrial Factory Zone, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China |
| Manufacturer | ShenZhen DreamCove Tech Co., Ltd |
| Manufacturer Address | Unit 201, Building B7, Western Industrial Factory Zone, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China |
| Factory | ShenZhen DreamCove Tech Co., Ltd |
| Factory Address | Unit 201, Building B7, Western Industrial Factory Zone, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China |
| **Product description** | |
| Product name | Sleep Aid Speaker |
| Trademark | N/A |
| Model name | DC10 |
| Series Model(s) | Puffi -M, Puffi -W, Puffi -G |
| Standards | 47 CFR Part 15.247 |
| Test Method | ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| **Testing Information** | |
| Date of test | 2026-09-04 to 2026-09-14 |
| Test result | Pass |

| | | |
|---|---|---|
| Prepared by: | Happy Cao | Happy Cao |
| Reviewed by: | David Lee | David. Lee |
| Approved by: | Lewis Lian | Lewis Lian |

# 1 General Description

## 1.1 Description of the EUT

| | |
|---|---|
| Product name: | Sleep Aid Speaker |
| Model name: | DC10 |
| Series Model(s): | Puffi -M, Puffi -W, Puffi -G |
| Model difference: | All the models are the same circuit and module, except the model name. |
| Electrical rating: | Input: DC 5V/2A<br>Rated Power: 10W, Battery: 3.7V, 1950mAh |
| Accessories: | Cable:<br>USB-A TO USB-C Cable(0.5m) |
| Hardware version: | JoyHong-5602B(SleepBox)_2026_0706_0855 |
| Software version: | JoyHong-5602B(SleepBox)_2026_0706_0855 |
| Test sample(s) number: | MTi260811007-01-R001 |
| **RF specification** | |
| Bluetooth version: | V6.0 |
| Operating frequency range: | 2402-2480MHz |
| Channel number: | 79 |
| Modulation type: | GFSK,π/4-DQPSK,8DPSK |
| Antenna(s) type: | PCB |
| Antenna(s) gain: | 0dBi |

## 1.2 Description of test modes

| No. | Emission test modes |
|---|---|
| Mode1 | TX-GFSK |
| Mode2 | TX-π/4-DQPSK |
| Mode3 | TX-8DPSK |

### 1.2.1 Operation channel list

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| 0 | 2402 | 20 | 2422 | 40 | 2442 | 60 | 2462 |
| 1 | 2403 | 21 | 2423 | 41 | 2443 | 61 | 2463 |
| 2 | 2404 | 22 | 2424 | 42 | 2444 | 62 | 2464 |
| 3 | 2405 | 23 | 2425 | 43 | 2445 | 63 | 2465 |
| 4 | 2406 | 24 | 2426 | 44 | 2446 | 64 | 2466 |
| 5 | 2407 | 25 | 2427 | 45 | 2447 | 65 | 2467 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | 2408 | 26 | 2428 | 46 | 2448 | 66 | 2468 |
| 7 | 2409 | 27 | 2429 | 47 | 2449 | 67 | 2469 |
| 8 | 2410 | 28 | 2430 | 48 | 2450 | 68 | 2470 |
| 9 | 2411 | 29 | 2431 | 49 | 2451 | 69 | 2471 |
| 10 | 2412 | 30 | 2432 | 50 | 2452 | 70 | 2472 |
| 11 | 2413 | 31 | 2433 | 51 | 2453 | 71 | 2473 |
| 12 | 2414 | 32 | 2434 | 52 | 2454 | 72 | 2474 |
| 13 | 2415 | 33 | 2435 | 53 | 2455 | 73 | 2475 |
| 14 | 2416 | 34 | 2436 | 54 | 2456 | 74 | 2476 |
| 15 | 2417 | 35 | 2437 | 55 | 2457 | 75 | 2477 |
| 16 | 2418 | 36 | 2438 | 56 | 2458 | 76 | 2478 |
| 17 | 2419 | 37 | 2439 | 57 | 2459 | 77 | 2479 |
| 18 | 2420 | 38 | 2440 | 58 | 2460 | 78 | 2480 |
| 19 | 2421 | 39 | 2441 | 59 | 2461 | - | - |

**1.2.2**

**Test Channel List**

**Operation Band: 2400-2483.5 MHz**

| Bandwidth (MHz) | Lowest Channel (LCH) (MHz) | Middle Channel (MCH) (MHz) | Highest Channel (HCH) (MHz) |
|---|---|---|---|
| 1 | 2402 | 2441 | 2480 |

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

**Test Software: BT_Tool 1.1.2**

For power setting, refer to below table.

| Mode | 2402MHz | 2441MHz | 2480MHz |
|---|---|---|---|
| GFSK | 0 | 0 | 0 |
| π/4-DQPSK | 0 | 0 | 0 |
| 8DPSK | 0 | 0 | 0 |

## 1.3 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature: | 15°C ~ 35°C |
| Humidity: | 20% RH ~ 75% RH |
| Atmospheric pressure: | 98 kPa ~ 101 kPa |

## 1.4 Description of support units

| **Support equipment list** | | | |
|---|---|---|---|
| Description | Model | Serial No. | Manufacturer |
| USB-A HUAWEI CHARGE (10W) | HW-050200C02 | K95212KA103561 | HUAWEI |
| **Support cable list** | | | |
| Description | Length (m) | From | To |
| / | / | / | / |

## 1.5 Measurement uncertainty

| Measurement | Uncertainty |
|---|---|
| Conducted emissions (AMN 150kHz~30MHz) | ±3.1dB |
| Occupied channel bandwidth | ±3 % |
| RF output power, conducted | ±1 dB |
| Time | ±1 % |
| Unwanted Emissions, conducted | ±1 dB |
| Radiated spurious emissions (above 1GHz) | ±5.3dB |
| Radiated spurious emissions (9kHz~30MHz) | ±4.3dB |
| Radiated spurious emissions (30MHz~1GHz) | ±4.7dB |
| Temperature | ±1 °C |
| Humidity | ± 5 % |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2 Summary of Test Result

| No. | Item | Standard | Requirement | Result |
|---|---|---|---|---|
| 1 | Antenna requirement | 47 CFR Part 15.247 | 47 CFR 15.203 | Pass |
| 2 | Conducted Emission at AC power line | 47 CFR Part 15.247 | 47 CFR 15.207(a) | Pass |
| 3 | 20dB Bandwidth | 47 CFR Part 15.247 | 47 CFR 15.247(a)(1) | Pass |
| 4 | Maximum Conducted Output Power | 47 CFR Part 15.247 | 47 CFR 15.247(b)(1) | Pass |
| 5 | Channel Separation | 47 CFR Part 15.247 | 47 CFR 15.247(a)(1) | Pass |
| 6 | Number of Hopping Frequencies | 47 CFR Part 15.247 | 47 CFR 15.247(a)(1)(iii) | Pass |
| 7 | Dwell Time | 47 CFR Part 15.247 | 47 CFR 15.247(a)(1)(iii) | Pass |
| 8 | RF conducted spurious emissions and band edge measurement | 47 CFR Part 15.247 | 47 CFR 15.247(d) | Pass |
| 9 | Band edge emissions (Radiated) | 47 CFR Part 15.247 | 47 CFR 15.247(d), 15.209, 15.205 | Pass |
| 10 | Radiated emissions (below 1GHz) | 47 CFR Part 15.247 | 47 CFR 15.247(d), 15.209, 15.205 | Pass |
| 11 | Radiated emissions (above 1GHz) | 47 CFR Part 15.247 | 47 CFR 15.247(d), 15.209, 15.205 | Pass |

# 3 Test Facilities and accreditations

## 3.1 Test laboratory

| | |
|---|---|
| Test laboratory: | Shenzhen Microtest Co., Ltd. |
| Test site location: | 101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| Telephone: | (86-755)88850135 |
| Fax: | (86-755)88850136 |
| CNAS Registration No.: | CNAS L5868 |
| FCC Registration No.: | 448573 |
| IC Registration No.: | 21760 |
| CABID: | CN0093 |

## 4 List of test equipment

| No. | Equipment | Manufacturer | Model | Serial No. | Cal. date | Cal. Due |
|---|---|---|---|---|---|---|
| Conducted Emission at AC power line | | | | | | |
| 1 | EMI Test Receiver | Rohde&schwarz | ESCI3 | 101368 | 2026-03-10 | 2027-03-09 |
| 2 | Artificial mains network | Schwarzbeck | NSLK 8127 | 183 | 2026-03-11 | 2027-03-10 |
| 3 | Artificial Mains Network | Rohde & Schwarz | ESH2-Z5 | 100263 | 2026-03-10 | 2027-03-09 |
| 4 | EMI Test Software | Farad | EZ-EMC | Ver. EMEC-3A1 | / | / |
| Dwell Time<br>Emissions in non-restricted frequency bands<br>20dB Bandwidth<br>Maximum Conducted Output Power<br>Channel Separation<br>Number of Hopping Frequencies | | | | | | |
| 1 | Wideband Radio Communication Tester | Rohde&schwarz | CMW500 | 149155 | 2026-03-09 | 2027-03-08 |
| 2 | ESG Series Analog Ssignal Generator | Agilent | E4421B | GB40051240 | 2026-03-09 | 2027-03-08 |
| 3 | PXA Signal Analyzer | Agilent | N9030A | MY51350296 | 2026-03-10 | 2027-03-09 |
| 4 | Synthesized Sweeper | Agilent | 83752A | 3610A01957 | 2026-03-10 | 2027-03-09 |
| 5 | MXA Signal Analyzer | Agilent | N9020A | MY50143483 | 2026-03-09 | 2027-03-08 |
| 6 | RF Control Unit | Tonscend | JS0806-1 | 19D8060152 | 2026-03-11 | 2027-03-10 |
| 7 | Band Reject Filter Group | Tonscend | JS0806-F | 19D8060160 | 2026-03-11 | 2027-03-10 |
| 8 | ESG Vector Signal Generator | Agilent | N5182A | MY50143762 | 2026-03-10 | 2027-03-09 |
| 9 | DC Power Supply | Agilent | E3632A | MY40027695 | 2026-03-09 | 2027-03-08 |
| 10 | RF Test System | Tonscend | JS1120-3 Test System | V3.6.21 | / | / |
| Band edge emissions (Radiated)<br>Emissions in frequency bands (above 1GHz) | | | | | | |
| 1 | EMI Test Receiver | Rohde&schwarz | ESCI7 | 101166 | 2026-03-10 | 2027-03-09 |
| 2 | Double Ridged Broadband Horn Antenna | schwarabeck | BBHA 9120 D | 2278 | 2025-05-27 | 2027-05-26 |
| 3 | Amplifier | Agilent | 8449B | 3008A01120 | 2026-03-10 | 2027-03-09 |
| 4 | MXA signal analyzer | Agilent | N9020A | MY54440859 | 2026-03-10 | 2027-03-09 |
| 5 | PXA Signal Analyzer | Agilent | N9030A | MY51350296 | 2026-03-10 | 2027-03-09 |
| 6 | Horn antenna | Schwarzbeck | BBHA 9170 | 00987 | 2025-05-27 | 2027-05-26 |

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| No. | Equipment | Manufacturer | Model | Serial No. | Cal. date | Cal. Due |
|---|---|---|---|---|---|---|
| 7 | Pre-amplifier | Space-Dtronics | EWLAN1840G | 210405001 | 2026-03-11 | 2027-03-10 |
| 8 | EMI Test Software | Farad | EZ-EMC | Ver. EMEC-3A1 | / | / |
| Emissions in frequency bands (below 1GHz) | | | | | | |
| 1 | EMI Test Receiver | Rohde&schwarz | ESCI7 | 101166 | 2026-03-10 | 2027-03-09 |
| 2 | TRILOG Broadband Antenna | schwarabeck | VULB 9163 | 9163-1338 | 2025-05-23 | 2027-05-22 |
| 3 | Active Loop Antenna | Schwarzbeck | FMZB 1519 B | 00066 | 2026-03-08 | 2028-03-07 |
| 4 | Amplifier | Hewlett-Packard | 8447F | 3113A06184 | 2026-03-10 | 2027-03-09 |
| 5 | EMI Test Software | Farad | EZ-EMC | Ver. EMEC-3A1 | / | / |

# 5 Evaluation Results (Evaluation)

## 5.1 Antenna requirement

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. |
| Test Method: | --- |

### 5.1.1 Conclusion:

| |
|---|
| The antenna of the EUT is permanently attached.<br>The EUT complies with the requirement of FCC PART 15.203. |

## 6 Radio Spectrum Matter Test Results (RF)

### 6.1 Conducted Emission at AC power line

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). |
| Test Limit: | |

| Frequency of emission (MHz) | Conducted limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

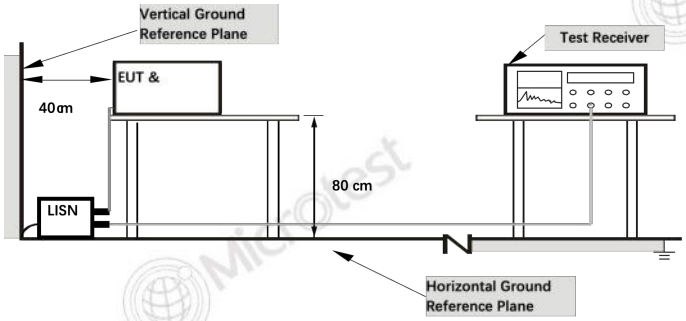
*Decreases with the logarithm of the frequency.

| | |
|---|---|
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.2 |
| Procedure: | Refer to ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices |

#### 6.1.1 E.U.T. Operation:

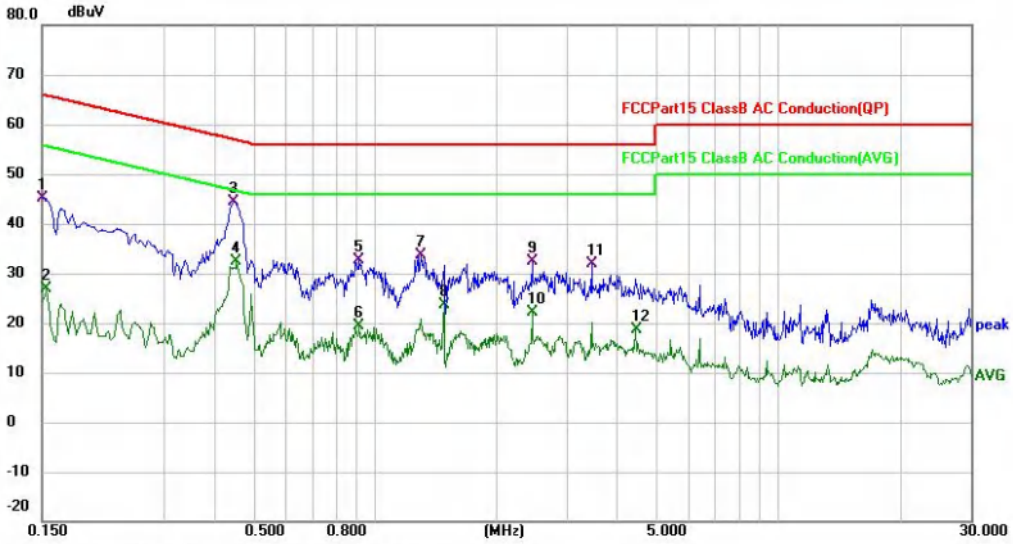
| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 22.2 °C | Humidity: | 59 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | All of the listed pre-test mode were tested, only the data of the worst mode (Mode1) is recorded in the report | | | | |

#### 6.1.2 Test Setup Diagram:



### 6.1.3 Test Data:

Mode1 / Line: Line / CH: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1500 | 34.64 | 10.48 | 45.12 | 66.00 | -20.88 | QP | |
| 2 | | 0.1539 | 16.40 | 10.49 | 26.89 | 55.79 | -28.90 | AVG | |
| 3 | * | 0.4460 | 33.82 | 10.55 | 44.37 | 56.95 | -12.58 | QP | |
| 4 | | 0.4540 | 21.74 | 10.55 | 32.29 | 46.80 | -14.51 | AVG | |
| 5 | | 0.9140 | 22.07 | 10.62 | 32.69 | 56.00 | -23.31 | QP | |
| 6 | | 0.9140 | 8.83 | 10.62 | 19.45 | 46.00 | -26.55 | AVG | |
| 7 | | 1.2980 | 23.09 | 10.66 | 33.75 | 56.00 | -22.25 | QP | |
| 8 | | 1.4819 | 12.83 | 10.68 | 23.51 | 46.00 | -22.49 | AVG | |
| 9 | | 2.4700 | 21.68 | 10.76 | 32.44 | 56.00 | -23.56 | QP | |
| 10 | | 2.4700 | 11.43 | 10.76 | 22.19 | 46.00 | -23.81 | AVG | |
| 11 | | 3.4580 | 21.02 | 10.77 | 31.79 | 56.00 | -24.21 | QP | |
| 12 | | 4.4420 | 7.88 | 10.78 | 18.66 | 46.00 | -27.34 | AVG | |

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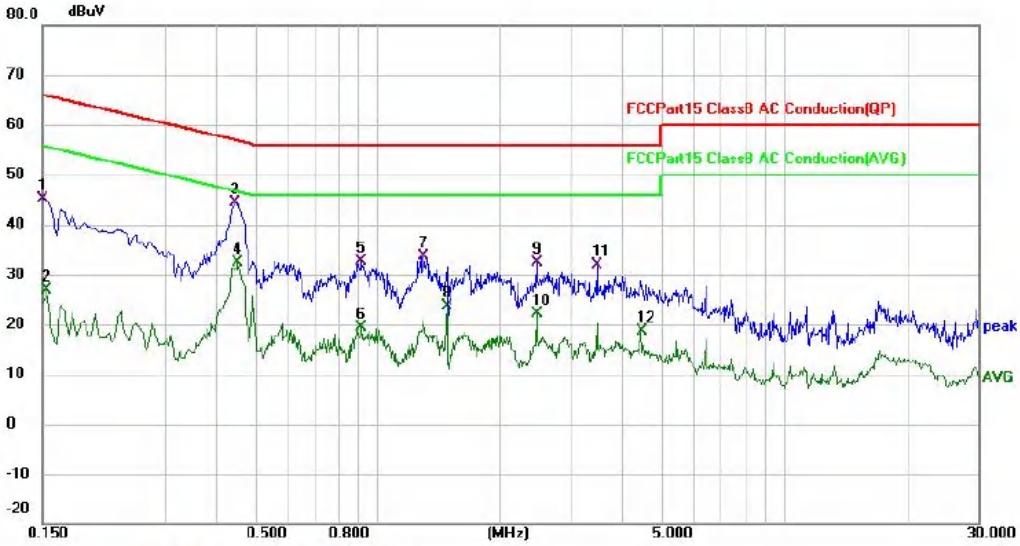
Mode1 / Line: Neutral / CH: L




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1500 | 34.64 | 10.48 | 45.12 | 66.00 | -20.88 | QP | |
| 2 | | 0.1539 | 16.40 | 10.49 | 26.89 | 55.79 | -28.90 | AVG | |
| 3 | * | 0.4460 | 33.82 | 10.55 | 44.37 | 56.95 | -12.58 | QP | |
| 4 | | 0.4540 | 21.74 | 10.55 | 32.29 | 46.80 | -14.51 | AVG | |
| 5 | | 0.9140 | 22.07 | 10.62 | 32.69 | 56.00 | -23.31 | QP | |
| 6 | | 0.9140 | 8.83 | 10.62 | 19.45 | 46.00 | -26.55 | AVG | |
| 7 | | 1.2980 | 23.09 | 10.66 | 33.75 | 56.00 | -22.25 | QP | |
| 8 | | 1.4819 | 12.83 | 10.68 | 23.51 | 46.00 | -22.49 | AVG | |
| 9 | | 2.4700 | 21.68 | 10.76 | 32.44 | 56.00 | -23.56 | QP | |
| 10 | | 2.4700 | 11.43 | 10.76 | 22.19 | 46.00 | -23.81 | AVG | |
| 11 | | 3.4580 | 21.02 | 10.77 | 31.79 | 56.00 | -24.21 | QP | |
| 12 | | 4.4420 | 7.88 | 10.78 | 18.66 | 46.00 | -27.34 | AVG | |

## 6.2 20dB Bandwidth

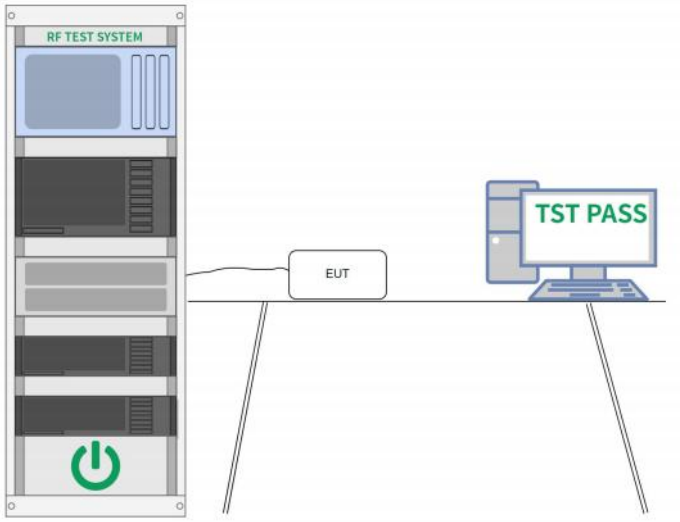
| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(a)(1) |
| Test Limit: | Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, section 7.8.6, For occupied bandwidth measurements, use the procedure in 6.9.2. Frequency hopping shall be disabled for this test.<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | A dBc bandwidth is measured as the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio (or in decibels, a specified number of dB down from the reference value). Typical ratios, expressed in dB, are −6 dB, −20 dB, and −26 dB, corresponding to 6 dB BW, 20 dB BW, and 26 dB BW, respectively. In this subclause, the ratio is designated by "−xx dB." The reference value is either the level of the unmodulated carrier or the highest level of the spectral envelope of the modulated signal, as stated by the applicable requirement. Some requirements might specify a specific maximum or minimum value for the "−xx dB" bandwidth; other requirements might specify that the "−xx dB" bandwidth be entirely contained within the authorized or designated frequency band.51<br>a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.<br>b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be at least three times RBW, unless otherwise specified by the applicable requirement.<br>c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.6.2.<br>d) Steps a) through c) might require iteration to adjust within the specified tolerances.<br>e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.<br>f) Set detection mode to peak and trace mode to max-hold.<br>g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).<br>h) Determine the "−xx dB down amplitude" using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.<br>i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace |

| | |
|---|---|
| | from step g) shall be used for step j).<br>j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The dBc bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "−xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.<br>k) The dBc bandwidth shall be reported by providing spectral plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s). |

### 6.2.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.2.2 Test Setup Diagram:




### 6.2.3 Test Data:

Please Refer to Appendix for Details.

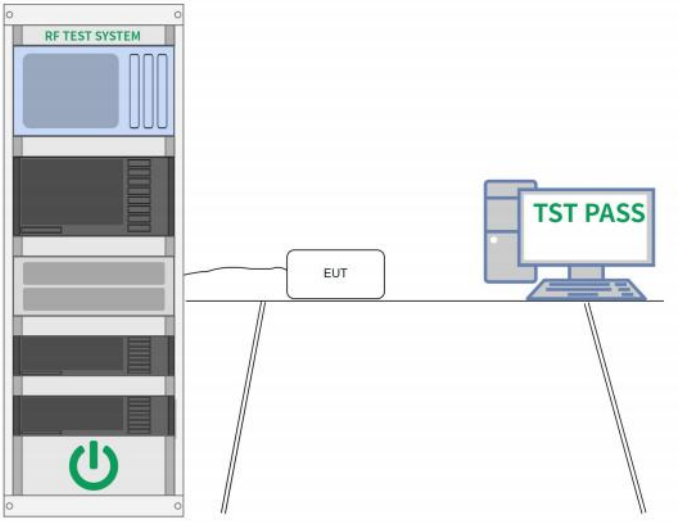
## 6.3 Maximum Conducted Output Power

| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(b)(1) |
| Test Limit: | Refer to 47 CFR 15.247(b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, section 7.8.5<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |

### 6.3.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.3.2 Test Setup Diagram:




### 6.3.3 Test Data:

Please Refer to Appendix for Details.

## 6.4 Channel Separation

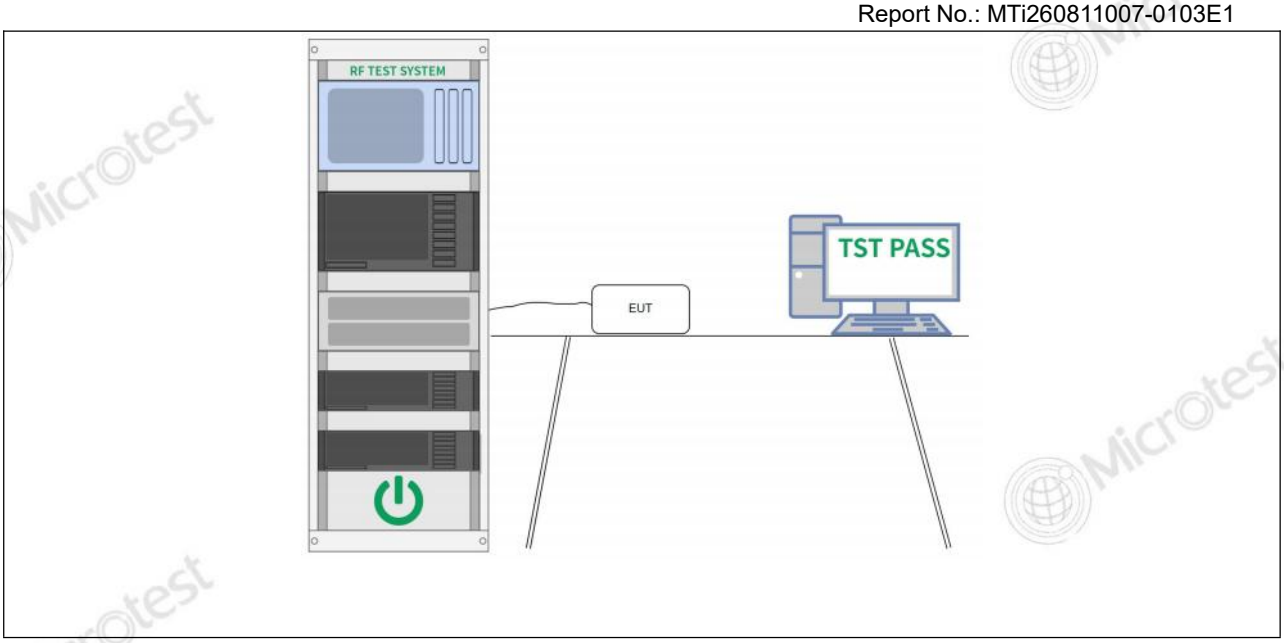
| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(a)(1) |
| Test Limit: | Refer to 47 CFR 15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency 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. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, section 7.8.2<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:<br>a) Span: Wide enough to capture the peaks of two adjacent channels.<br>b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.<br>c) Video (or average) bandwidth (VBW) ≥ RBW.<br>d) Sweep: No faster than coupled (auto) time.<br>e) Detector function: Peak.<br>f) Trace: Max-hold.<br>g) Allow the trace to stabilize.<br><br>Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A spectral plot of the data shall be included in the test report. |

### 6.4.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.4.2 Test Setup Diagram:

| |
|---|
| |




### 6.4.3 Test Data:

Please Refer to Appendix for Details.

## 6.5 Number of Hopping Frequencies

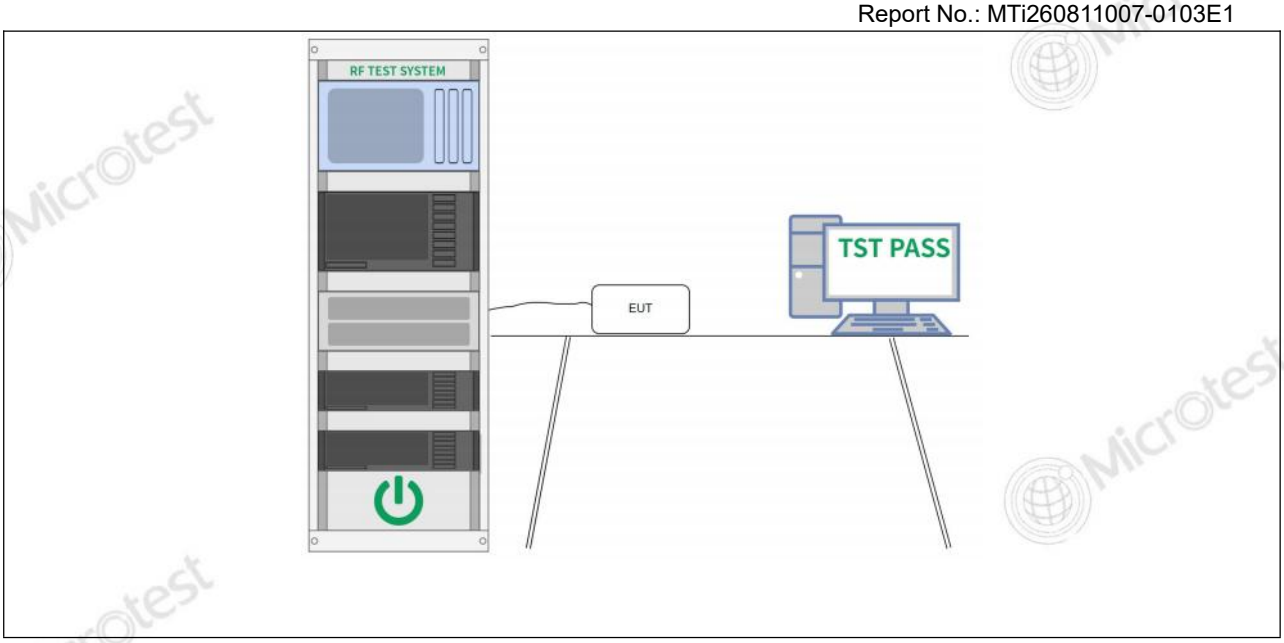
| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(a)(1)(iii) |
| Test Limit: | Refer to 47 CFR 15.247(a)(1)(iii), Fequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, section 7.8.3<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:<br>a) Span: The frequency band of operation. Depending on the number of channels the device supports, it could be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.<br>b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.<br>c) VBW ≥ RBW.<br>d) Sweep: No faster than coupled (auto) time.<br>e) Detector function: Peak.<br>f) Trace: Max-hold.<br>g) Allow the trace to stabilize.<br><br>It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A spectral plot of the data shall be included in the test report. |

### 6.5.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.5.2 Test Setup Diagram:

| |
|---|
| |




### 6.5.3 Test Data:

Please Refer to Appendix for Details.

## 6.6 Dwell Time

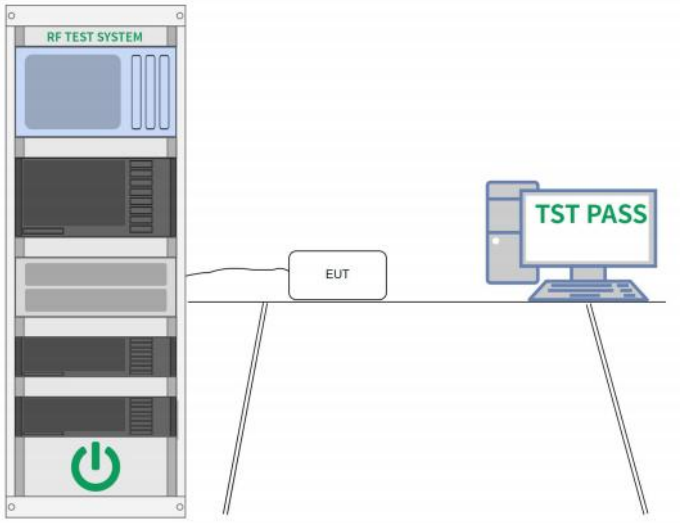
| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(a)(1)(iii) |
| Test Limit: | Refer to 47 CFR 15.247(a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, section 7.8.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | The dwell time per hop on a channel is the time from the start of the first transmission to the end of the last transmission for that hop. If the device has a single transmission per hop then the dwell time is the duration of that transmission. If the device has a multiple transmissions per hop then the dwell time is measured from the start of the first transmission to the end of the last transmission.<br><br>The time of occupancy is the total time that the device dwells on a channel over an observation period specified in the regulatory requirement. To determine the time of occupancy the spectrum analyzer will be configured to measure both the dwell time per hop and the number of times the device transmits on a specific channel in a given period.<br><br>The EUT shall have its hopping function enabled. Compliance with the requirements shall be made with the minimum and with the maximum number of channels enabled. If the dwell time per channel does not vary with the number of channels than compliance with the requirements may be based on the minimum number of channels. If the device supports different dwell times per channel (example Bluetooth devices can dwell on a channel for 1, 3 or 5 time slots) then measurements can be limited to the longest dwell time with the minimum number of channels.<br><br>Use the following spectrum analyzer settings to determine the dwell time per hop:<br><br>a) Span: Zero span, centered on a hopping channel.<br>b) RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected transmission time per hop.<br>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.<br>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.<br>e) Detector function: Peak.<br>f) Trace: Clear-write, single sweep.<br>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.<br><br>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.<br><br>The average time of occupancy is calculated by multiplying the dwell time per hop by the number of hops in the observation period. |

### 6.6.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.6.2 Test Setup Diagram:




### 6.6.3 Test Data:

Please Refer to Appendix for Details.

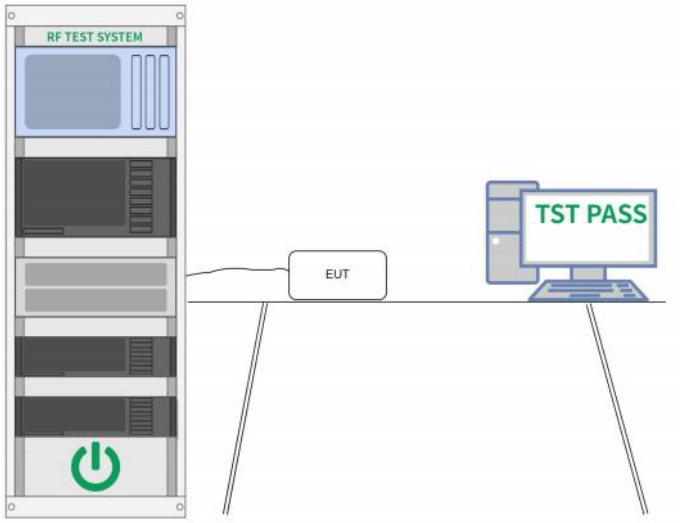
## 6.7 RF conducted spurious emissions and band edge measurement

| | |
|---|---|
| Test Requirement: | 47 CFR 15.247(d) |
| Test Limit: | Refer to 47 CFR 15.247(d), 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 conducted power limits. If the transmitter complies with the conducted 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 § 15.209(a) is not required. |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 7.8.7<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |

### 6.7.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 25.1 °C | Humidity: | 47 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | Mode1, Mode2, Mode3 | | | | |

### 6.7.2 Test Setup Diagram:




### 6.7.3 Test Data:

Please Refer to Appendix for Details.

## 6.8 Band edge emissions (Radiated)

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR 15.247(d), 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)(see § 15.205(c)). |
| Test Limit: | |

| 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 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

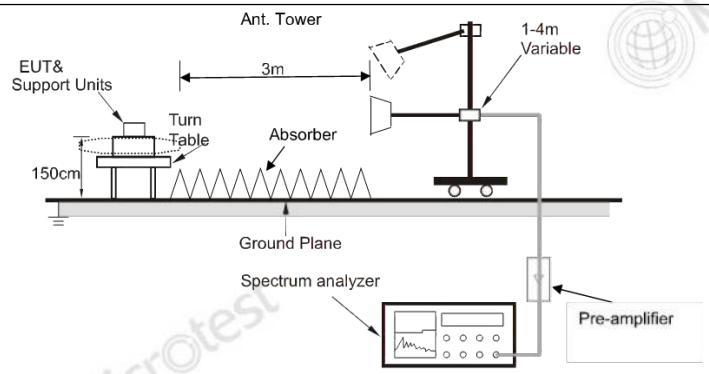
| | |
|---|---|
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.10<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.10.5.2 |

### 6.8.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 23.4 °C | Humidity: | 45.1 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report | | | | |

Note:
The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.

### 6.8.2 Test Setup Diagram:



### 6.8.3 Test Data:

Mode3 / Polarization: Horizontal / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2310.000 | 48.27 | -4.50 | 43.77 | 74.00 | -30.23 | peak |
| 2 | | 2310.000 | 38.59 | -4.50 | 34.09 | 54.00 | -19.91 | AVG |
| 3 | | 2390.000 | 48.65 | -4.31 | 44.34 | 74.00 | -29.66 | peak |
| 4 | * | 2390.000 | 38.91 | -4.31 | 34.60 | 54.00 | -19.40 | AVG |

Mode3 / Polarization: Vertical / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2310.000 | 48.72 | -4.50 | 44.22 | 74.00 | -29.78 | peak |
| 2 | | 2310.000 | 38.76 | -4.50 | 34.26 | 54.00 | -19.74 | AVG |
| 3 | | 2390.000 | 48.68 | -4.31 | 44.37 | 74.00 | -29.63 | peak |
| 4 | * | 2390.000 | 39.24 | -4.31 | 34.93 | 54.00 | -19.07 | AVG |

Mode3 / Polarization: Horizontal / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2483.500 | 55.53 | -4.23 | 51.30 | 74.00 | -22.70 | peak |
| 2 | * | 2483.500 | 42.21 | -4.23 | 37.98 | 54.00 | -16.02 | AVG |
| 3 | | 2500.000 | 48.81 | -4.15 | 44.66 | 74.00 | -29.34 | peak |
| 4 | | 2500.000 | 39.02 | -4.15 | 34.87 | 54.00 | -19.13 | AVG |

Mode3 / Polarization: Vertical / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 2483.500 | 50.36 | -4.23 | 46.13 | 74.00 | -27.87 | peak |
| 2 | * | 2483.500 | 40.00 | -4.23 | 35.77 | 54.00 | -18.23 | AVG |
| 3 | | 2500.000 | 50.30 | -4.15 | 46.15 | 74.00 | -27.85 | peak |
| 4 | | 2500.000 | 39.22 | -4.15 | 35.07 | 54.00 | -18.93 | AVG |

## 6.9 Radiated emissions (below 1GHz)

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR 15.247(d), 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)(see § 15.205(c)). |
| Test Limit: | |

| 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 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

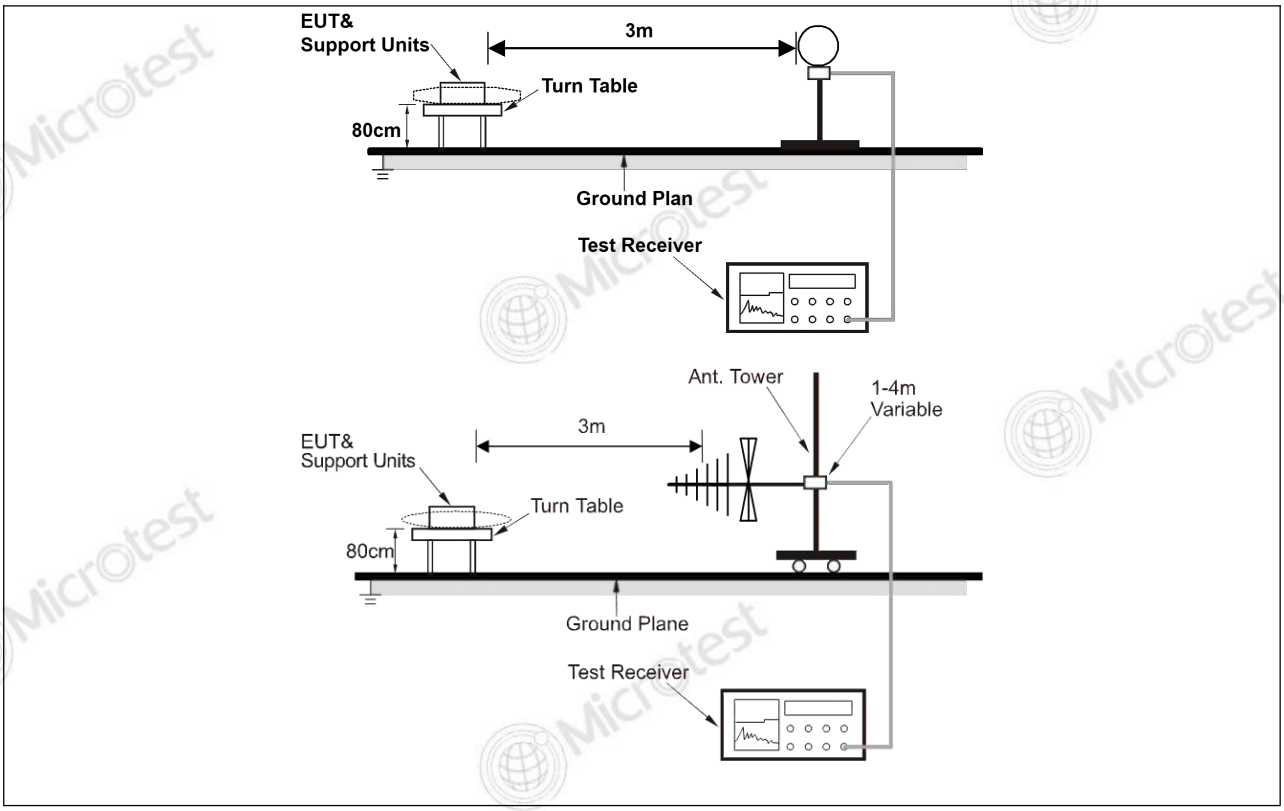
| | |
|---|---|
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.5.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.5.4 |

### 6.9.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 23.4 °C | Humidity: | 45.1 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report | | | | |

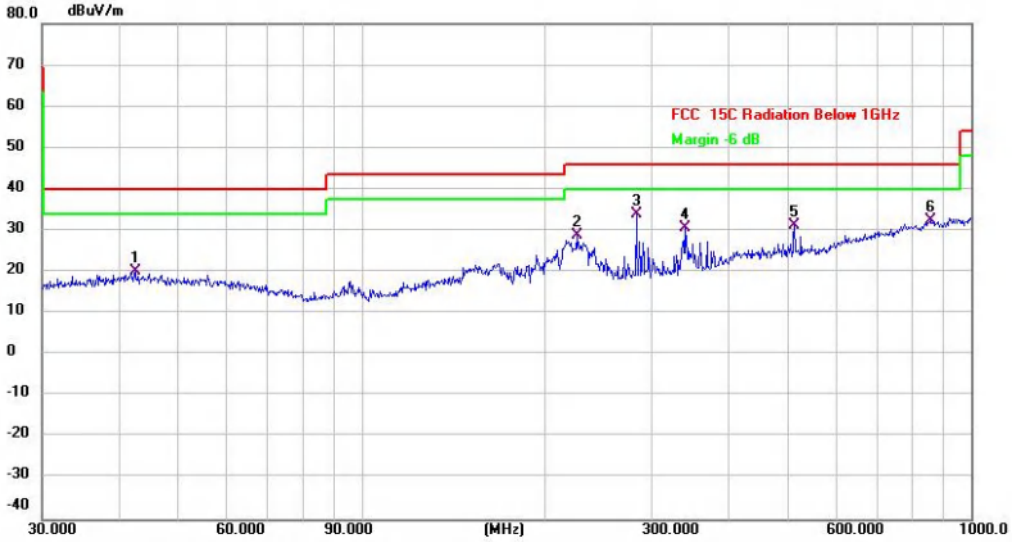
Note:
The amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.
All modes of operation of the EUT were investigated, and only the worst-case results are reported. There were no emissions found below 30MHz within 20dB of the limit.

### 6.9.2 Test Setup Diagram:



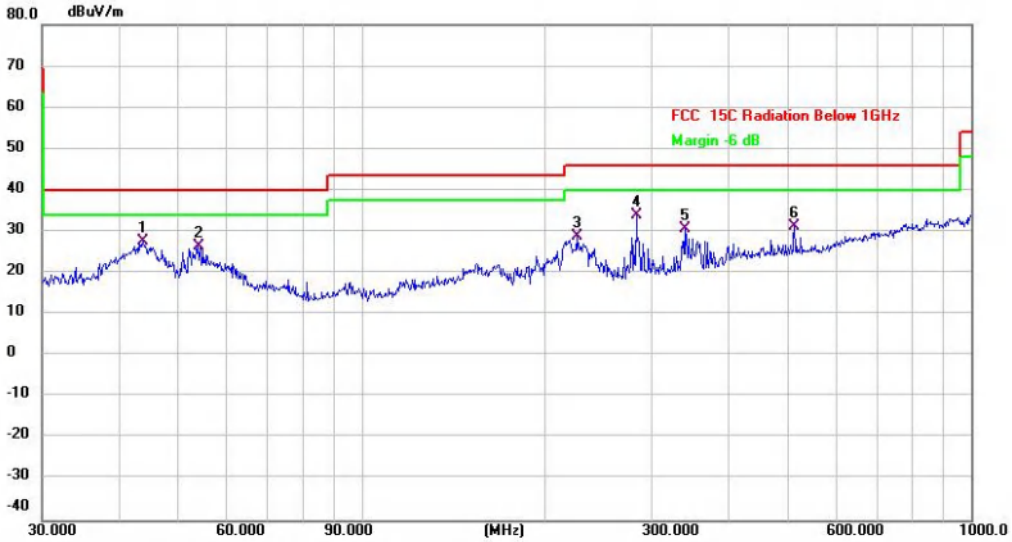
### 6.9.3 Test Data:

Mode3 / Polarization: Horizontal / CH: H




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 42.6000 | 28.66 | -8.41 | 20.25 | 40.00 | -19.75 | QP | |
| 2 | | 226.0994 | 39.17 | -10.32 | 28.85 | 46.00 | -17.15 | QP | |
| 3 | * | 282.9852 | 41.09 | -7.09 | 34.00 | 46.00 | -12.00 | QP | |
| 4 | | 339.5888 | 36.85 | -6.14 | 30.71 | 46.00 | -15.29 | QP | |
| 5 | | 513.6331 | 33.70 | -2.46 | 31.24 | 46.00 | -14.76 | QP | |
| 6 | | 857.0247 | 27.82 | 4.70 | 32.52 | 46.00 | -13.48 | QP | |

Mode3 / Polarization: Vertical / CH: H




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 43.8119 | 36.04 | -8.44 | 27.60 | 40.00 | -12.40 | QP | |
| 2 | | 53.8818 | 35.48 | -8.93 | 26.55 | 40.00 | -13.45 | QP | |
| 3 | | 226.0994 | 39.17 | -10.32 | 28.85 | 46.00 | -17.15 | QP | |
| 4 | * | 282.9852 | 41.09 | -7.09 | 34.00 | 46.00 | -12.00 | QP | |
| 5 | | 339.5888 | 36.85 | -6.14 | 30.71 | 46.00 | -15.29 | QP | |
| 6 | | 513.6331 | 33.70 | -2.46 | 31.24 | 46.00 | -14.76 | QP | |

## 6.10 Radiated emissions (above 1GHz)

| | |
|---|---|
| Test Requirement: | Refer to 47 CFR 15.247(d), 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)(see § 15.205(c)). |
| Test Limit: | |

| 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 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

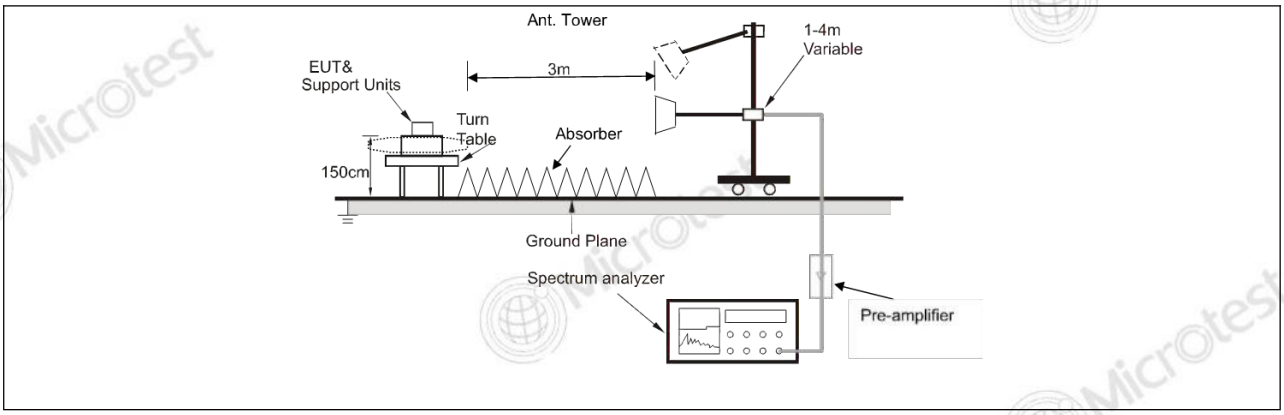
| | |
|---|---|
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.5.4<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |
| Procedure: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 section 6.5.4 |

### 6.10.1 E.U.T. Operation:

| Operating Environment: | | | | | |
|---|---|---|---|---|---|
| Temperature: | 23.4 °C | Humidity: | 45.1 % | Atmospheric Pressure: | 101 kPa |
| Pre test mode: | Mode1, Mode2, Mode3 | | | | |
| Final test mode: | All of the listed pre-test mode were tested, only the data of the worst mode (Mode3) is recorded in the report | | | | |

Note: Test frequency are from 1GHz to 25GHz, the amplitude of spurious emissions which are attenuated more than 20 dB below the limits are not reported.
All modes of operation of the EUT were investigated, and only the worst-case results are reported.

### 6.10.2 Test Setup Diagram:



### 6.10.3 Test Data:

Mode3 / Polarization: Horizontal / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4804.000 | 49.24 | 2.70 | 51.94 | 74.00 | -22.06 | peak |
| 2 | | 4804.000 | 44.55 | 2.70 | 47.25 | 54.00 | -6.75 | AVG |
| 3 | | 7206.000 | 43.46 | 7.46 | 50.92 | 74.00 | -23.08 | peak |
| 4 | * | 7206.000 | 40.14 | 7.46 | 47.60 | 54.00 | -6.40 | AVG |
| 5 | | 9608.000 | 43.04 | 8.79 | 51.83 | 74.00 | -22.17 | peak |
| 6 | | 9608.000 | 38.32 | 8.79 | 47.11 | 54.00 | -6.89 | AVG |

Mode3 / Polarization: Vertical / CH: L

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4804.000 | 42.84 | 2.70 | 45.54 | 74.00 | -28.46 | peak |
| 2 | | 4804.000 | 41.45 | 2.70 | 44.15 | 54.00 | -9.85 | AVG |
| 3 | | 7206.000 | 43.36 | 7.46 | 50.82 | 74.00 | -23.18 | peak |
| 4 | * | 7206.000 | 39.78 | 7.46 | 47.24 | 54.00 | -6.76 | AVG |
| 5 | | 9608.000 | 43.10 | 8.79 | 51.89 | 74.00 | -22.11 | peak |
| 6 | | 9608.000 | 38.37 | 8.79 | 47.16 | 54.00 | -6.84 | AVG |

Mode3 / Polarization: Horizontal / CH: M

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4882.000 | 54.68 | 2.74 | 57.42 | 74.00 | -16.58 | peak |
| 2 | | 4882.000 | 48.46 | 2.74 | 51.20 | 54.00 | -2.80 | AVG |
| 3 | | 7323.000 | 42.49 | 7.81 | 50.30 | 74.00 | -23.70 | peak |
| 4 | | 7323.000 | 38.56 | 7.81 | 46.37 | 54.00 | -7.63 | AVG |
| 5 | | 9764.000 | 46.59 | 9.88 | 56.47 | 74.00 | -17.53 | peak |
| 6 | * | 9764.000 | 43.02 | 9.88 | 52.90 | 54.00 | -1.10 | AVG |

Mode3 / Polarization: Vertical / CH: M

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4882.000 | 45.60 | 2.74 | 48.34 | 74.00 | -25.66 | peak |
| 2 | | 4882.000 | 43.28 | 2.74 | 46.02 | 54.00 | -7.98 | AVG |
| 3 | | 7323.000 | 43.39 | 7.81 | 51.20 | 74.00 | -22.80 | peak |
| 4 | * | 7323.000 | 39.52 | 7.81 | 47.33 | 54.00 | -6.67 | AVG |
| 5 | | 9764.000 | 45.09 | 9.88 | 54.97 | 74.00 | -19.03 | peak |
| 6 | | 9764.000 | 37.27 | 9.88 | 47.15 | 54.00 | -6.85 | AVG |

Mode3 / Polarization: Horizontal / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4960.000 | 51.88 | 3.10 | 54.98 | 74.00 | -19.02 | peak |
| 2 | * | 4960.000 | 47.78 | 3.10 | 50.88 | 54.00 | -3.12 | AVG |
| 3 | | 7440.000 | 42.50 | 7.65 | 50.15 | 74.00 | -23.85 | peak |
| 4 | | 7440.000 | 37.63 | 7.65 | 45.28 | 54.00 | -8.72 | AVG |
| 5 | | 9920.000 | 45.07 | 9.23 | 54.30 | 74.00 | -19.70 | peak |
| 6 | | 9920.000 | 40.11 | 9.23 | 49.34 | 54.00 | -4.66 | AVG |

Mode3 / Polarization: Vertical / CH: H

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4960.000 | 49.21 | 3.10 | 52.31 | 74.00 | -21.69 | peak |
| 2 | * | 4960.000 | 46.14 | 3.10 | 49.24 | 54.00 | -4.76 | AVG |
| 3 | | 7440.000 | 43.09 | 7.65 | 50.74 | 74.00 | -23.26 | peak |
| 4 | | 7440.000 | 38.59 | 7.65 | 46.24 | 54.00 | -7.76 | AVG |
| 5 | | 9920.000 | 44.43 | 9.23 | 53.66 | 74.00 | -20.34 | peak |
| 6 | | 9920.000 | 39.01 | 9.23 | 48.24 | 54.00 | -5.76 | AVG |

## Photographs of the test setup

Refer to Appendix - Test Setup Photos

## Photographs of the EUT

Refer to Appendix - EUT Photos

# Appendix

## Appendix A: 20dB Emission Bandwidth

Test Result

| Test Mode | Antenna | Frequency [MHz] | 20db EBW [MHz] |
|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.954 |
| | | 2441 | 0.945 |
| | | 2480 | 0.954 |
| 2DH5 | Ant1 | 2402 | 1.338 |
| | | 2441 | 1.329 |
| | | 2480 | 1.332 |
| 3DH5 | Ant1 | 2402 | 1.317 |
| | | 2441 | 1.314 |
| | | 2480 | 1.311 |

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

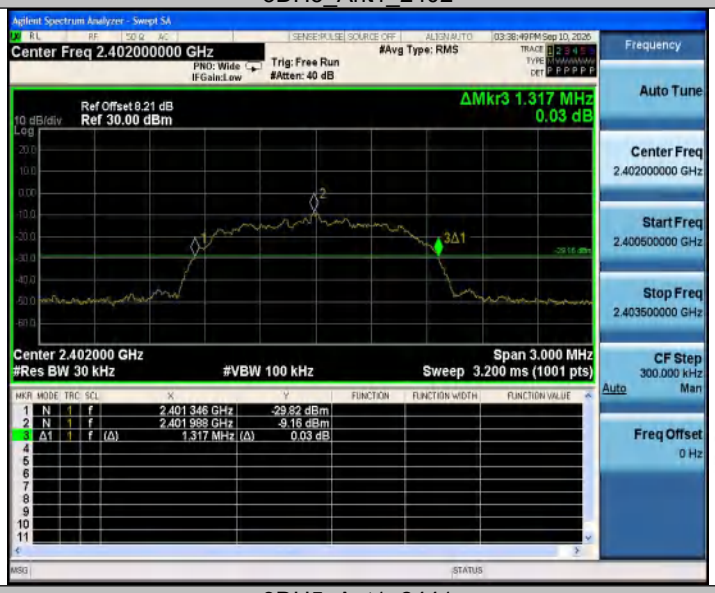
DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402




3DH5_Ant1_2441

3DH5_Ant1_2480

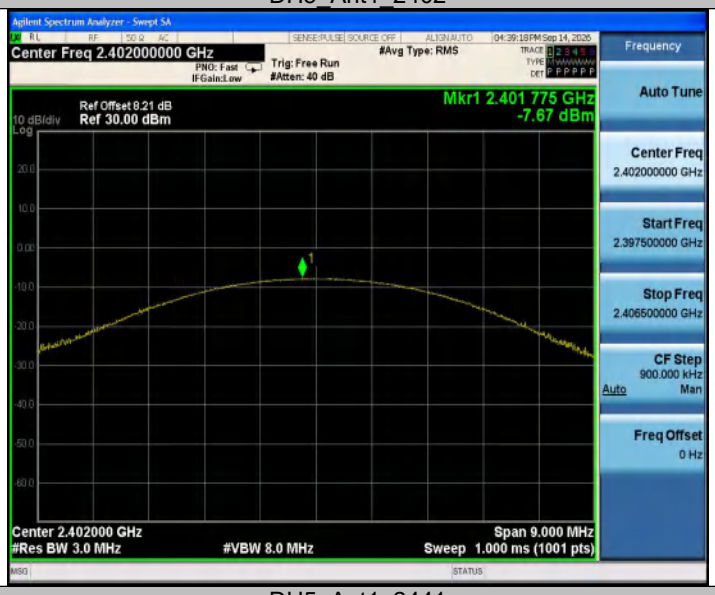
## Appendix B: Maximum conducted output power

Test Result Peak

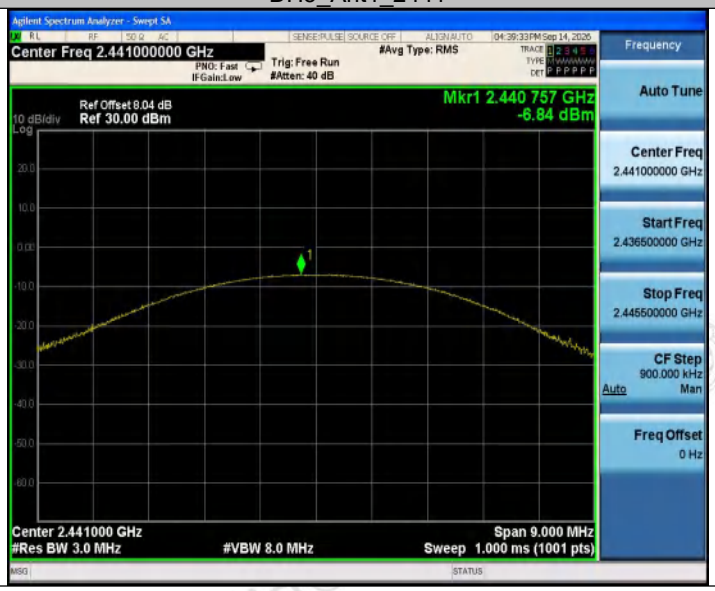
| Test Mode | Antenna | Frequency [MHz] | Conducted Peak Power [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | -7.67 | ≤30 | PASS |
| | | 2441 | -6.84 | ≤30 | PASS |
| | | 2480 | -5.95 | ≤30 | PASS |
| 2DH5 | Ant1 | 2402 | -5.94 | ≤20.97 | PASS |
| | | 2441 | -5.09 | ≤20.97 | PASS |
| | | 2480 | -4.08 | ≤20.97 | PASS |
| 3DH5 | Ant1 | 2402 | -5.55 | ≤20.97 | PASS |
| | | 2441 | -4.64 | ≤20.97 | PASS |
| | | 2480 | -3.76 | ≤20.97 | PASS |

Test Graphs

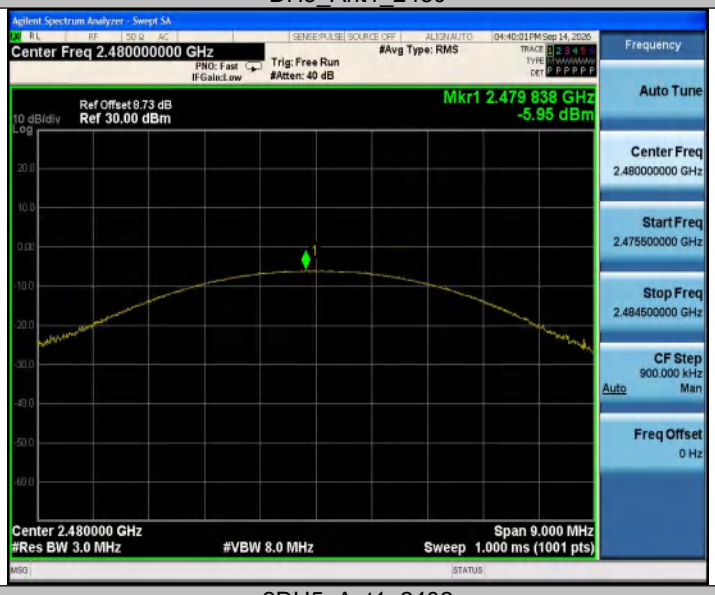
DH5_Ant1_2402




DH5_Ant1_2441

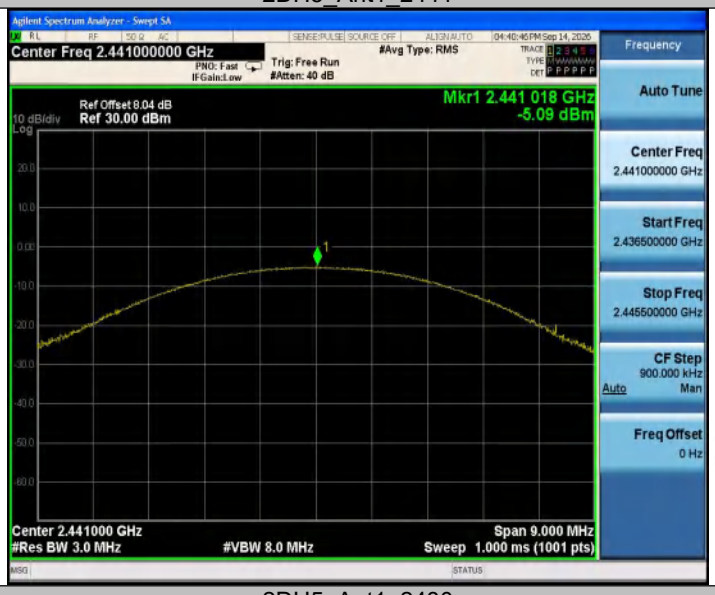


DH5_Ant1_2480




2DH5_Ant1_2402

2DH5_Ant1_2441




2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

## Appendix C: Carrier frequency separation

Test Result

| Test Mode | Antenna | Frequency [MHz] | Result [MHz] | Limit [MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 0.998 | ≥0.636 | PASS |
| 2DH5 | Ant1 | Hop | 1.002 | ≥0.892 | PASS |
| 3DH5 | Ant1 | Hop | 1.002 | ≥0.878 | PASS |

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

## Appendix D: Time of occupancy

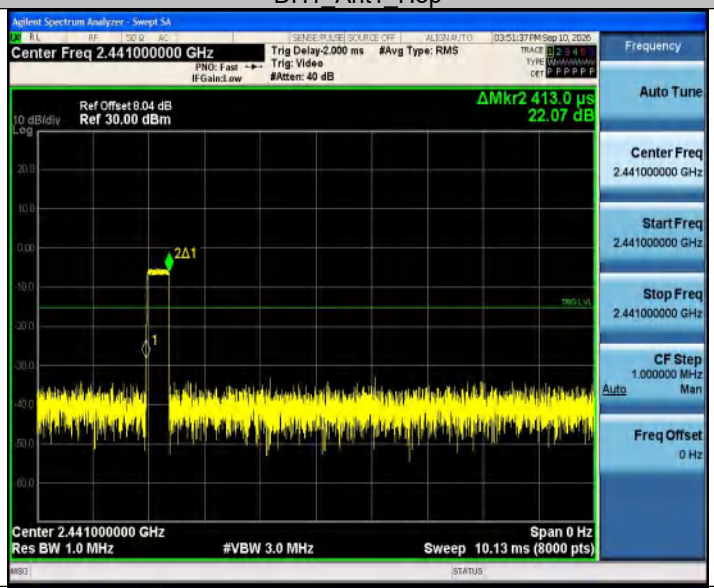
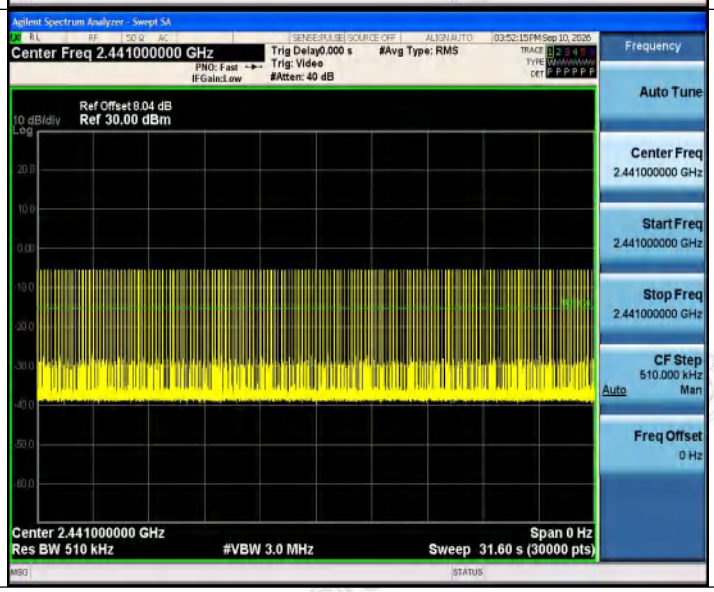
Test Result

| Test Mode | Antenna | Frequency [MHz] | BurstWidth [ms] | Hops in 31.6s [Num] | Result [s] | Limit [s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 0.413 | 317 | 0.131 | ≤0.4 | PASS |
| DH3 | Ant1 | Hop | 1.668 | 159 | 0.265 | ≤0.4 | PASS |
| DH5 | Ant1 | Hop | 2.916 | 113 | 0.33 | ≤0.4 | PASS |
| 2DH1 | Ant1 | Hop | 0.421 | 320 | 0.135 | ≤0.4 | PASS |
| 2DH3 | Ant1 | Hop | 1.672 | 165 | 0.276 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.922 | 103 | 0.301 | ≤0.4 | PASS |
| 3DH1 | Ant1 | Hop | 0.422 | 314 | 0.133 | ≤0.4 | PASS |
| 3DH3 | Ant1 | Hop | 1.672 | 157 | 0.263 | ≤0.4 | PASS |
| 3DH5 | Ant1 | Hop | 2.922 | 98 | 0.286 | ≤0.4 | PASS |

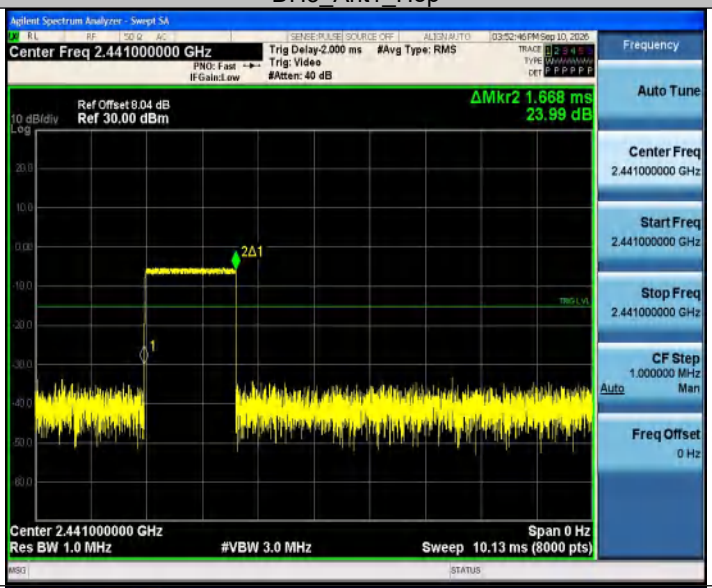
**Notes:**

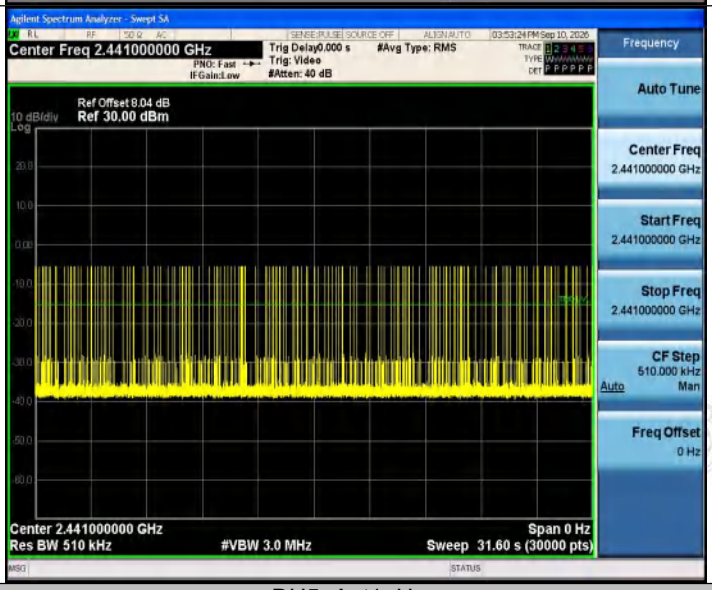
1. Period time = 0.4s * 79 = 31.6s
2. Result (Time of occupancy) = BurstWidth[ms] * Hops in 31.6s [Num]

Test Graphs

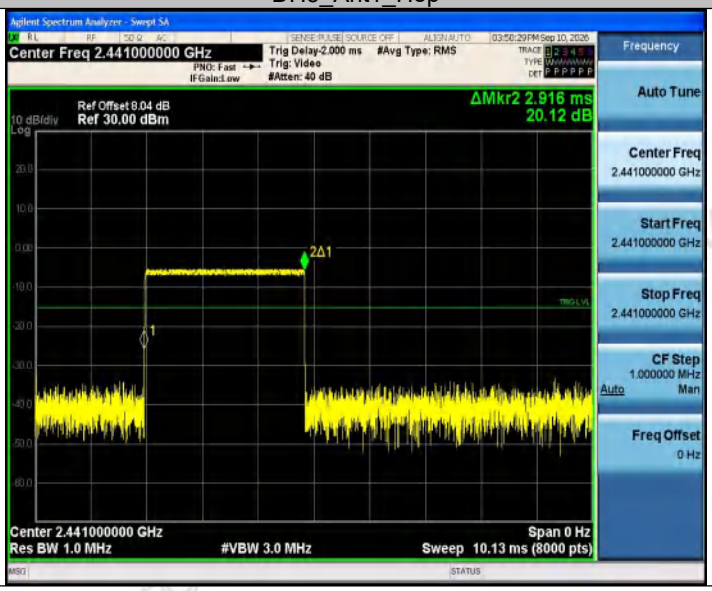
| DH1_Ant1_Hop | | |
|---|---|---|
| |   | |
| |   | |

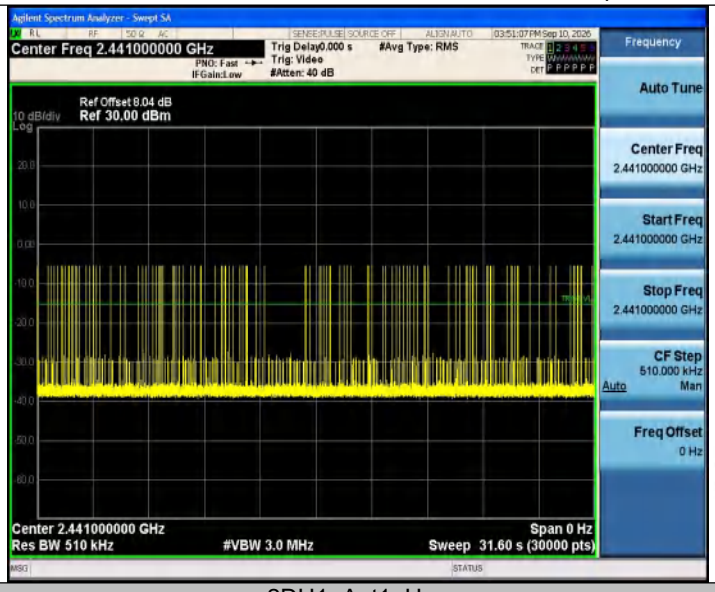
DH3_Ant1_Hop



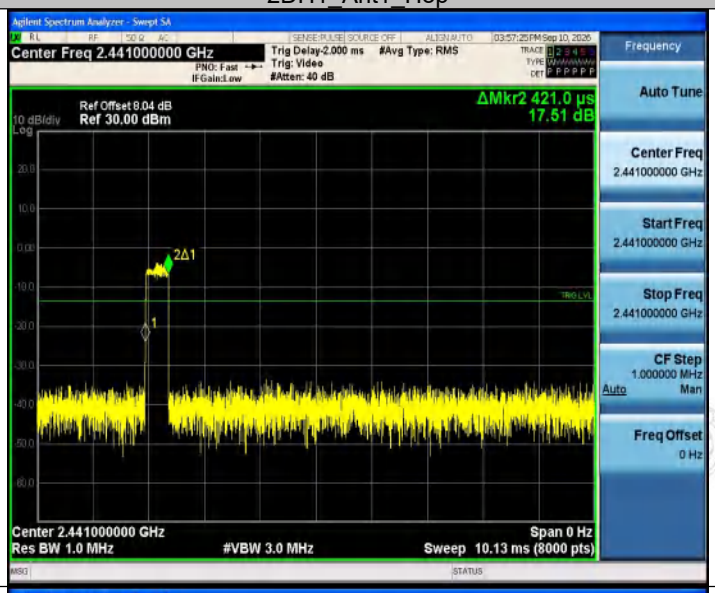



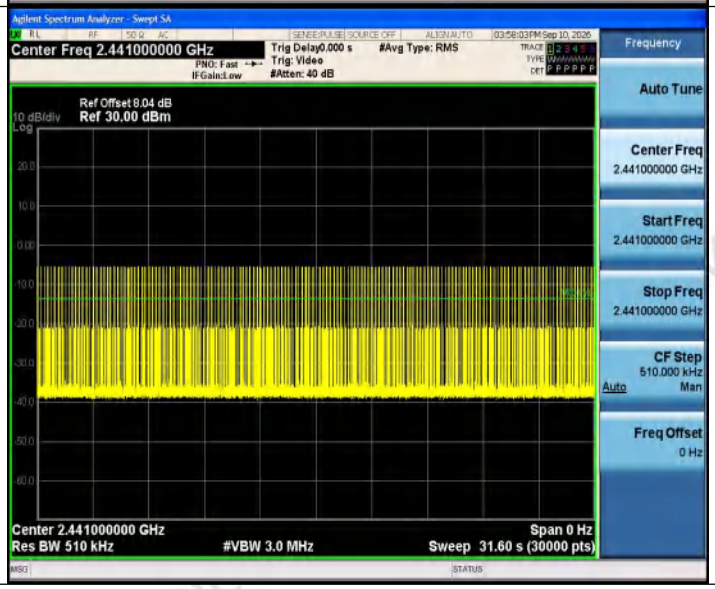

DH5_Ant1_Hop



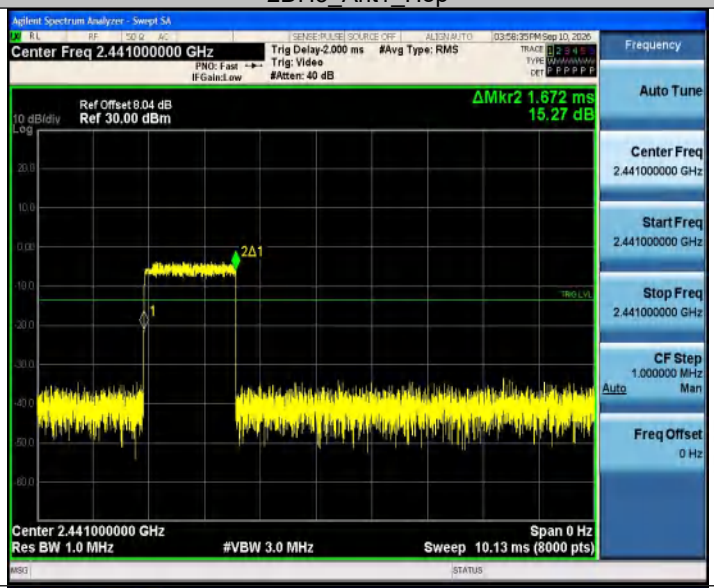


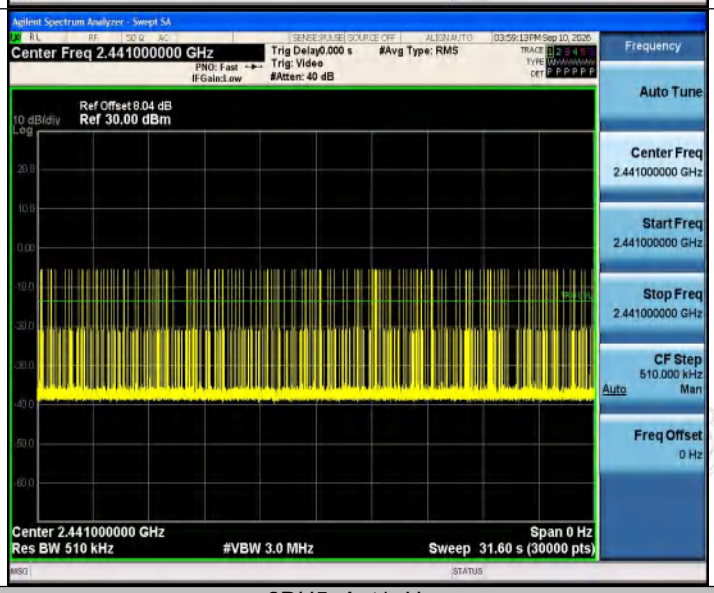

2DH1_Ant1_Hop



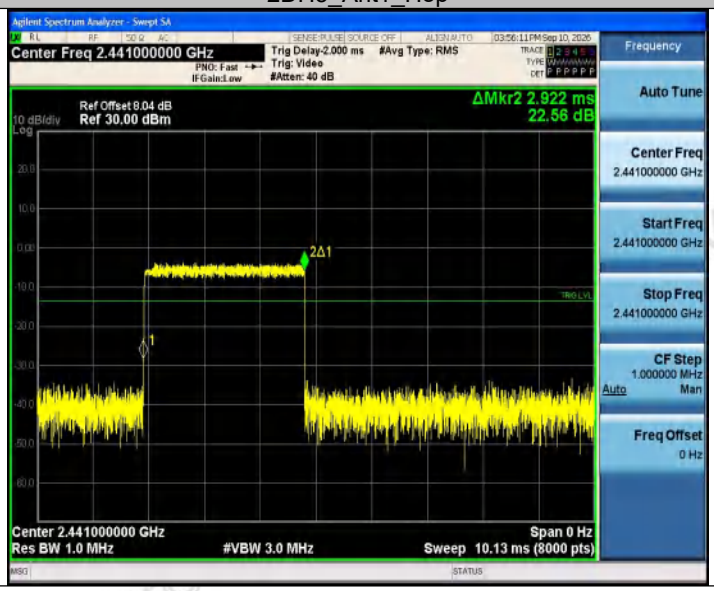



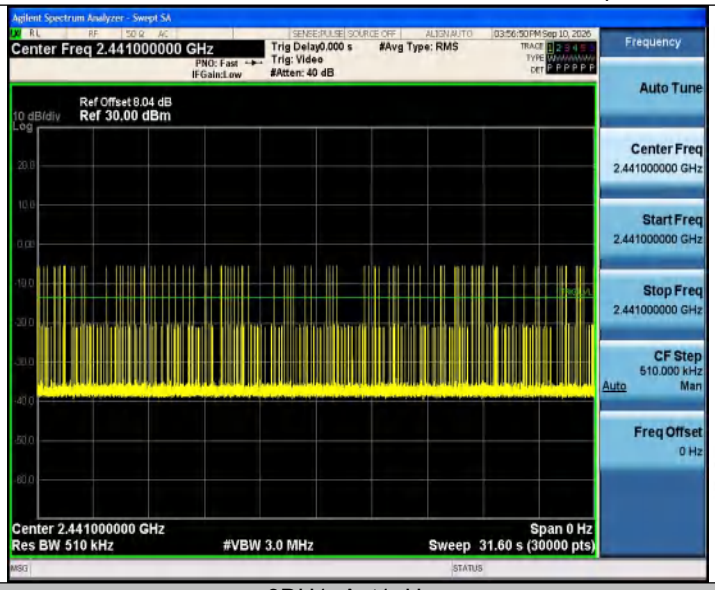
2DH3_Ant1_Hop



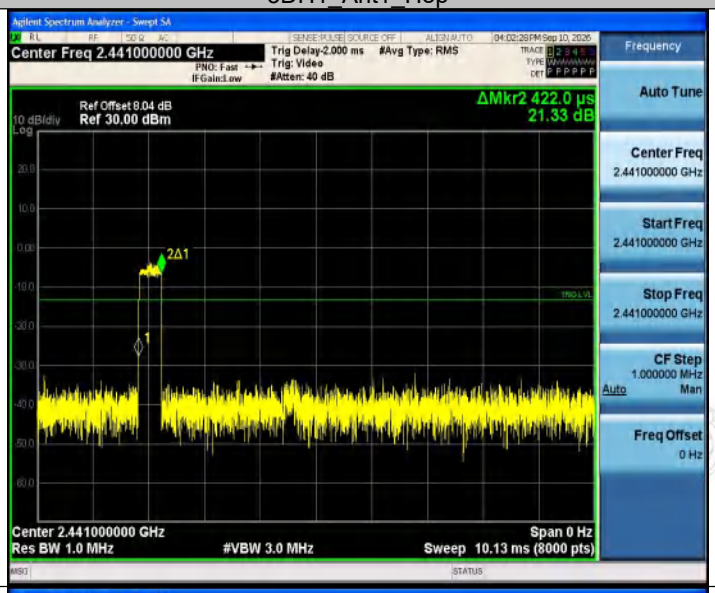



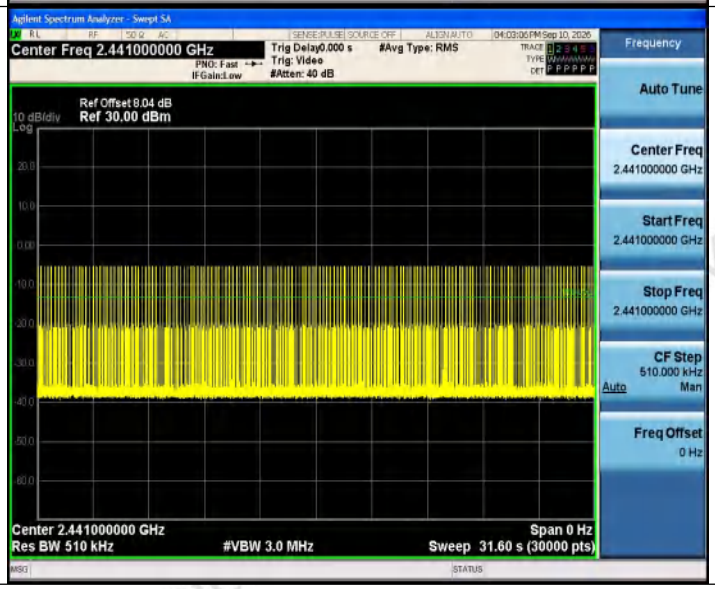

2DH5_Ant1_Hop



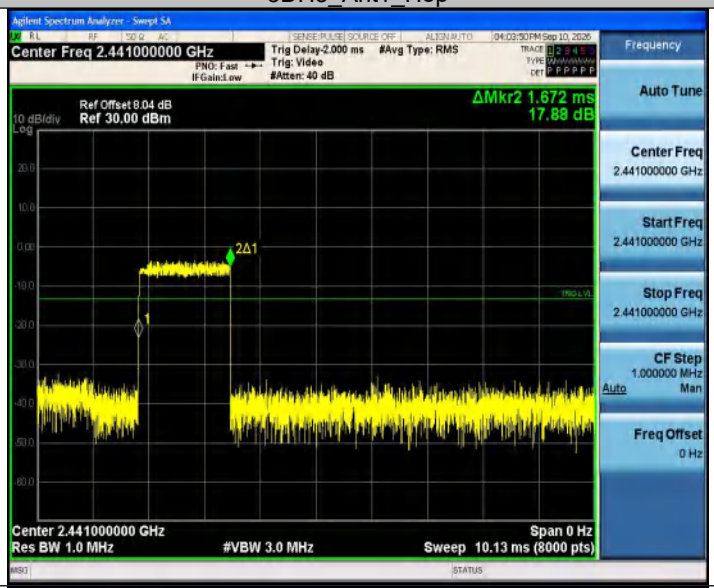


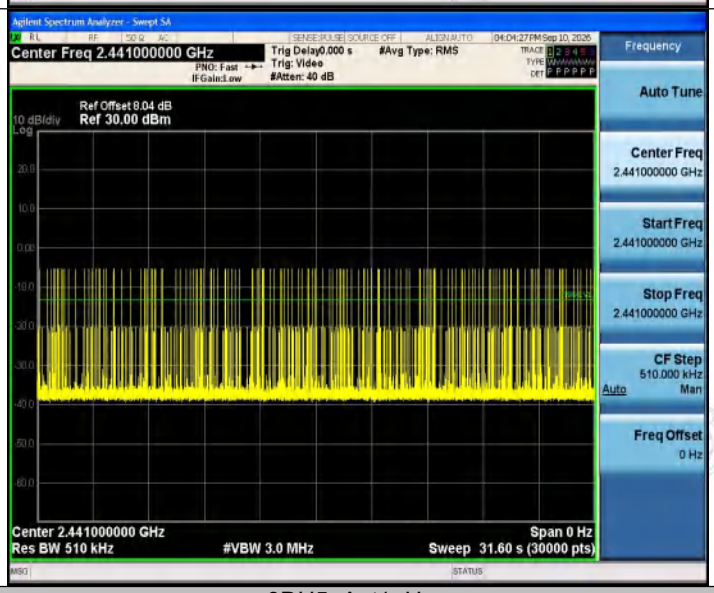

3DH1_Ant1_Hop



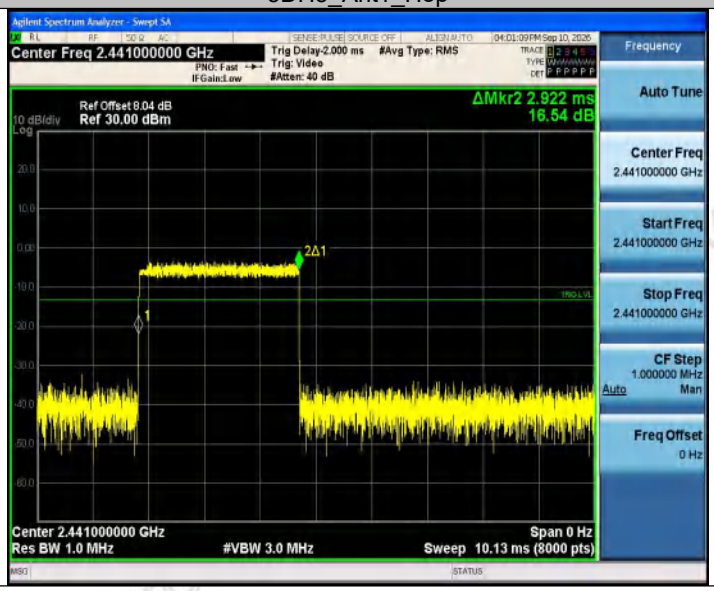



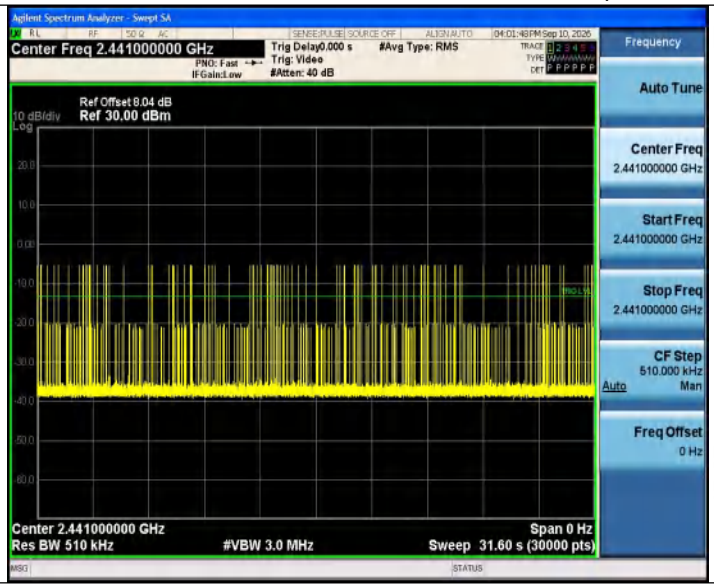
3DH3_Ant1_Hop




3DH5_Ant1_Hop




Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
Ref Offset 8.04 dB
10 dB/div
Ref 30.00 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

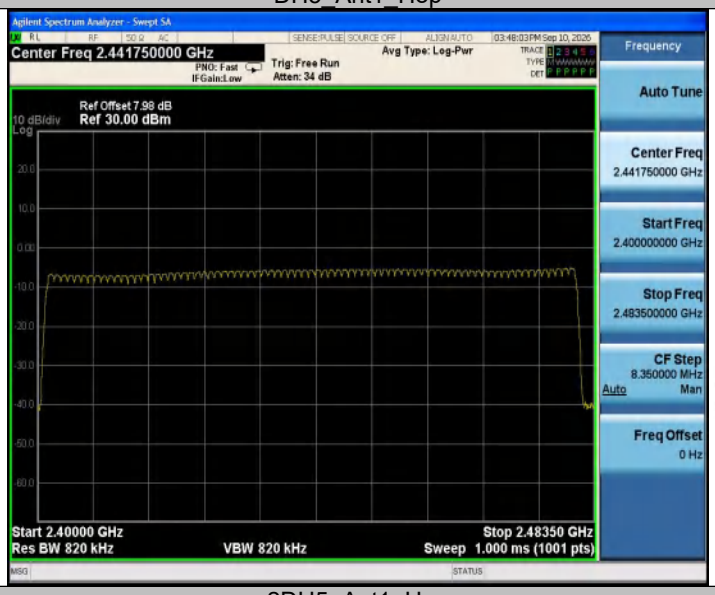
## Appendix E: Number of hopping channels

Test Result

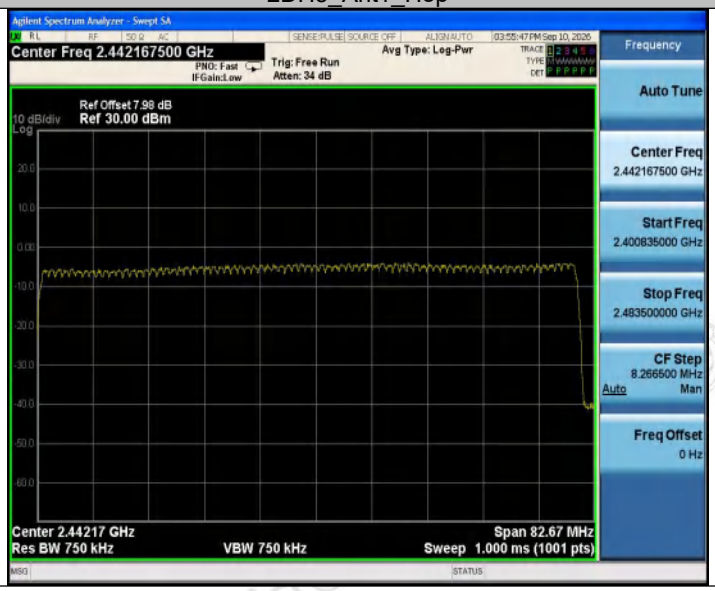
| Test Mode | Antenna | Frequency [MHz] | Result [Num] | Limit [Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

Test Graphs

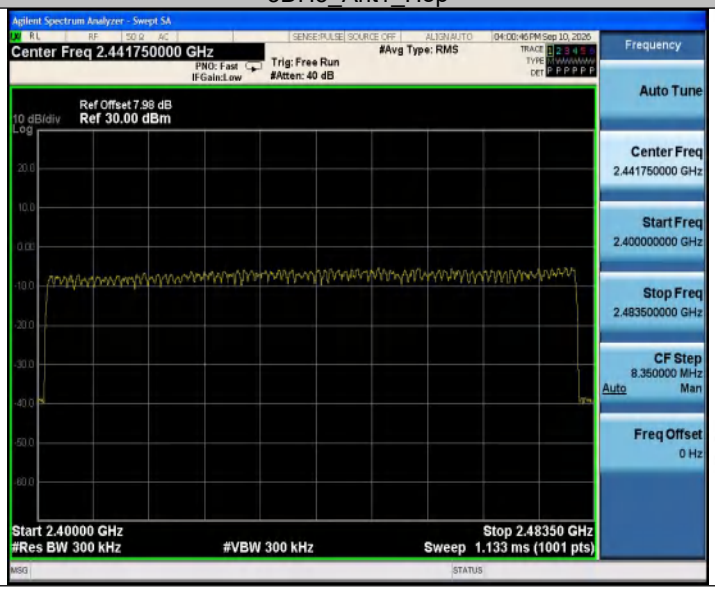
DH5_Ant1_Hop




2DH5_Ant1_Hop



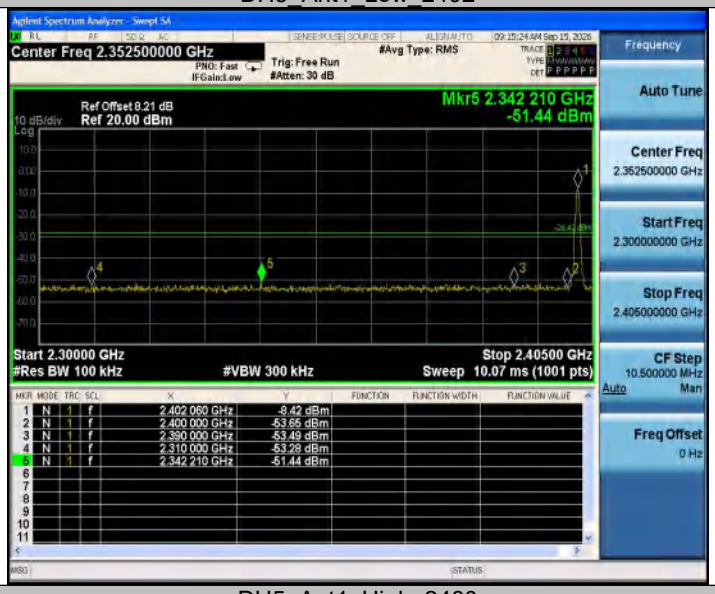
3DH5_Ant1_Hop



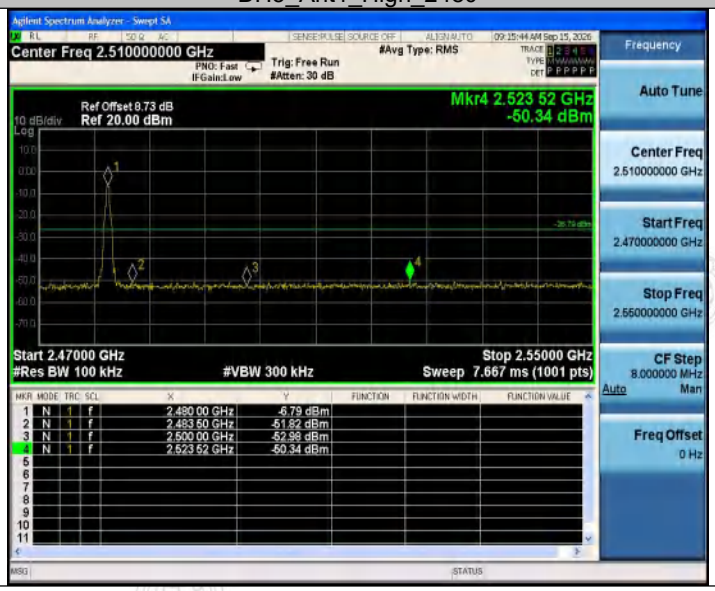
## Appendix F: Band edge measurements

Test Graphs

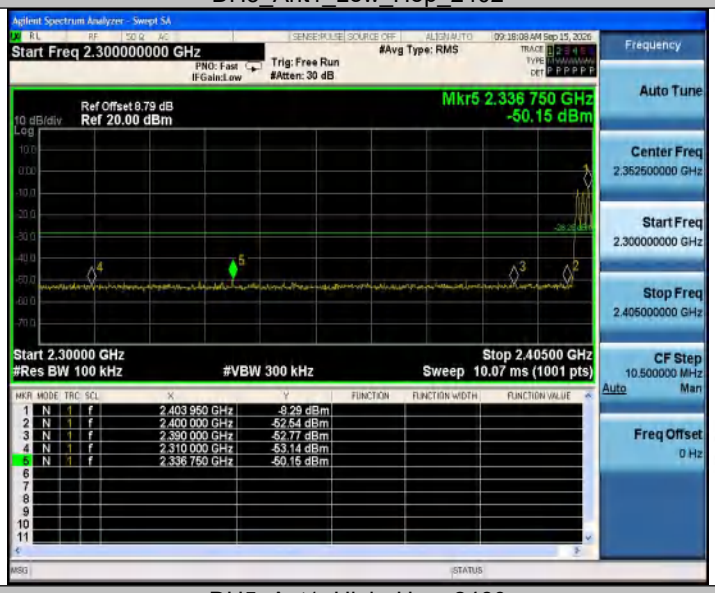
DH5_Ant1_Low_2402



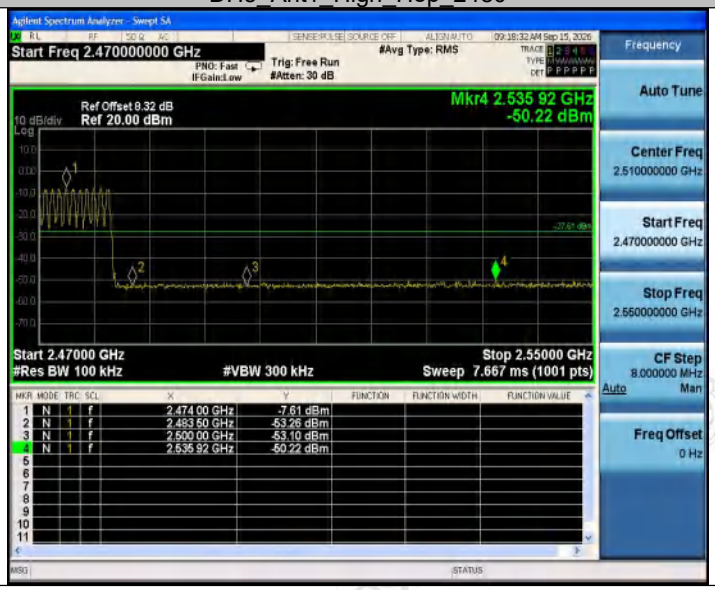

DH5_Ant1_High_2480



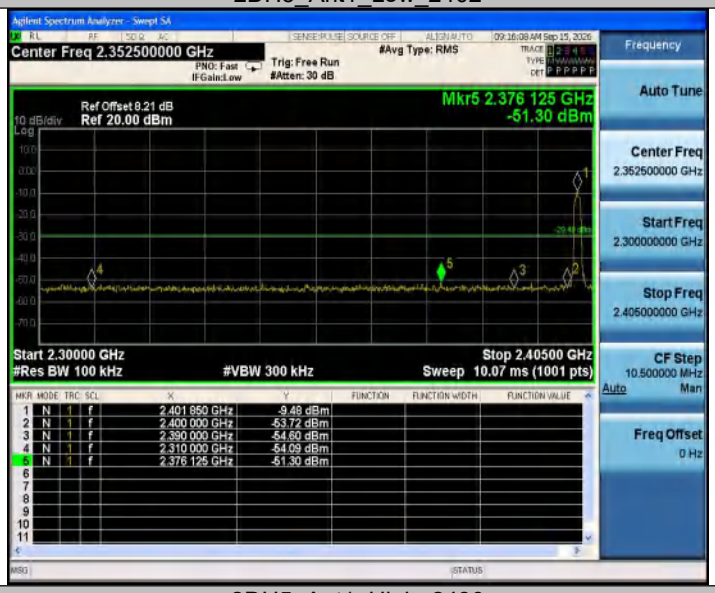
DH5_Ant1_Low_Hop_2402



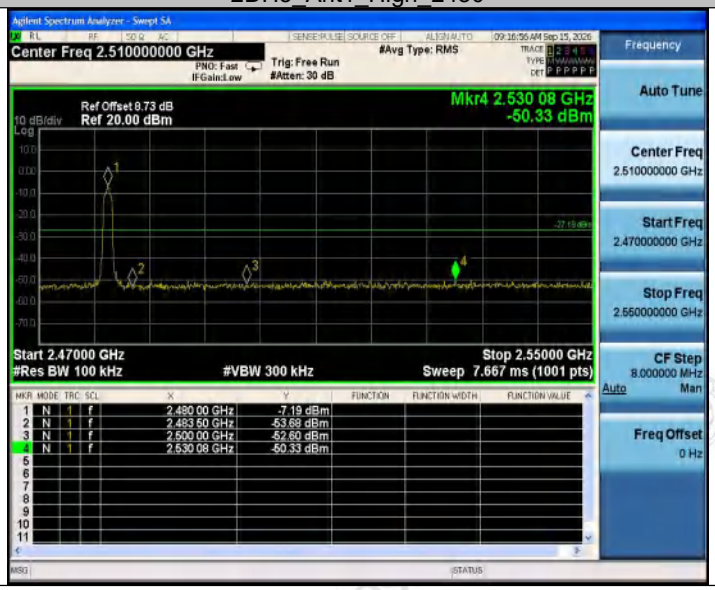

DH5_Ant1_High_Hop_2480



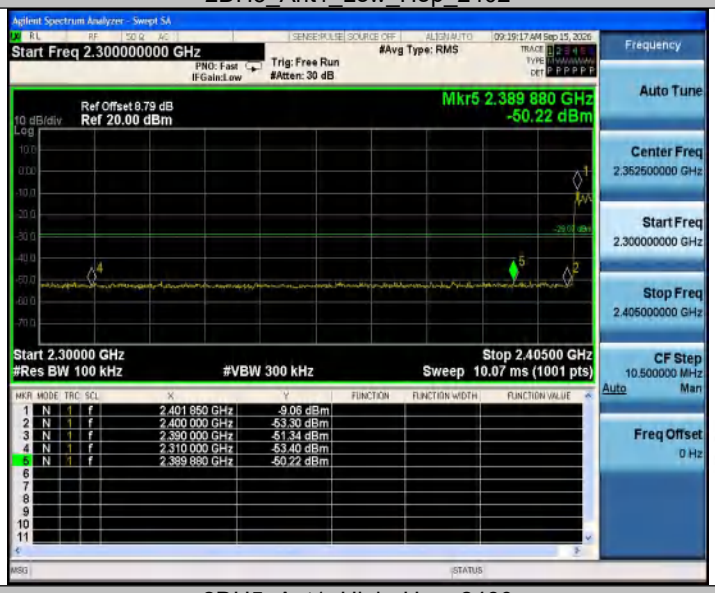
2DH5_Ant1_Low_2402



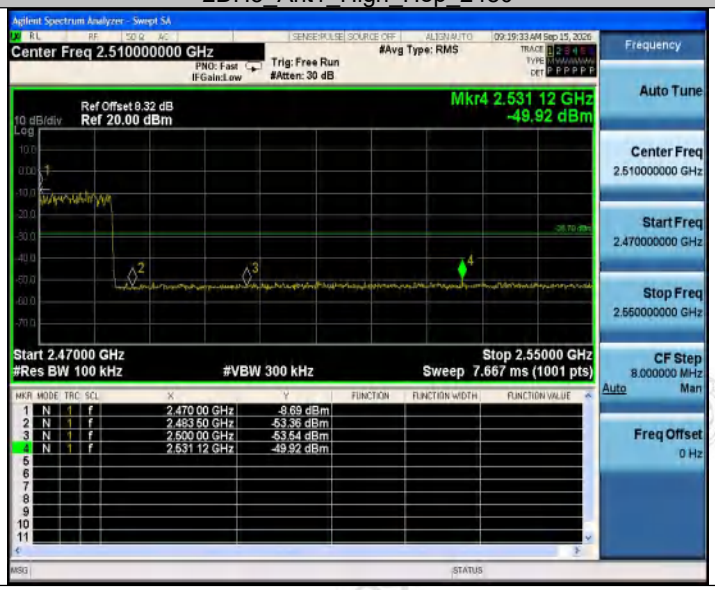

2DH5_Ant1_High_2480



2DH5_Ant1_Low_Hop_2402




2DH5_Ant1_High_Hop_2480



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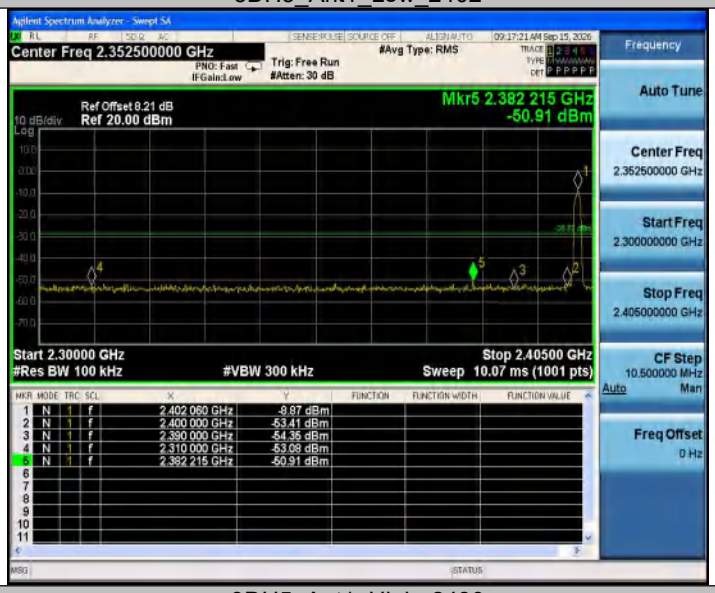


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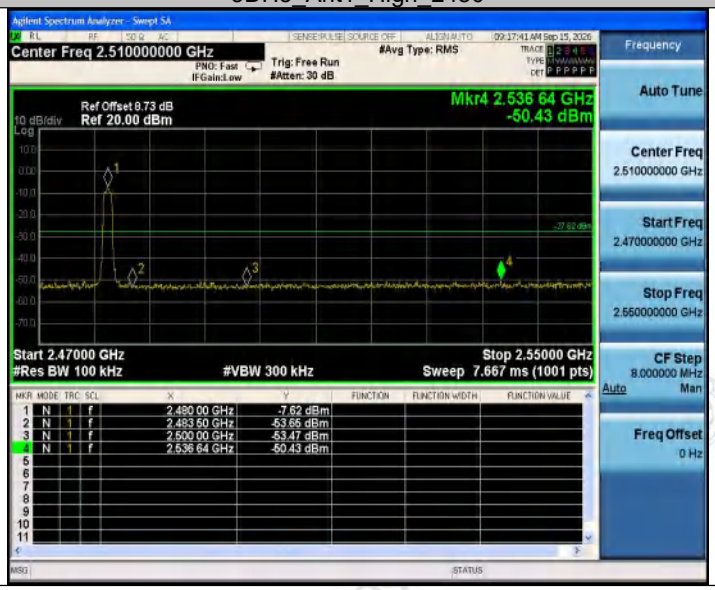

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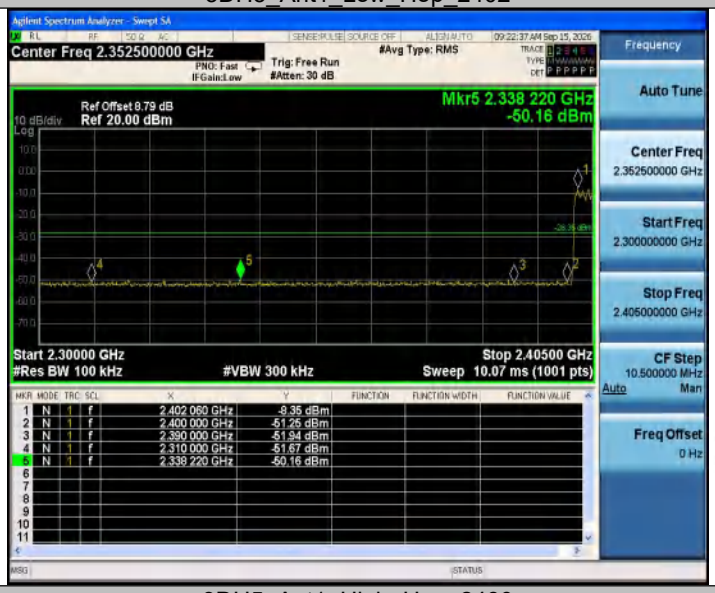


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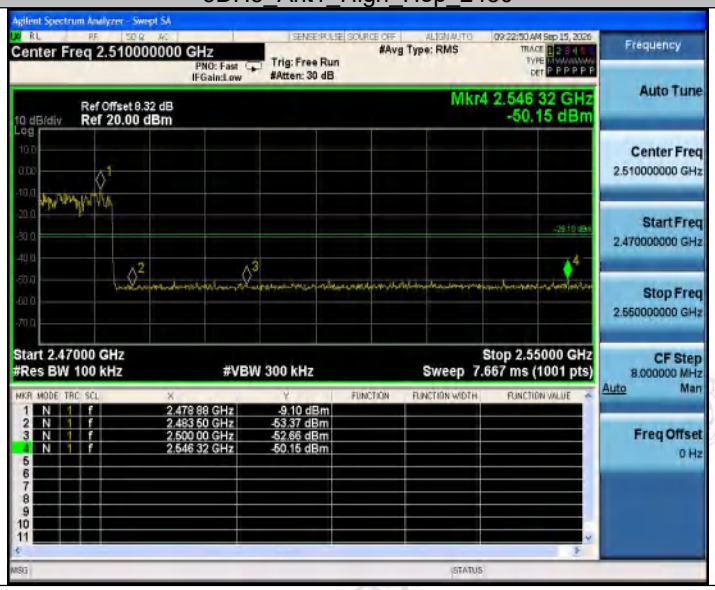
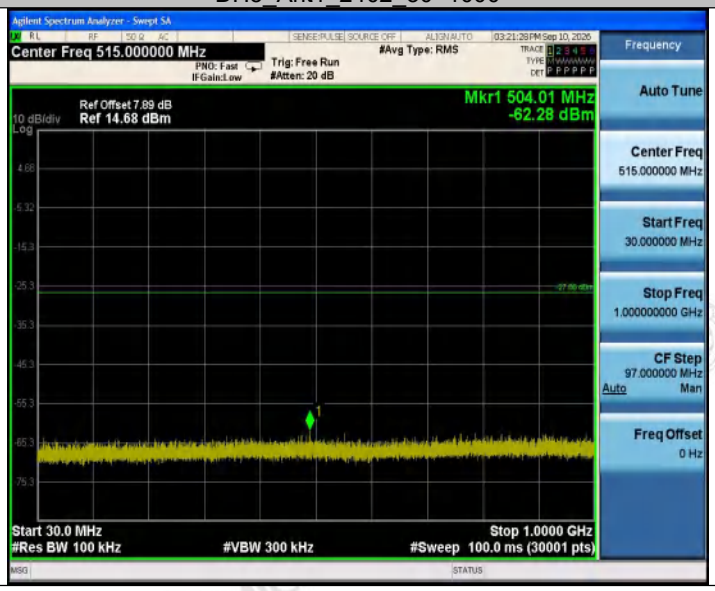


## Appendix G: Conducted Spurious Emission

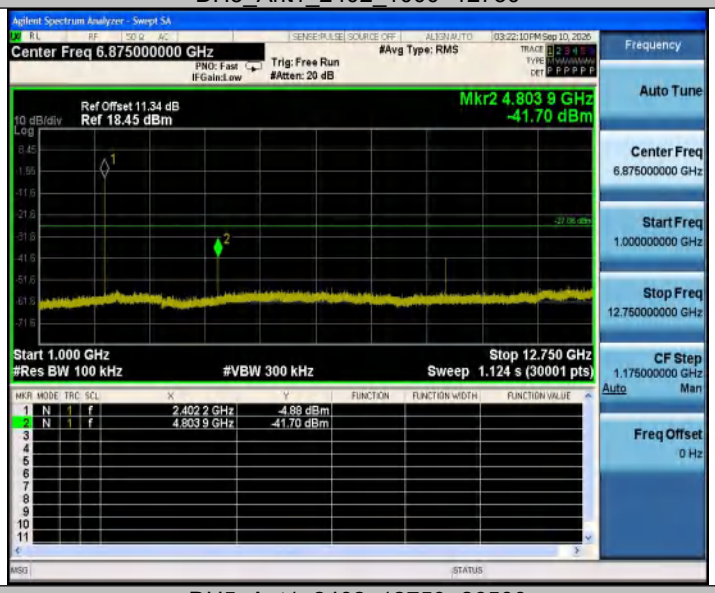
Test Graphs

DH5_Ant1_2402_0~Reference

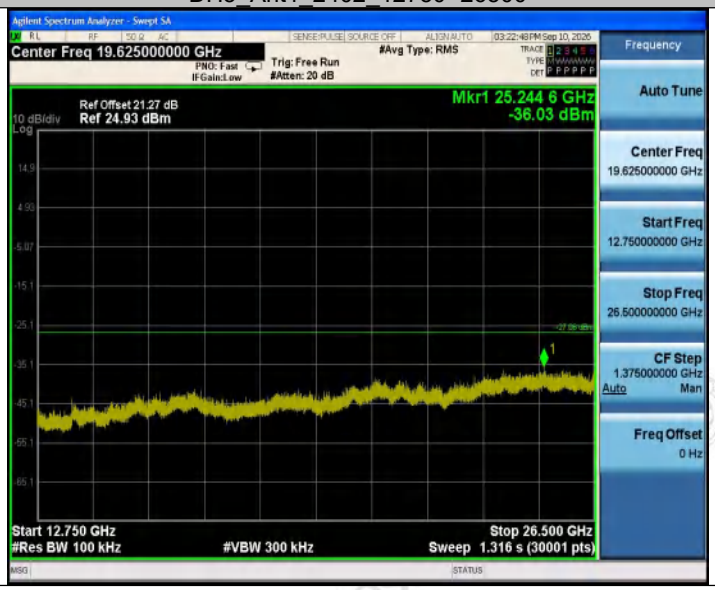
DH5_Ant1_2402_30~1000



DH5_Ant1_2402_1000~12750




DH5_Ant1_2402_12750~26500



DH5_Ant1_2441_0~Reference

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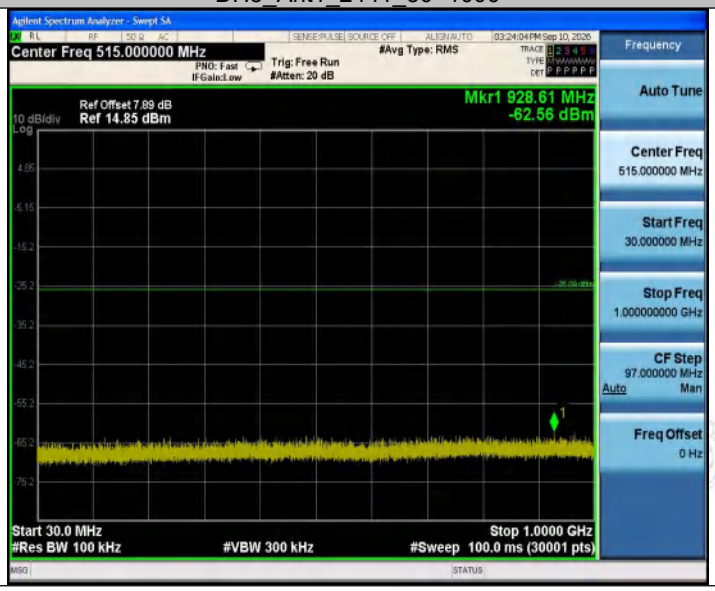

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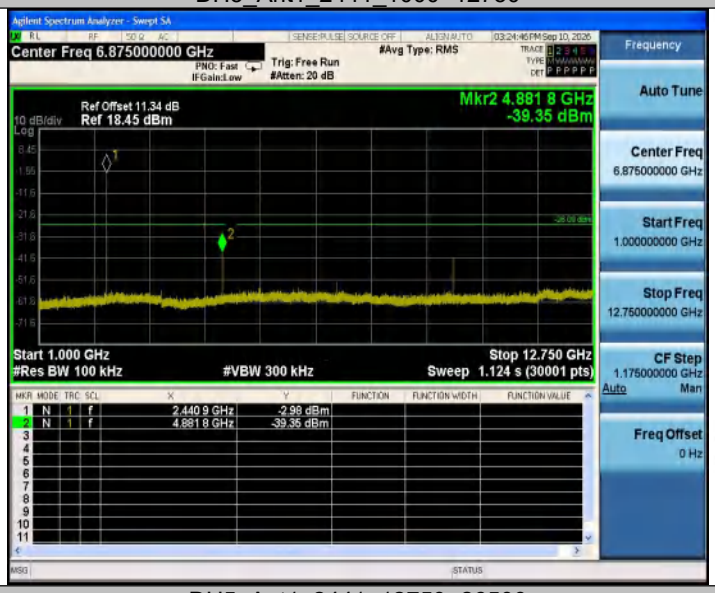


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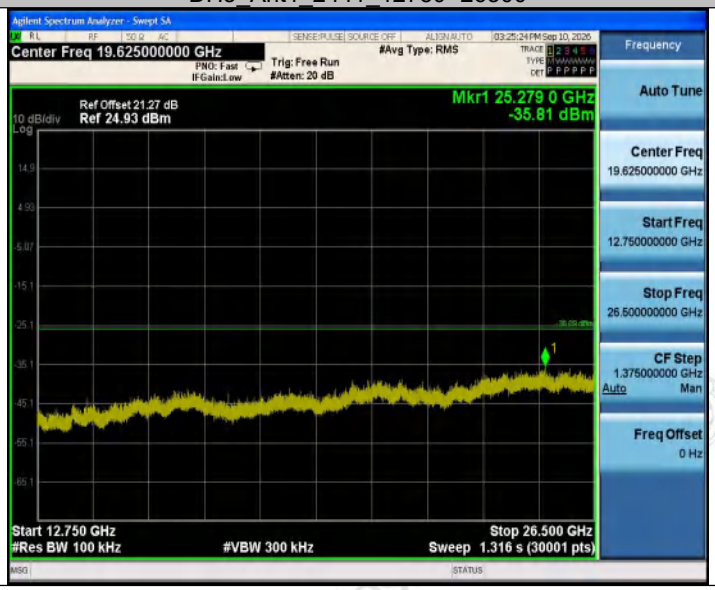

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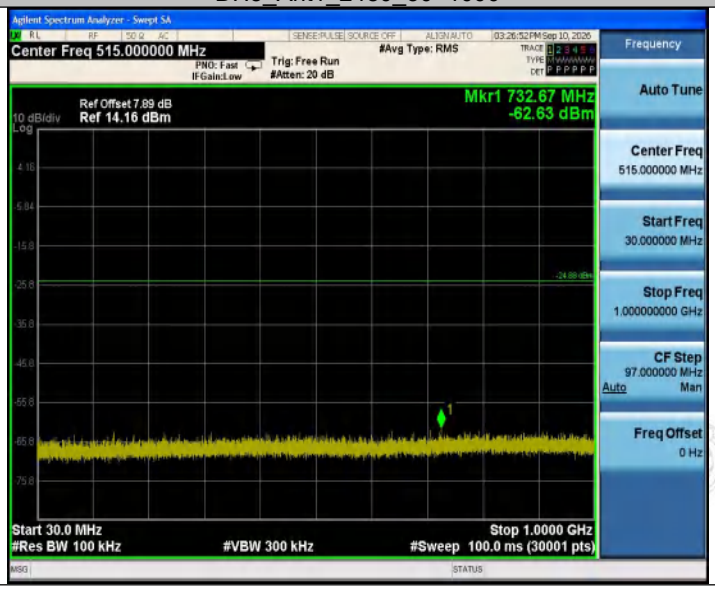

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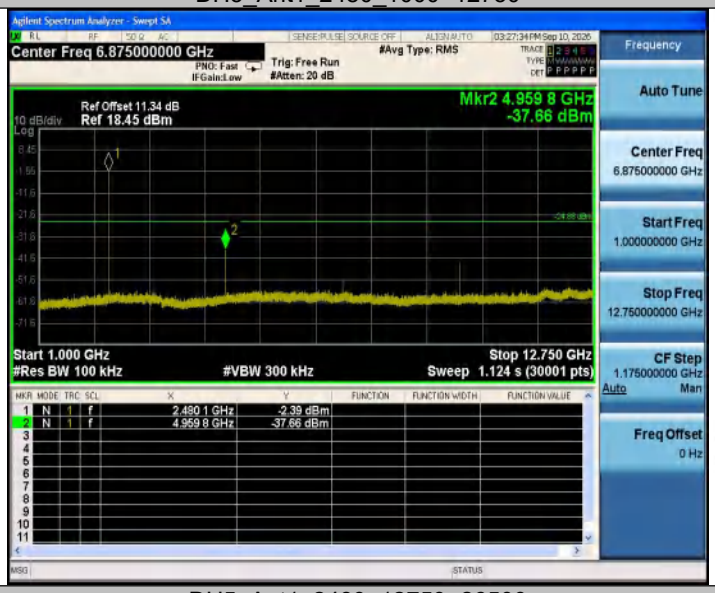


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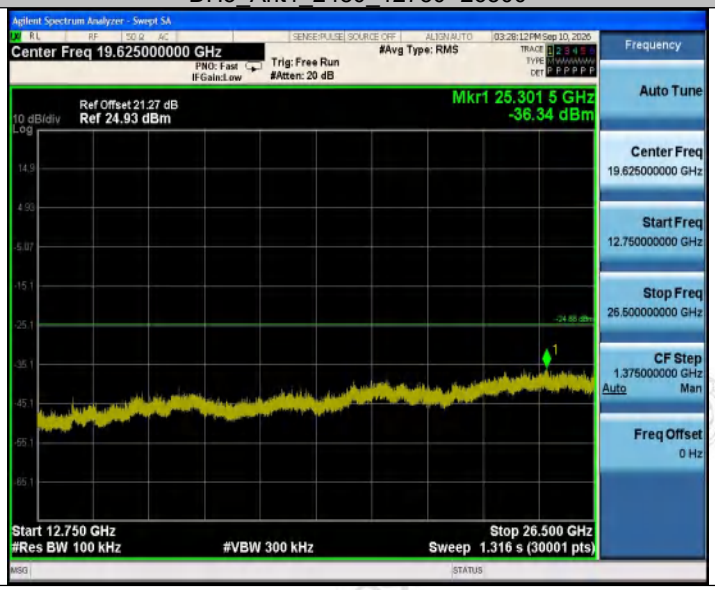

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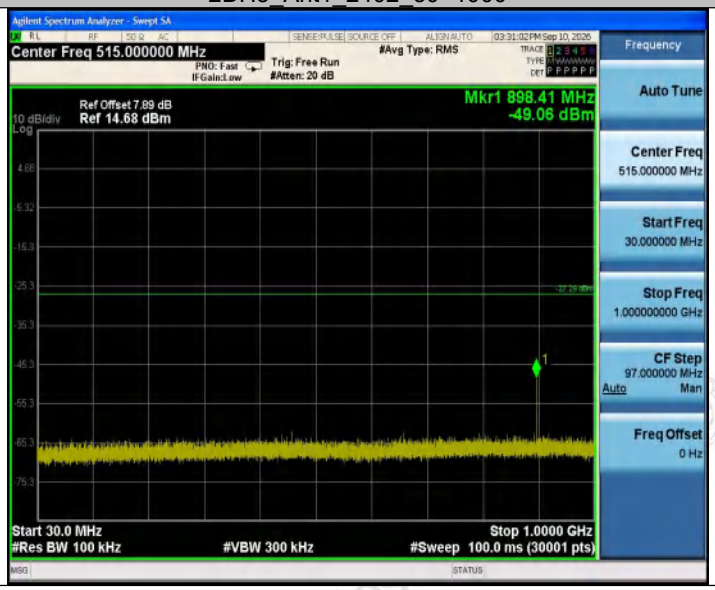

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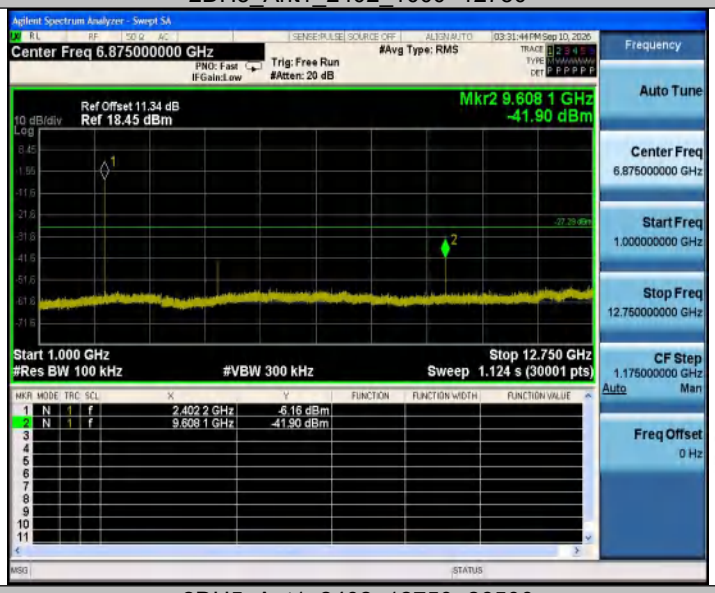


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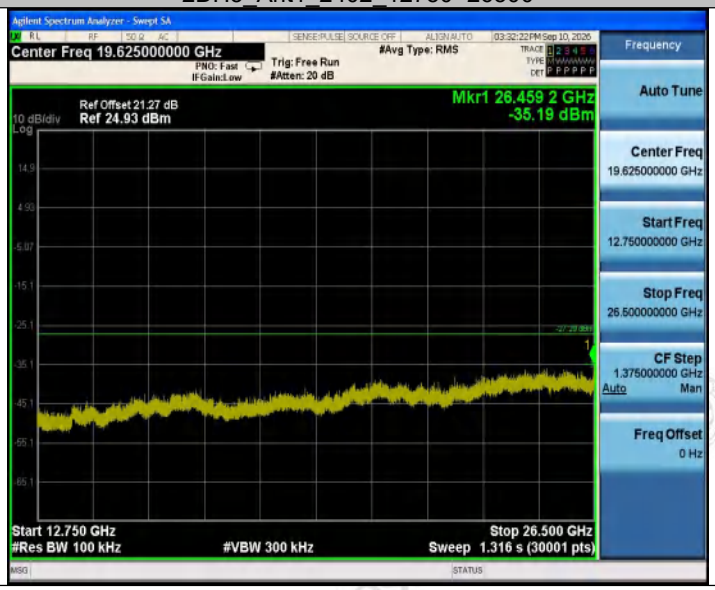

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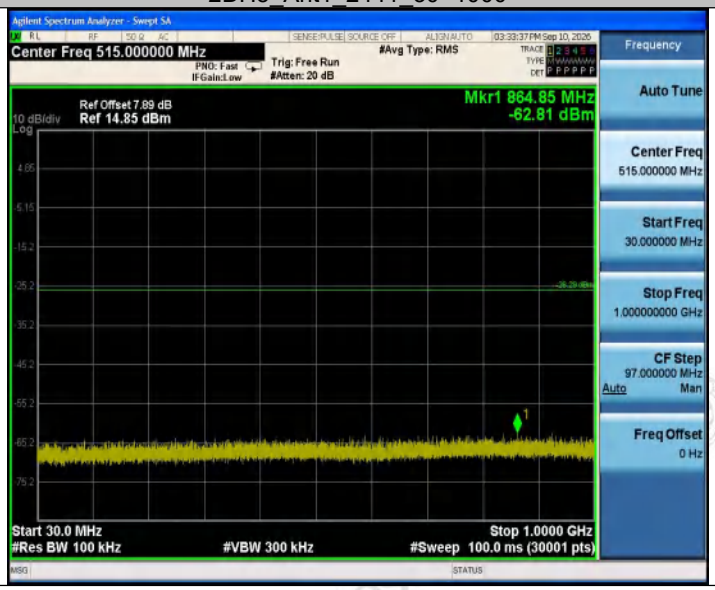

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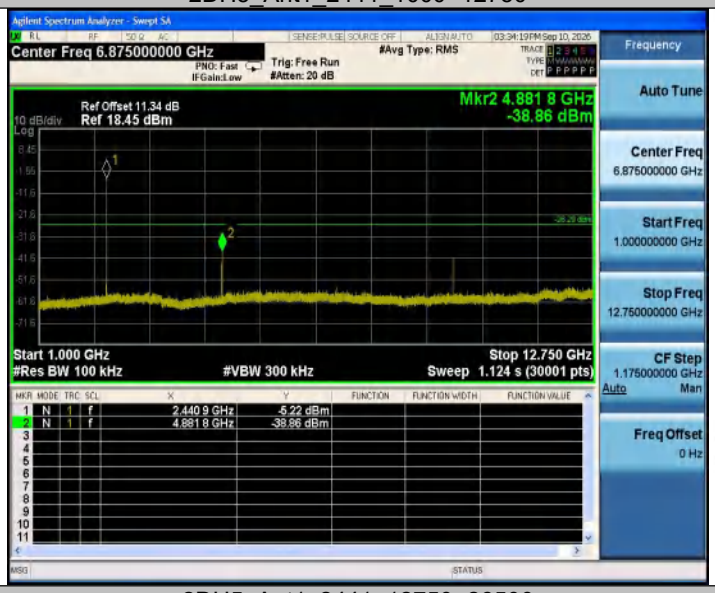


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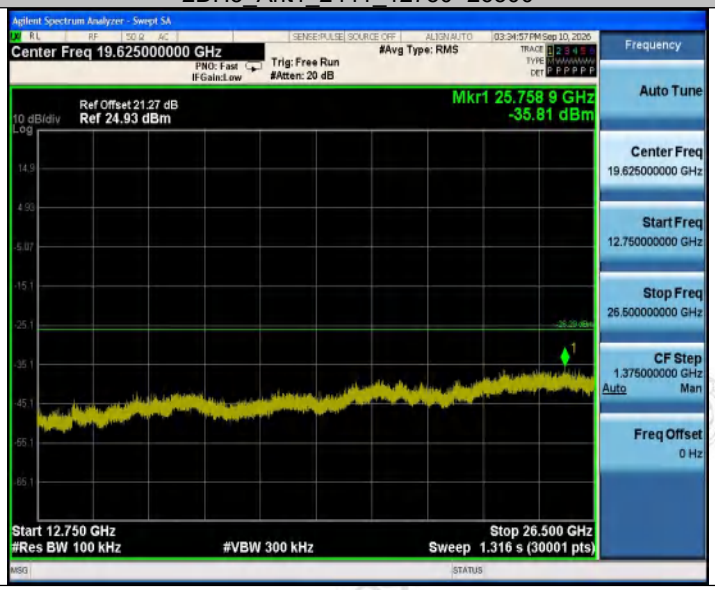

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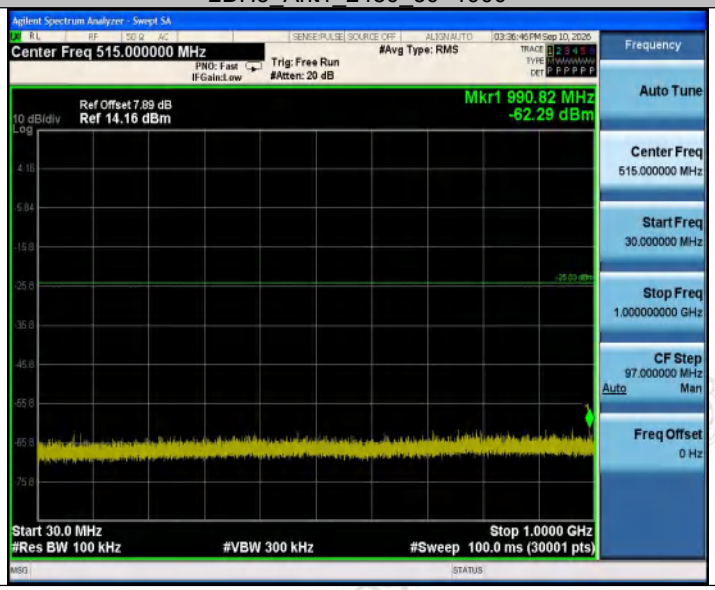

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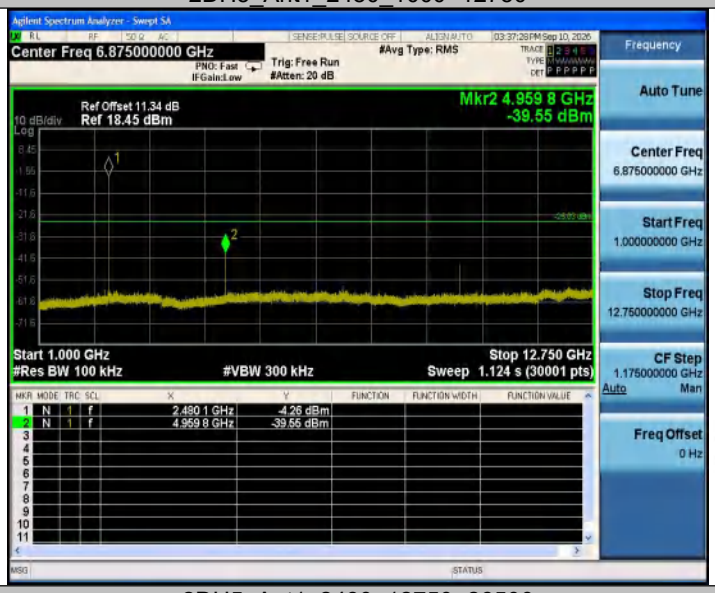


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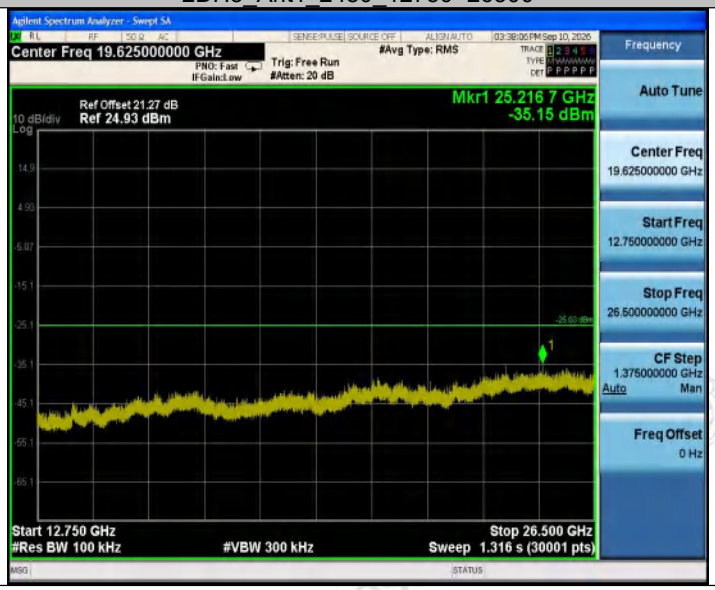

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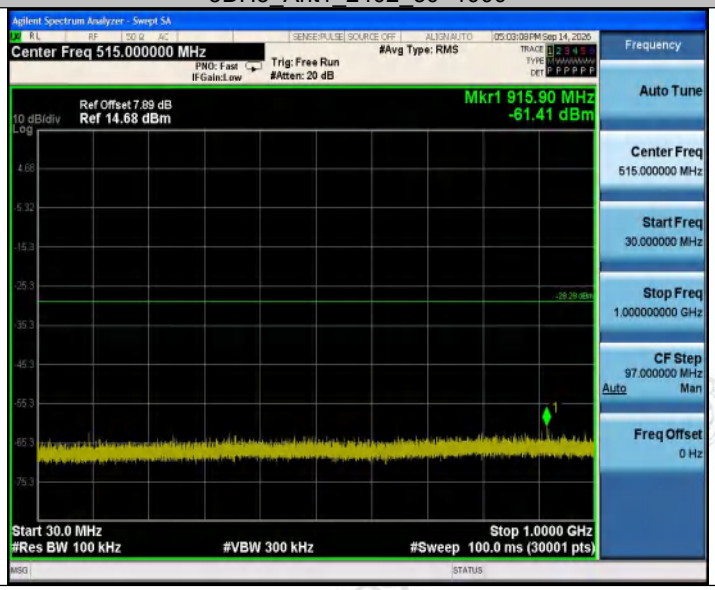

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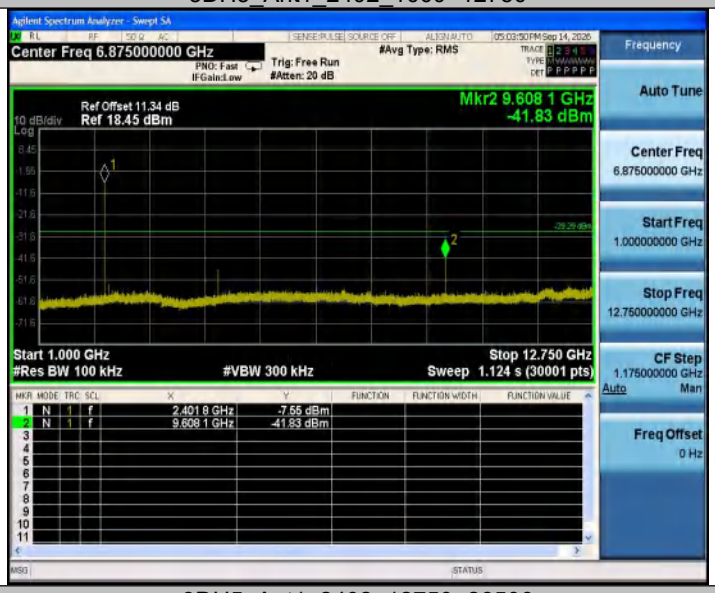


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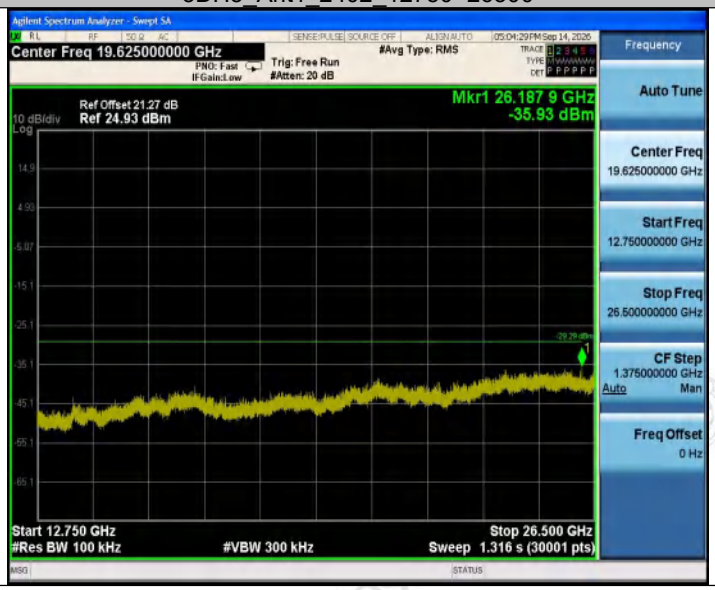

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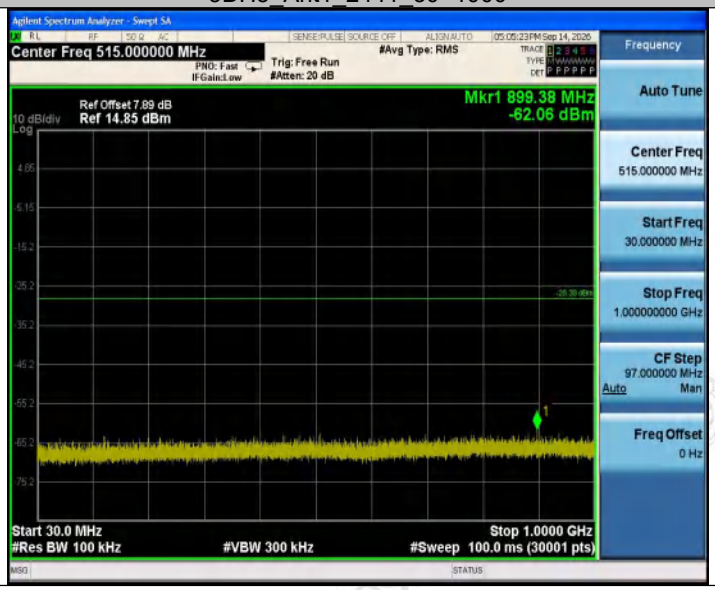

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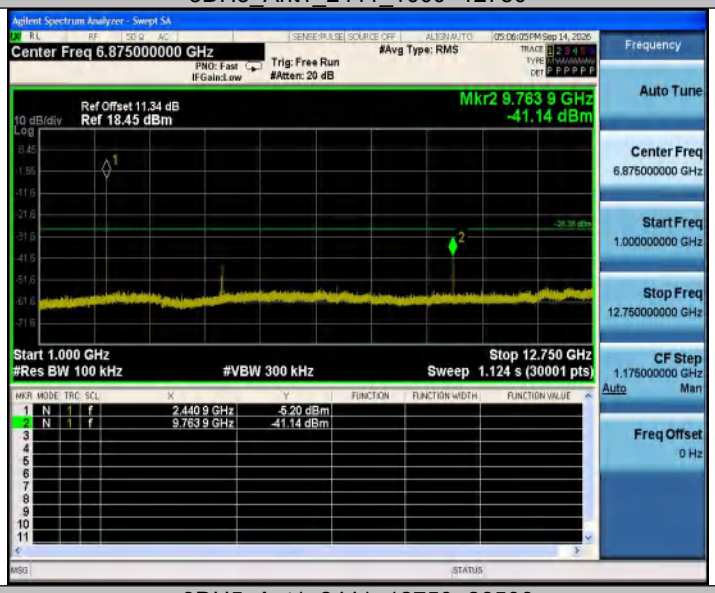


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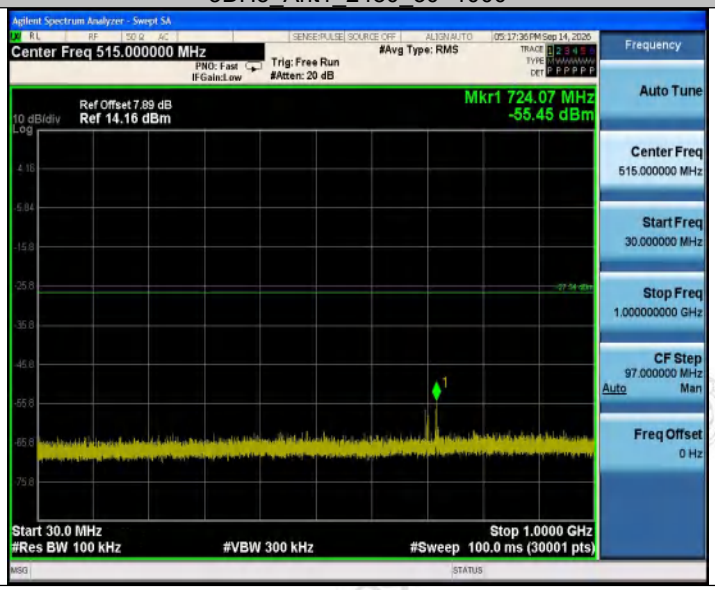

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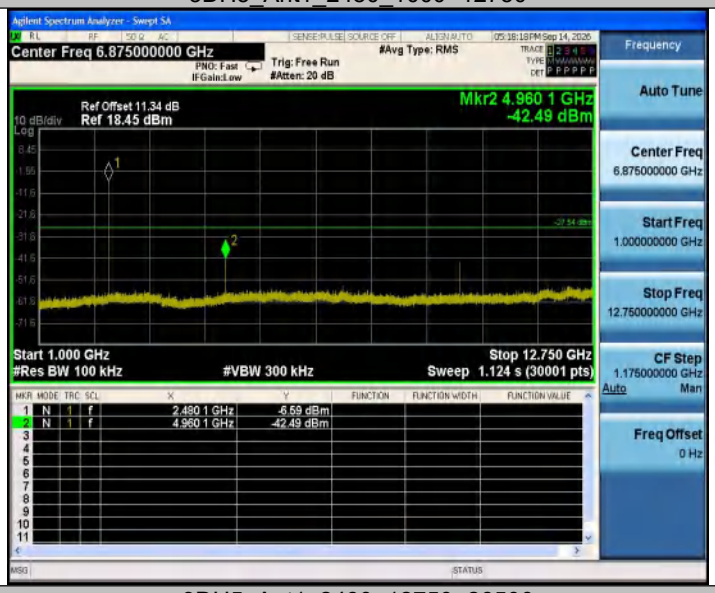


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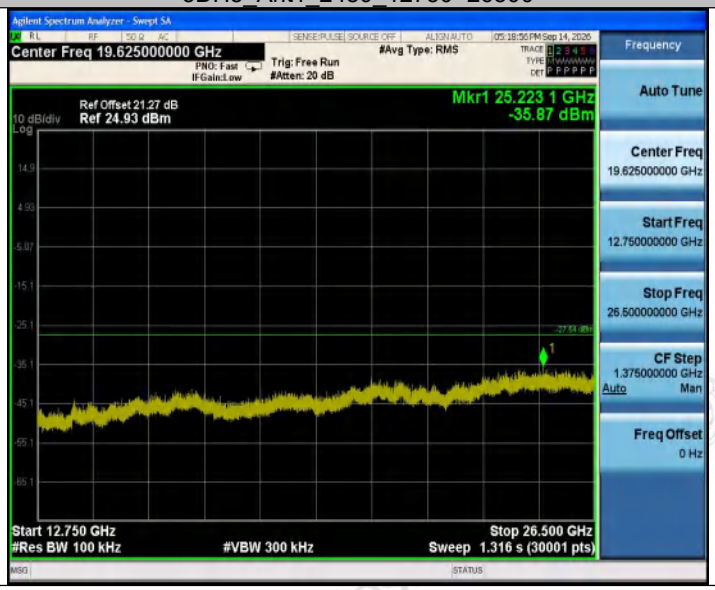

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