# TEST REPORT

| | |
|---|---|
| **Applicant:** | Sony Corporation |
| **EUT Description:** | GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax and NFC and GNSS |
| **Brand:** | Sony |
| **FCC ID:** | PY7-63277Y |
| **Standards:** | FCC 47 CFR Part 15 Subpart C |
| **Date of Receipt:** | 2025/03/07 |
| **Date of Test:** | 2025/03/07 to 2025/05/09 |
| **Date of Issue:** | 2025/05/09 |

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of the model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.

ACCREDITED
CERTIFICATE #7088.01

**Huang Kun**
**Approved By:**

**Chen Chengfu**
**Reviewed By:**


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# Revision History

| Rev. | Issue Date | Description | Revised by |
|---|---|---|---|
| 01 | 2025/05/09 | Original | Chen Chengfu |


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# Summary of Test Results

| Clause | FCC Part | Test Items | Result |
|---|---|---|---|
| 4.1 | §15.203/15.247(b) | Antenna Requirement | PASS |
| 4.2 | §15.207 | AC Power Line Conducted Emission | PASS |
| 4.3 | §15.247 (b)(1) | Output Power | PASS |
| 4.4 | §15.247 (a)(1) | Occupied Bandwidth | Reporting purposes only |
| 4.5 | §15.247 (a)(1) | Hopping Frequency Separation | PASS |
| 4.6 | §15.247 (a)(1)(iii) | Number Hopping Channels | PASS |
| 4.7 | §15.247 (a)(1)(iii) | Dwell Time | PASS |
| 4.8 | §15.247(d) | Band Edge for Conducted Emissions | PASS |
| 4.9 | §15.247(d) | Spurious RF Conducted Emissions | PASS |
| 4.10 | §15.205<br>§15.209 | Radiated Spurious emissions and Band Edge | PASS |
| Test Method: ANSI C63.10:2020, KDB 558074 D01 15.247 Mesa Guidance v05r02.<br>Remark: Pass is EUT meets standard requirements. | | | |


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# 1 General Description

## 1.1 Lab Information

### 1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014
Tel.: +86-755-27212361
Contact Email: info@towewireless.com

### 1.1.2 Test Facility / Accreditations

**A2LA (Certificate Number: 7088.01)**
This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

**FCC Designation No.: CN1353**
Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

**ISED CAB identifier: CN0152**
Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.
CAB identifier: CN0152
Company Number: 31000

## 1.2 Client Information

### 1.2.1 Applicant

| | |
|---|---|
| Applicant: | Sony Corporation |
| Address: | 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan |

### 1.2.2 Manufacturer

| | |
|---|---|
| Manufacturer: | Sony Corporation |
| Address: | 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan |


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## 1.3 Product Information

| | | |
|---|---|---|
| EUT Description: | GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax and NFC and GNSS | |
| Brand: | Sony | |
| Hardware Version: | A | |
| Software Version: | 0.144 (for RF Conducted)<br>0.166 (for RSE & AC power line) | |
| SN.: | RF Conducted | HQ652G00BA |
| | RSE & AC power line | HQ652D0088 |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) | |
| Modulation Type: | GFSK, π/4DQPSK, 8DPSK | |
| Frequency Range: | 2400 ~ 2483.5MHz | |
| Channel Frequency: | 2402 ~ 2480MHz | |
| Number of Channel: | 79 | |
| Hopping Channel Type: | Adaptive Frequency Hopping systems | |
| Antenna Type: | PIFA Antenna | |
| Antenna Gain: | Ant6 (dBi) | Ant7 (dBi) |
| | -3.0 | -1.1 |
| Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description. | | |


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# 2 Test Configuration

## 2.1 Test Channel

| Operation Frequency of each channel for GFSK, π/4DQPSK, 8DPSK | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 0 | 2402MHz | 20 | 2422MHz | 40 | 2442MHz | 60 | 2462MHz |
| 1 | 2403MHz | 21 | 2423MHz | 41 | 2443MHz | 61 | 2463MHz |
| 2 | 2404MHz | 22 | 2424MHz | 42 | 2444MHz | 62 | 2464MHz |
| 3 | 2405MHz | 23 | 2425MHz | 43 | 2445MHz | 63 | 2465MHz |
| 4 | 2406MHz | 24 | 2426MHz | 44 | 2446MHz | 64 | 2466MHz |
| 5 | 2407MHz | 25 | 2427MHz | 45 | 2447MHz | 65 | 2467MHz |
| 6 | 2408MHz | 26 | 2428MHz | 46 | 2448MHz | 66 | 2468MHz |
| 7 | 2409MHz | 27 | 2429MHz | 47 | 2449MHz | 67 | 2469MHz |
| 8 | 2410MHz | 28 | 2430MHz | 48 | 2450MHz | 68 | 2470MHz |
| 9 | 2411MHz | 29 | 2431MHz | 49 | 2451MHz | 69 | 2471MHz |
| 10 | 2412MHz | 30 | 2432MHz | 50 | 2452MHz | 70 | 2472MHz |
| 11 | 2413MHz | 31 | 2433MHz | 51 | 2453MHz | 71 | 2473MHz |
| 12 | 2414MHz | 32 | 2434MHz | 52 | 2454MHz | 72 | 2474MHz |
| 13 | 2415MHz | 33 | 2435MHz | 53 | 2455MHz | 73 | 2475MHz |
| 14 | 2416MHz | 34 | 2436MHz | 54 | 2456MHz | 74 | 2476MHz |
| 15 | 2417MHz | 35 | 2437MHz | 55 | 2457MHz | 75 | 2477MHz |
| 16 | 2418MHz | 36 | 2438MHz | 56 | 2458MHz | 76 | 2478MHz |
| 17 | 2419MHz | 37 | 2439MHz | 57 | 2459MHz | 77 | 2479MHz |
| 18 | 2420MHz | 38 | 2440MHz | 58 | 2460MHz | 78 | 2480MHz |
| 19 | 2421MHz | 39 | 2441MHz | 59 | 2461MHz | | |

Remark:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Test Channel | Test Frequency |
|---|---|
| The Lowest channel (CH0) | 2402MHz |
| The Middle channel (CH39) | 2441MHz |
| The Highest channel (CH78) | 2480MHz |


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## 2.2 Worst-case configuration and Mode

| Modulation Type | GFSK | | | π/4DQPSK | | | 8DPSK | | |
|---|---|---|---|---|---|---|---|---|---|
| | DH1 | DH3 | DH5 | 2DH1 | 2DH3 | 2DH5 | 3DH1 | 3DH3 | 3DH5 |
| Payload | 27 | 183 | 339 | 54 | 367 | 679 | 83 | 552 | 1021 |
| Hopping mode | Keep the EUT in hopping mode | | | | | | | | |
| No hopping mode | Keep the EUT was programmed to be in continuously transmitting mode | | | | | | | | |
| Normal Link | Keep the EUT operation to normal function. | | | | | | | | |

## 2.3 Support Unit used in test

The EUT has been tested as an independent unit.

## 2.4 Test Environment

| | |
|---|---|
| **Temperature:** | Normal: 15℃ ~ 35℃ |
| **Humidity:** | 45 ~ 56 % RH Ambient |
| **Voltage:** | DC 3.89V |
| **AC Voltage:** | AC 120V/60Hz for Conducted Emissions |
| Remark: The testing environment is within the scope of the EUT user manual and meets the requirements of the standard testing environment. | |

## 2.5 Test RF Cable

**For all conducted test items**: The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.

## 2.6 Modifications

No modifications were made during testing.


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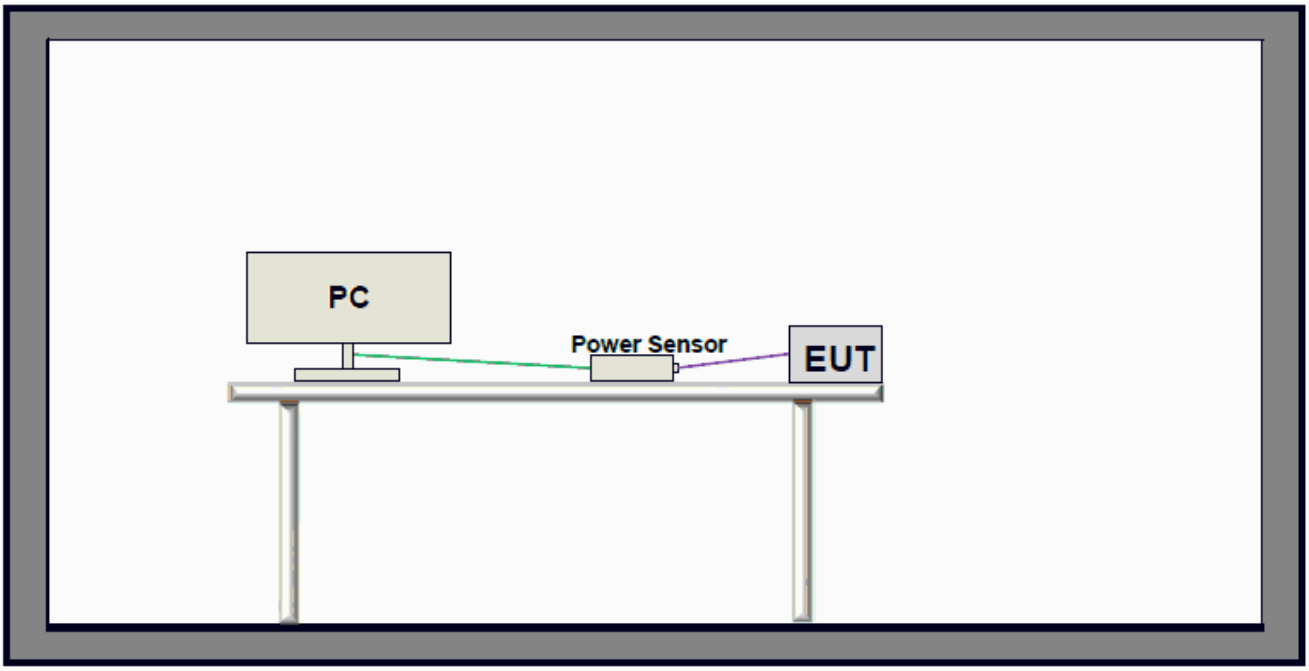
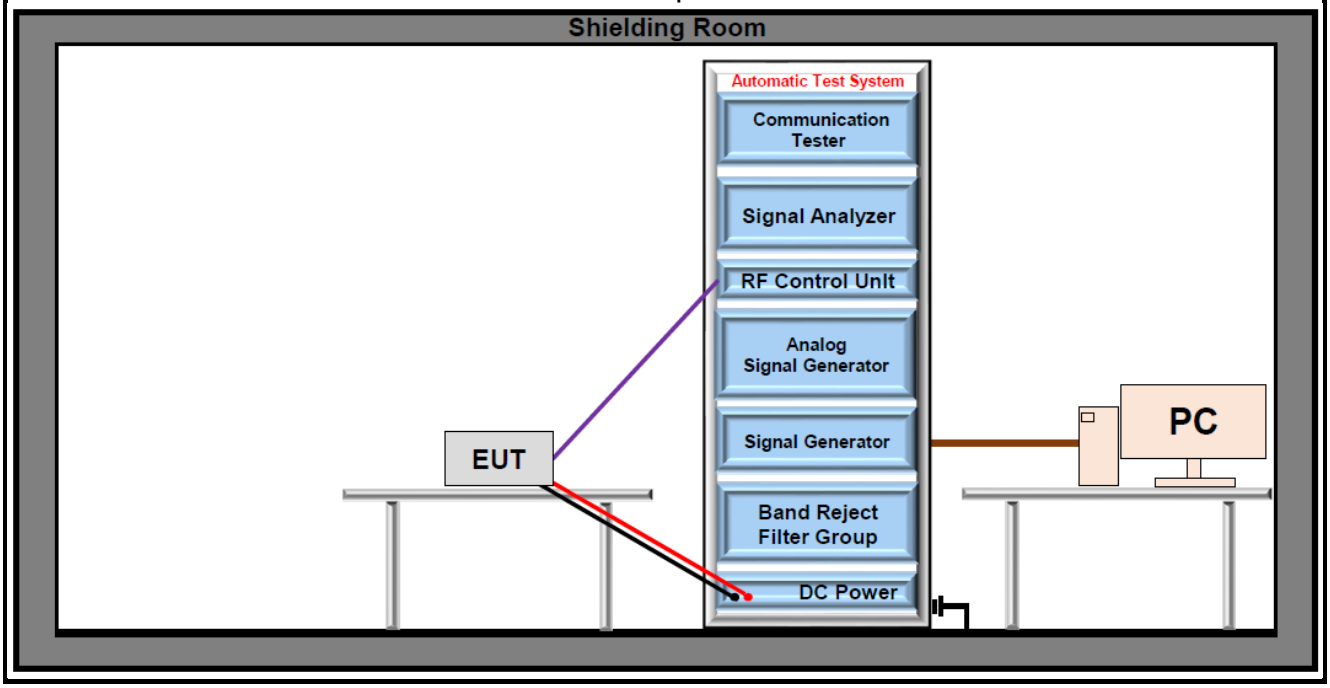
## 2.7 Test Setup Diagram

### 2.7.1 Conducted Configuration

Setup 1




Setup 2





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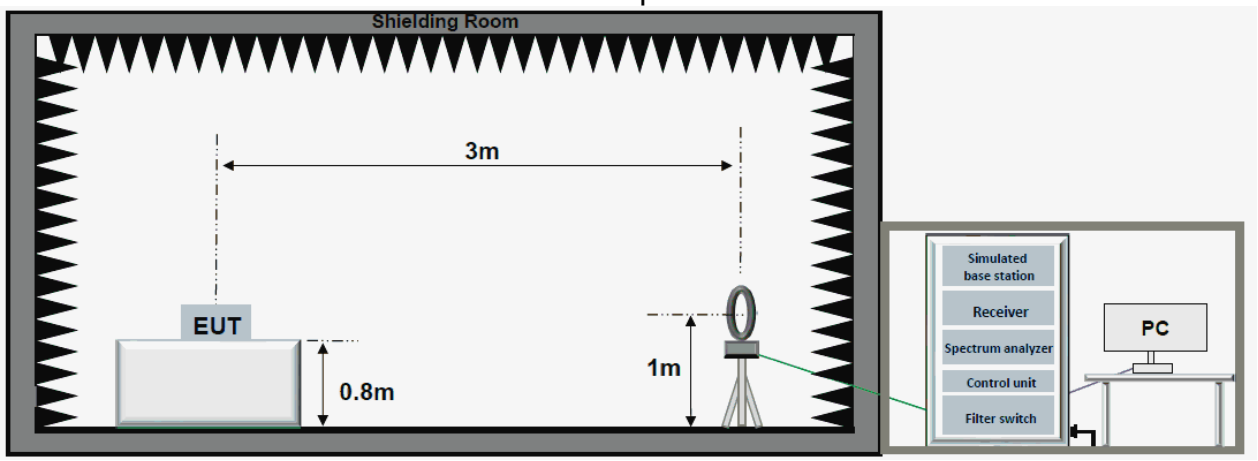
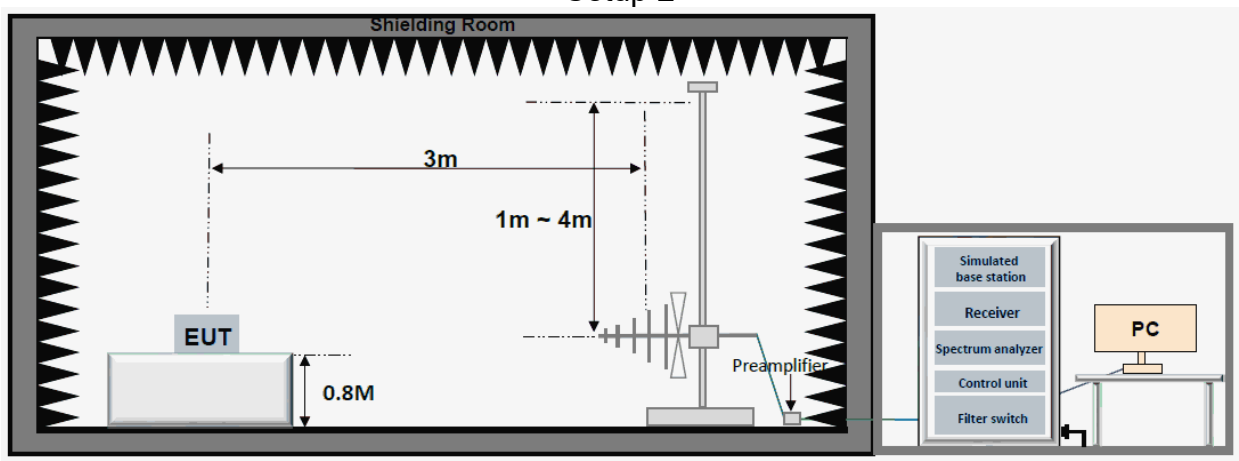
### 2.7.2 Radiated Configuration

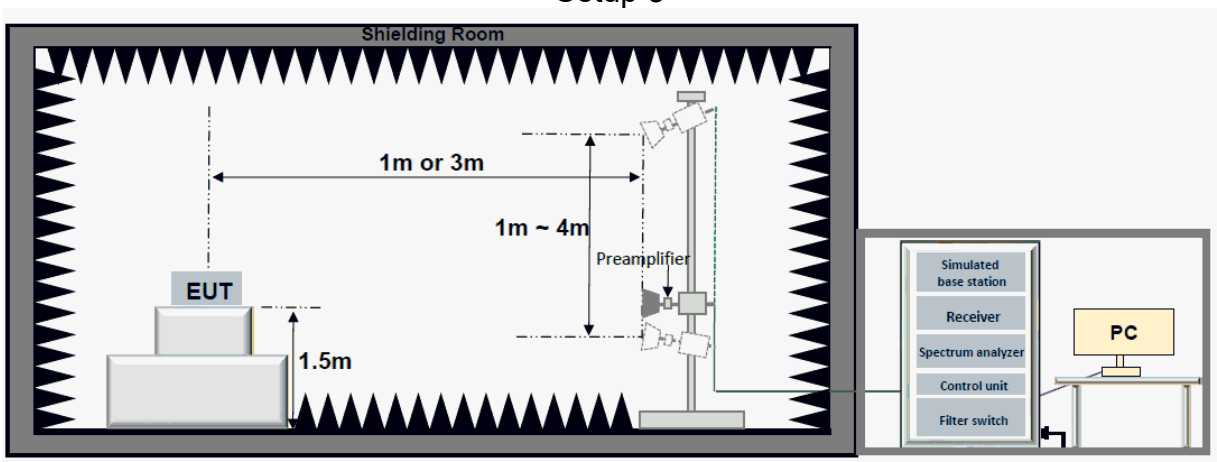
Setup 1




Setup 2




Setup 3




## 2.8 Accessory

| Name | Model | Length (cm) | Shielded (Y/N) | Manufacturer |
|---|---|---|---|---|
| Adapter | XQZ-UC1 | / | / | Sony Corporation |
| USB Cable | XQZ-UB1 | 100 | Y | Sony Corporation |
| Earphone | MDR-EX15AP | 125 | / | Sony Corporation |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# 3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable to recognized national standards.

## 3.1 Test Equipment List

| RF Conducted | | | | | |
|---|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **S.N.** | **Last Due** | **Cal Due** |
| Signal Analyzer | Keysight | N9020A | US46470429 | 2024/03/25 | 2025/03/24 |
| | | | | 2025/03/14 | 2026/03/13 |
| Signal Generator | R&S | SMR20 | 101027 | 2024/03/25 | 2025/03/24 |
| | | | | 2025/03/11 | 2026/03/10 |
| Vector Signal Generator | R&S | SMM100A | 549353 | 2024/05/30 | 2025/05/29 |
| Power Sensor | Anritsu | MA24408A | 12520 | 2024/05/30 | 2025/05/29 |
| RF Control Unit | Tonscend | JS0806-2 | 23C80620671 | 2024/05/30 | 2025/05/29 |
| EXA Signal Analyzer, Multi-touch | Keysight | N9010B | MY63440541 | 2024/05/30 | 2025/05/29 |
| Measurement Software | Tonscend | TS1120-3 | 10659 | N/A | N/A |

| Radiated Emission | | | | | |
|---|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **S.N.** | **Last Due** | **Cal Due** |
| Biconic Logarithmic Periodic Antennas | Schwarzbeck | VULB9163 | 1643 | 2023/06/25 | 2025/06/24 |
| Double-Ridged Horn Antennas | Schwarzbeck | BBHA 9120D | 2809 | 2023/06/25 | 2025/06/24 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 1290 | 2023/06/25 | 2025/06/24 |
| Loop Antenna | Schwarzbeck | FMZB 1519C | 1519C-028 | 2023/06/29 | 2025/06/28 |
| Signal Analyzer | Keysight | N9020A | MY49100252 | 2024/03/25 | 2025/03/24 |
| | | | | 2025/03/11 | 2026/03/10 |
| EXA Signal Analyzer, Multi-touch | Keysight | N9010B | MY63440541 | 2024/05/30 | 2025/05/29 |
| Wideband Radio Communication Tester | R&S | CMW500 | 150645 | 2024/03/25 | 2025/03/24 |
| | | | | 2025/03/11 | 2026/03/10 |
| Low Noise Amplifier | Tonscend | TAP9K3G40 | AP23A8060273 | 2023/04/08 | 2025/04/07 |
| | | | | 2025/03/11 | 2027/03/10 |
| Low Noise Amplifier | Tonscend | TAP01018050 | AP22G806258 | 2023/04/08 | 2025/04/07 |
| | | | | 2025/03/11 | 2027/03/10 |
| Low Noise Amplifier | Tonscend | TAP18040048 | AP22G806247 | 2023/04/08 | 2025/04/07 |
| | | | | 2025/03/11 | 2027/03/10 |
| Hygrometer | BINGYU | HTC-1 | N/A | 2023/06/01 | 2025/05/31 |
| Band Reject Filter Group | Townshend | JS0806-F | 23A806F0652 | N/A | N/A |
| Test Software | Tonscend | TS+ | Version: 5.0.0 | N/A | N/A |


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| Conducted Emission | | | | | |
|---|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **S.N.** | **Last Due** | **Cal Due** |
| EMI Tester Receiver | Rohde & Schwarz | ESR3 | 103108 | 2024/05/31 | 2025/05/30 |
| LISN | Rohde & Schwarz | ENV 216 | 102836 | 2025/01/04 | 2026/01/03 |
| Test software | Rohde & Schwarz | ELEKTRA V4.61 | N/A | N/A | N/A |


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## 3.2 Measurement Uncertainty

| Parameter | $U_{lab}$ |
|---|---|
| Frequency Error | 679.98Hz |
| Output Power | 0.76dB |
| Conducted Spurious Emissions | 2.22dB |
| Conducted Emissions(150kHz~30MHz) | 2.43dB |
| Radiated Emissions(9kHz~30MHz) | 2.40dB |
| Radiated Emissions(30MHz~1000MHz) | 4.66dB |
| Radiated Emissions(1GHz~18GHz) | 5.42dB |
| Radiated Emissions(18GHz~40GHz) | 5.46dB |

Uncertainty figures are valid to a confidence level of 95%


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# 4 Test results

## 4.1 Antenna Requirement

| **Standard Applicable:** | 47 CFR Part 15C Section 15.203 /247(b) |
|---|---|
| 15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.<br>15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. | |
| The antenna gain and type as provided by the manufacturer are as follows:<br>The antenna Type is PIFA Antenna. With Antenna gain is -3.0(Ant6); -1.1(Ant7);<br>Antenna Anti-Replacement Construction: An embedded-in antenna design is used. | |


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## 4.2 AC Power Line Conducted Emissions

**Limits**

| Frequency range (MHz) | 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. | | |

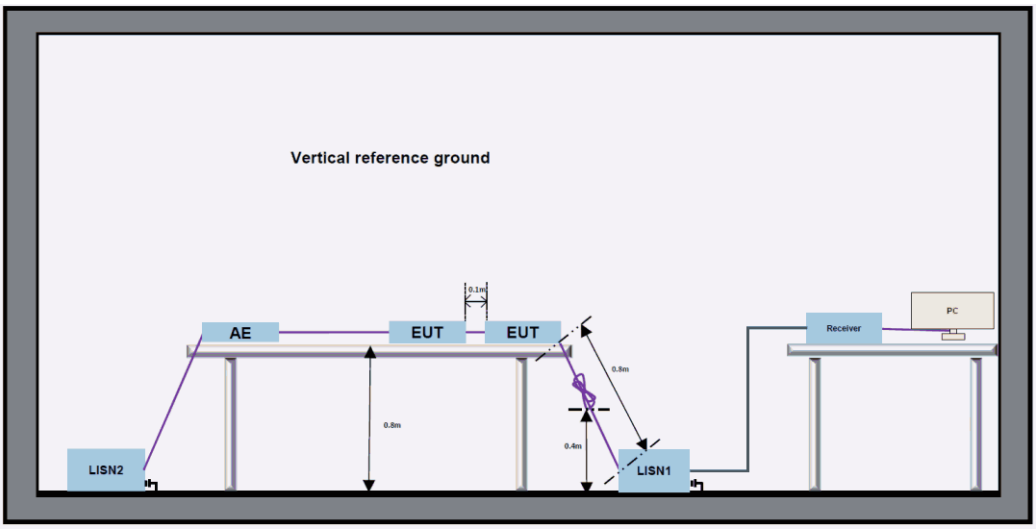
**Test Procedure**

ANSI C63.10:2020, Section 6.2.

**Test Settings**

1. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
3. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
4. The receiver is set to a resolution bandwidth of 9kHz. Peak detection s used netless otherwise noted as quasi-peak or average.
5. AC Power Line Conducted Emissions, the channel with the highest output power was tested.
6. Both sides of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

**Test Setup**




**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.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**Test Result:**

| Test mode: | BT | | |
|---|---|---|---|
| Test Voltage: | AC 120V / 60Hz | Phase: | Line |

| Rg | Frequency [MHz] | QPK Level [dBµV] | QPK Limit [dBµV] | QPK Margin [dB] | CAV Level [dBµV] | CAV: AVG Limit [dBµV] | CAV Margin [dB] | Correction [dB] | Line |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.150 | 53.80 | 66.00 | 12.20 | 23.05 | 56.00 | 32.95 | 9.57 | L1 |
| 2 | 0.159 | 53.48 | 65.52 | 12.04 | 25.75 | 55.52 | 29.77 | 9.52 | L1 |
| 3 | 0.173 | 52.50 | 64.84 | 12.34 | 21.32 | 54.84 | 33.52 | 9.48 | L1 |
| 4 | 0.186 | 51.37 | 64.21 | 12.84 | 21.81 | 54.21 | 32.40 | 9.50 | L1 |
| 5 | 1.865 | 32.17 | 56.00 | 23.83 | 17.08 | 46.00 | 28.92 | 9.99 | L1 |
| 6 | 12.935 | 25.42 | 60.00 | 34.58 | 14.21 | 50.00 | 35.79 | 11.73 | L1 |

Note:
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Margin[dB] = Limit[dBµV] - Level[dBµV]


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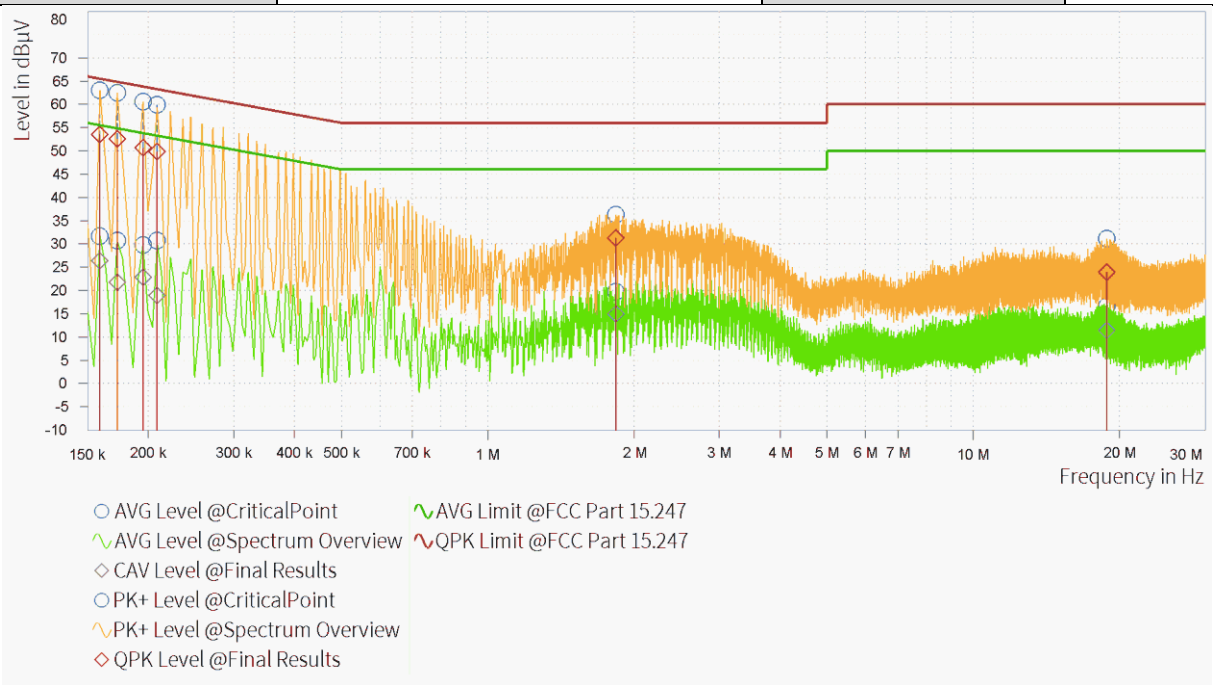
| Test mode: | BT | | |
|---|---|---|---|
| Test Voltage: | AC 120V / 60Hz | Phase: | Neutral |




| Rg | Frequency [MHz] | QPK Level [dBµV] | QPK Limit [dBµV] | QPK Margin [dB] | CAV Level [dBµV] | CAV: AVG Limit [dBµV] | CAV Margin [dB] | Correction [dB] | Line |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.159 | 53.52 | 65.52 | 12.00 | 26.39 | 55.52 | 29.13 | 9.63 | N |
| 2 | 0.173 | 52.63 | 64.84 | 12.21 | 21.79 | 54.84 | 33.05 | 9.64 | N |
| 3 | 0.195 | 50.69 | 63.82 | 13.13 | 22.84 | 53.82 | 30.98 | 9.69 | N |
| 4 | 0.209 | 49.90 | 63.26 | 13.36 | 18.89 | 53.26 | 34.37 | 9.70 | N |
| 5 | 1.833 | 31.26 | 56.00 | 24.74 | 14.98 | 46.00 | 31.02 | 9.95 | N |
| 6 | 18.839 | 23.92 | 60.00 | 36.08 | 11.45 | 50.00 | 38.55 | 12.66 | N |

Note:
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Margin[dB] = Limit[dBµV] - Level[dBµV]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## 4.3 Output Power

**Limits**

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: 1watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

**Test Procedure**

ANSI C63.10:2020 Section 7.8.5

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. The power output was measured on the EUT antenna port using RF Cable with attenuator connected to a power meter via wideband power sensor.
3. Measure and record the results in the test report.

**Test Setup**

Refer to section 2.7.1- Setup 1 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.4 Occupied Bandwidth

**Limits**

None, for reporting purposes only.

**Test Procedure**

ANSI C63.10:2020 Section 6.9.2 and 6.9.3

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. The transmitter output is connected to a spectrum analyzer.
3. RBW = 1% - 5%OBW
4. VBW = 3 times the RBW
5. Span = Approximately 2 to 5times the 20dB bandwidth
6. Sweep = Auto
7. Detector = Peak
8. Trace = Max hold.
9. The trace was allowed to stabilize
10. Measure and record the results in the test report.

**Test Notes**

The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 20dB bandwidth measurement. The "X" dB bandwidth parameter was set to X= 20. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.5 Hopping Frequency Separation

**Limits**

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 25kHz 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 Procedure**

ANSI C63.10:2020 Section 7.8.2

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously
2. Enable the EUT hopping function
3. The transmitter output is connected to a spectrum analyzer
4. RBW = 30% of channel spacing. Adjust as necessary to best identify center of each individual channel
5. VBW ≥ RBW
6. Span = Wide enough to capture the peaks of two adjacent channels
7. Sweep = Auto
8. Detector = Peak
9. Trace = Max hold
10. The trace was allowed to stabilize
11. Measure and record the results in the test report

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.6 Number of Hopping Channels

**Limits**

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

**Test Procedure**

ANSI C63.10:2020 Section 7.8.3

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously
2. Enable the EUT hopping function
3. The transmitter output is connected to a spectrum analyzer
4. RBW < 30% of channel spacing or 20dB bandwidth, whichever is smaller.
5. VBW ≥ RBW
6. Span = The frequency band of operation
7. Sweep = Auto
8. Detector = Peak
9. Trace = Max hold
10. The trace was allowed to stabilize
11. Measure and record the results in the test report.

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.7 Dwell Time

**Limits**

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.

**Test Procedure**

ANSI C63.10:2020 Section 7.8.4

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously
2. Enable the EUT hopping function
3. The transmitter output is connected to a spectrum analyzer
4. RBW ≤ channel spacing and >> 1/T, where T is expected dwell time per channel
5. VBW ≥ RBW
6. Span = Zero span, centered on a hopping channel
7. Sweep = As necessary to capture the entire dwell time per hopping channel
8. Detector = Peak
9. Trace = Max hold
10. The trace was allowed to stabilize
11. Measure and record the results in the test report

**Test Setup**

1. For Normal mode, The average time of occupancy in the specified 3.16 second. Period time=(79 channels *0.4s), Total Dwell time = Total Hops* Burst width.
2. For AFH mode, The average time of occupancy in the specified 0.8 second. Period time= (20 channels *0.4s), Total Dwell time = Total Hops* Burst width.

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.8 Band Edge for Conducted Emissions

**Limits**

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 15.247(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

**Test Procedure**

ANSI C63.10:2020 Section 7.8.7.2

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously
2. Activate frequency hopping function if necessary
3. The transmitter output is connected to a spectrum analyzer
4. RBW = 100kHz
5. VBW = 300kHz
6. Point ≥ 2 x span/RBW
7. Sweep = Auto
8. Detector = Peak
9. Trace = Max hold
10. The trace was allowed to stabilize
11. Measure and record the results in the test report

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.9 Spurious RF Conducted Emissions

**Limits**

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 15.247(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

**Test Procedure**

ANSI C63.10:2020 Section 7.8.7

**Test Settings**

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. Activate frequency hopping function if necessary.
3. The transmitter output is connected to a spectrum analyzer
4. The spectrum from 30MHz - 26.5GHz
5. RBW = 100kHz
6. VBW = 300kHz
7. Sweep = Auto
8. Detector = Peak
9. Trace = Max hold
10. The trace was allowed to stabilize
11. Measure and record the results in the test report

**Test Setup**

Refer to section 2.7.1- Setup 2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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## 4.10 Radiated Spurious Emissions and Band Edge

**Limits**

Spurious emissions are permitted in an of the frequency bands:

| MHz | MHz | MHz | MHz | GHz | GHz |
|---|---|---|---|---|---|
| 0.090 - 0.110 | 12.29 - 12.293 | 149.9 - 150.05 | 1660 - 1710 | 4.5 - 5.15 | 14.47 - 14.5 |
| 0.495 - 0.505 | 12.51975 - 1252025 | 156.52475 - 156.52525 | 1718.8 - 1722.2 | 5.35 - 5.46 | 15.35 - 16.2 |
| 2.1735 - 2.1905 | 12.5767 - 12.57725 | 156.7 - 156.9 | 2200 - 2300 | 7.25 - 7.75 | 17.7 - 21.4 |
| 4.125 - 128 | 13.36 - 13.41 | 162.0125 - 167.17 | 2310 - 2390 | 8.025 - 8.5 | 22.01 - 23.12 |
| 4.17725 - 4.17775 | 16.42 - 16.423 | 167.72 - 173.2 | 2483.5 - 2500 | 9.0 - 9.2 | 23.6 - 24.0 |
| 4.20725 - 4.20775 | 16.69475 - 16.69525 | 240 - 285 | 2655 - 2900 | 9.3 - 9.5 | 31.2 - 31.8 |
| 6.215 - 6.218 | 1680425 - 1680475 | 322 - 335.4 | 3260 - 3267 | 10.6 - 12.7 | 36.43 - 36.5 |
| 6.26775 - 6.26825 | 25.5 - 25.67 | 399.9 - 410 | 3332 - 3339 | 13.25 - 13.4 | |
| 6.31175 - 6.31225 | 37.5 - 38.25 | 608 - 614 | 3345.8 - 3358 | | |
| 8.291 - 8.294 | 73 - 74.6 | 960 - 1240 | 3600 - 4400 | | |
| 8.362 - 8.366 | 74.8 - 75.2 | 1300 - 1427 | | | |
| 8.37625 - 8.38675 | 108 - 121.94 | 1435 - 1626.5 | | | |
| 8.41425 - 8.41475 | 123 - 138 | 1645.5 - 1646.5 | | | |

Radiated disturbance of an intentional radiator:

| Frequency | Field strength (μV/m) | Limit (dBμV/m | Remark | Measurement distance (m) |
|---|---|---|---|---|
| 0.009MHz-0.490MHz | 2400/F(kHz) | - | - | 300 |
| 0.490MHz-1.705MHz | 24000/F(kHz) | - | - | 30 |
| 1.705MHz-30MHz | 30 | - | - | 30 |
| 30MHz-88MHz | 100 | 40.0 | Quasi-peak | 3 |
| 88MHz-216MHz | 150 | 43.5 | Quasi-peak | 3 |
| 216MHz-960MHz | 200 | 46.0 | Quasi-peak | 3 |
| 960MHz-1GHz | 500 | 54.0 | Quasi-peak | 3 |
| Above 1GHz | 500 | 74.0 | Peak | 3 |
| | | 54.0 | Average | |

**Test Procedure**

ANSI C63.10:2020 Section 6.4 & 6.5 & 6.6

**Test Settings**

1. For radiated emissions measurements performed at frequencies less than or equal to 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the reference ground plane.
2. For radiated emissions measurements performed at frequencies above 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the ground plane.
3. Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1m to 4m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e, field strength or received power), when orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25cm.
4. For each suspected emission, the EUT was ranged its worst case and then tune the antenna tower(from 1~4m) and turntable(from 0~360°) find the maximum reading. Preamplifier and a high pass filter are used for the test in order get better signal level comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. 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.
7. spectrum analyzer setting:

   Measurements Below 1000MHz: RBW = 120 kHz; VBW ≥ 300 kHz; Detector = Peak

   Measurements Above 1000MHz: RBW = 1 MHz; VBW ≥ 3 MHz; Detector = Peak


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Average Measurements Above 1000MHz:

RBW = 1 MHz, VBW ≥ 1/T, with peak detector for average measurements.

8. The field strength is calculated by adding the Antenna Factor, Cable Factor. The basic equation with a sample calculation is as follows:

   Level = Reading(dBμV) + AF(dB/m) + Factor(dB):

   AF = Antenna Factor(dB/m)

   Factor = Cable Factor(dB) - Preamplifier gain(dB)

   Margin = Limit(dBμV/m) – Level(dBμV/m)
9. Repeat above procedures until all frequencies measured was complete.
10. Measure and record the results in the test report.

**Test Notes**

1. Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
2. Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. the disturbance between 9kHz to 30MHz, 30MHz-1GHz and 18GHz to 40GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be recorded, so only the harmonics had been displayed.
3. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

**Test Setup**

Refer to section 2.7.2 for details.

**Measuring Instruments**

The measuring equipment is listed in the section 3.1 of this test report.

**Test Result**

The detailed test data see: **Appendix.**


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# 5 Test Setup Photos

The detailed test data see: **Appendix-A BTWIFI Setup Photos**


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# Appendix

## 20dB Emission Bandwidth

### Test Result

| TestMode | Antenna | Frequency[MHz] | 20dB EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant6 | 2402 | 0.948 | 2401.538 | 2402.486 | --- | --- |
| DH5 | Ant7 | 2402 | 0.948 | 2401.535 | 2402.483 | --- | --- |
| DH5 | Ant7 | 2441 | 0.942 | 2440.541 | 2441.483 | --- | --- |
| DH5 | Ant6 | 2441 | 0.942 | 2440.541 | 2441.483 | --- | --- |
| DH5 | Ant7 | 2480 | 0.936 | 2479.538 | 2480.474 | --- | --- |
| DH5 | Ant6 | 2480 | 0.924 | 2479.541 | 2480.465 | --- | --- |
| 2DH5 | Ant7 | 2402 | 1.314 | 2401.337 | 2402.651 | --- | --- |
| 2DH5 | Ant6 | 2402 | 1.338 | 2401.325 | 2402.663 | --- | --- |
| 2DH5 | Ant6 | 2441 | 1.284 | 2440.361 | 2441.645 | --- | --- |
| 2DH5 | Ant7 | 2441 | 1.290 | 2440.361 | 2441.651 | --- | --- |
| 2DH5 | Ant6 | 2480 | 1.320 | 2479.334 | 2480.654 | --- | --- |
| 2DH5 | Ant7 | 2480 | 1.323 | 2479.334 | 2480.657 | --- | --- |
| 3DH5 | Ant6 | 2402 | 1.347 | 2401.319 | 2402.666 | --- | --- |
| 3DH5 | Ant7 | 2402 | 1.317 | 2401.343 | 2402.660 | --- | --- |
| 3DH5 | Ant6 | 2441 | 1.290 | 2440.358 | 2441.648 | --- | --- |
| 3DH5 | Ant7 | 2441 | 1.308 | 2440.346 | 2441.654 | --- | --- |
| 3DH5 | Ant6 | 2480 | 1.302 | 2479.352 | 2480.654 | --- | --- |
| 3DH5 | Ant7 | 2480 | 1.305 | 2479.346 | 2480.651 | --- | --- |


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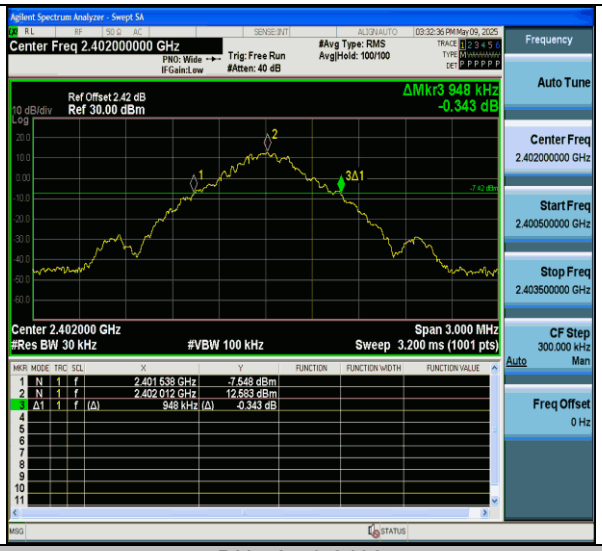
## Test Graphs




DH5-Ant6-2402

DH5-Ant7-2402

DH5-Ant7-2441

DH5-Ant6-2441

DH5-Ant7-2480

DH5-Ant6-2480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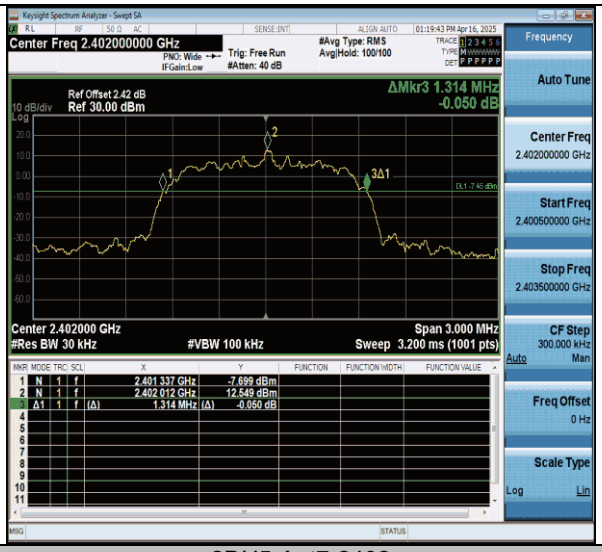


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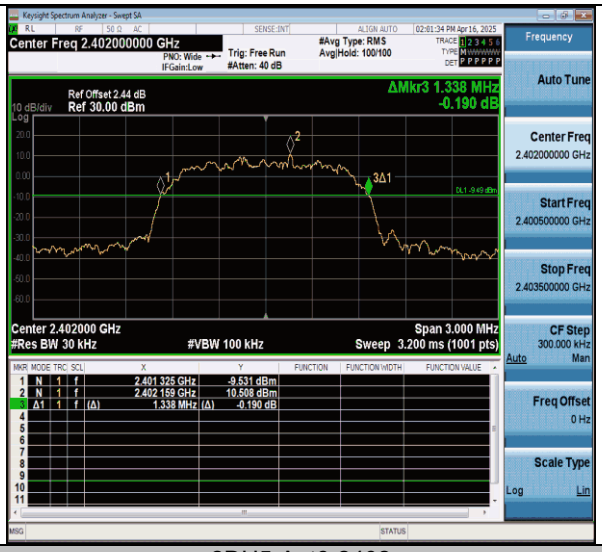


2DH5-Ant6-2402

2DH5-Ant6-2441

2DH5-Ant7-2441

2DH5-Ant6-2480

2DH5-Ant7-2480


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3DH5-Ant6-2402

3DH5-Ant7-2402

3DH5-Ant6-2441

3DH5-Ant7-2441

3DH5-Ant6-2480

3DH5-Ant7-2480


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# Occupied Channel Bandwidth

## Test Result

| TestMode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant6 | 2402 | 0.83358 | 2401.5822 | 2402.4157 | --- | --- |
| DH5 | Ant7 | 2402 | 0.82701 | 2401.5810 | 2402.4080 | --- | --- |
| DH5 | Ant7 | 2441 | 0.83003 | 2440.5822 | 2441.4123 | --- | --- |
| DH5 | Ant6 | 2441 | 0.84075 | 2440.5719 | 2441.4127 | --- | --- |
| DH5 | Ant7 | 2480 | 0.83892 | 2479.5763 | 2480.4152 | --- | --- |
| DH5 | Ant6 | 2480 | 0.82543 | 2479.5812 | 2480.4066 | --- | --- |
| 2DH5 | Ant7 | 2402 | 1.1883 | 2401.4007 | 2402.5890 | --- | --- |
| 2DH5 | Ant6 | 2402 | 1.1816 | 2401.4055 | 2402.5871 | --- | --- |
| 2DH5 | Ant6 | 2441 | 1.1936 | 2440.3980 | 2441.5916 | --- | --- |
| 2DH5 | Ant7 | 2441 | 1.1839 | 2440.4057 | 2441.5896 | --- | --- |
| 2DH5 | Ant6 | 2480 | 1.1906 | 2479.4018 | 2480.5924 | --- | --- |
| 2DH5 | Ant7 | 2480 | 1.1774 | 2479.4064 | 2480.5838 | --- | --- |
| 3DH5 | Ant6 | 2402 | 1.2006 | 2401.3941 | 2402.5947 | --- | --- |
| 3DH5 | Ant7 | 2402 | 1.2002 | 2401.3960 | 2402.5962 | --- | --- |
| 3DH5 | Ant6 | 2441 | 1.1986 | 2440.3959 | 2441.5945 | --- | --- |
| 3DH5 | Ant7 | 2441 | 1.1869 | 2440.4038 | 2441.5907 | --- | --- |
| 3DH5 | Ant6 | 2480 | 1.1983 | 2479.3938 | 2480.5921 | --- | --- |
| 3DH5 | Ant7 | 2480 | 1.1850 | 2479.4031 | 2480.5881 | --- | --- |


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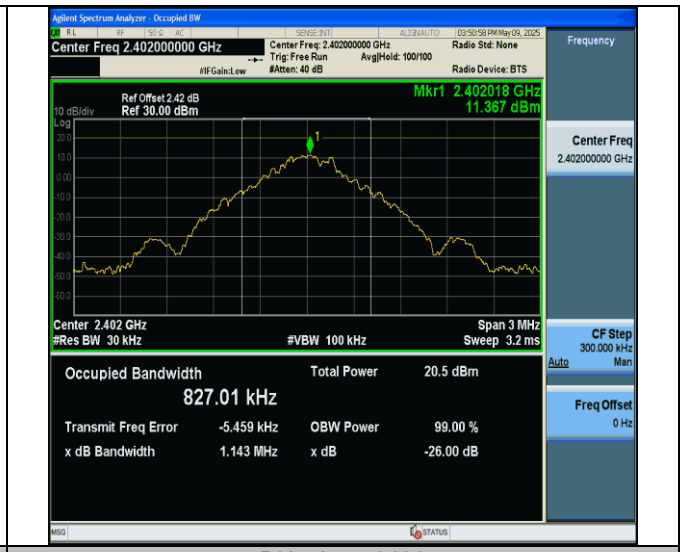
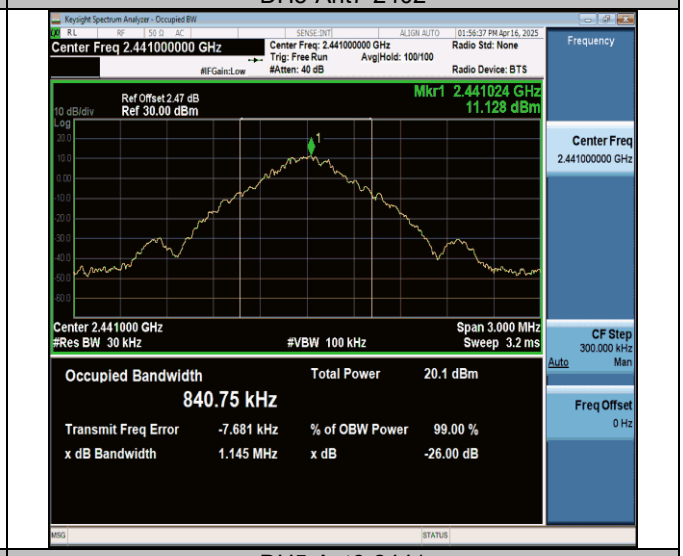
## Test Graphs

DH5-Ant6-2402




DH5-Ant7-2402

DH5-Ant7-2441




DH5-Ant6-2441

DH5-Ant7-2480

DH5-Ant6-2480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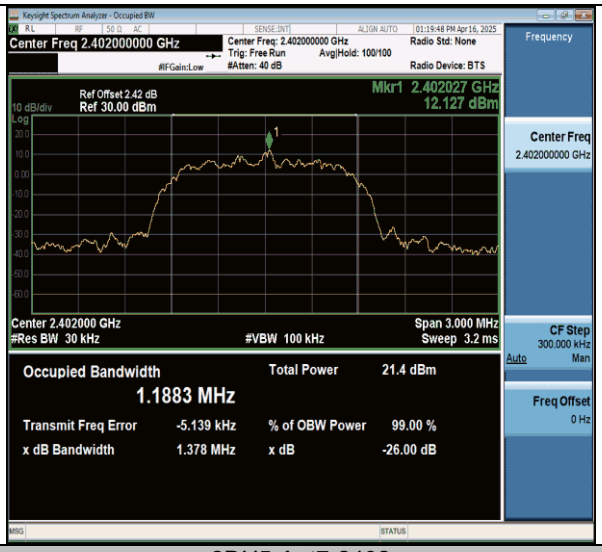


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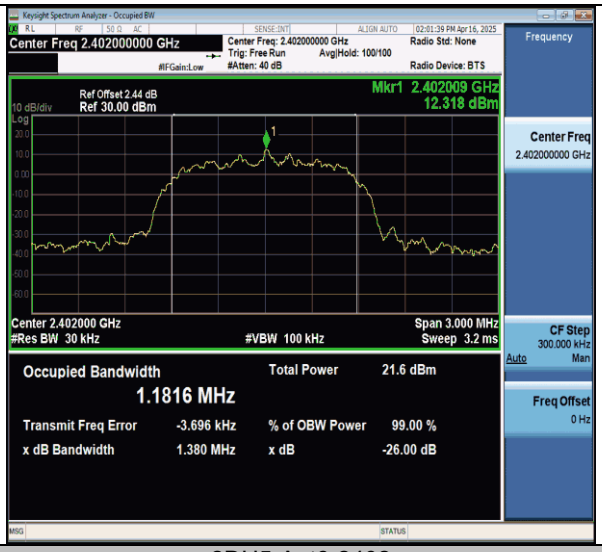
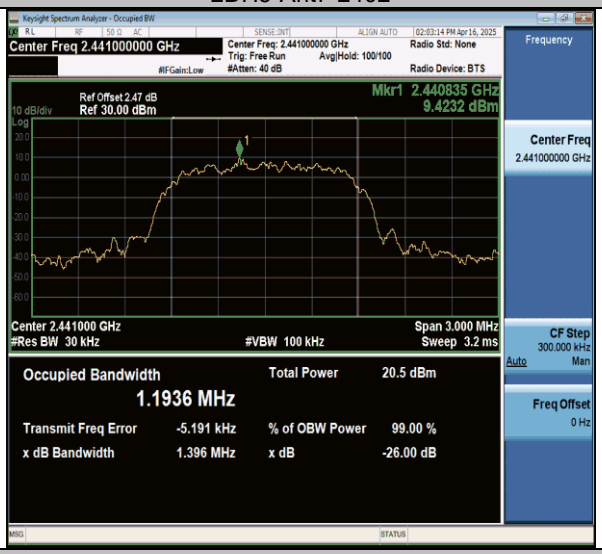



2DH5-Ant6-2402

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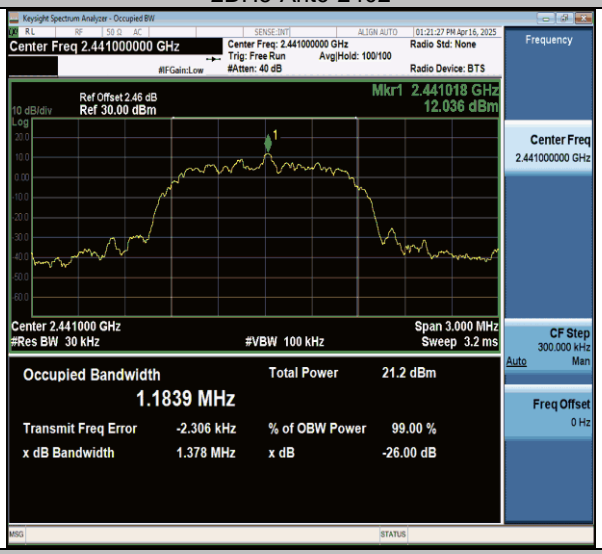
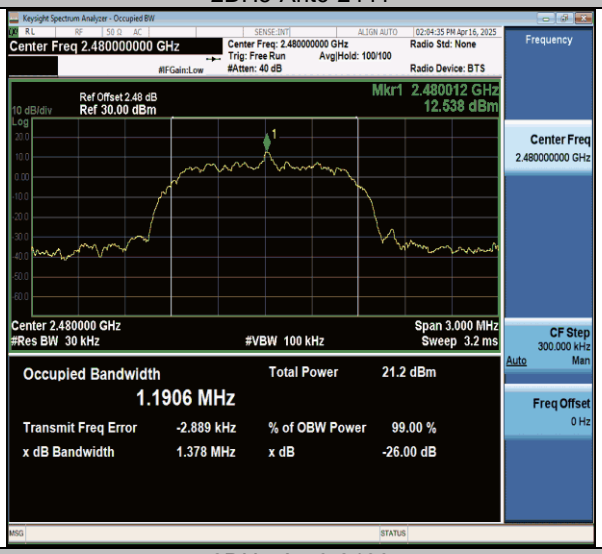
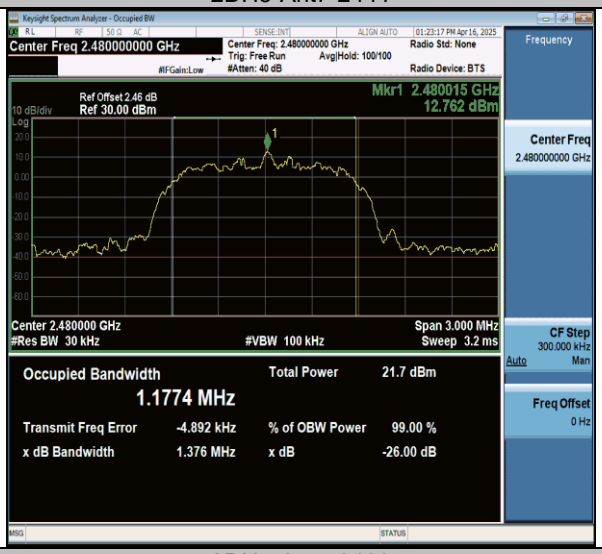



2DH5-Ant7-2441




2DH5-Ant6-2480




2DH5-Ant7-2480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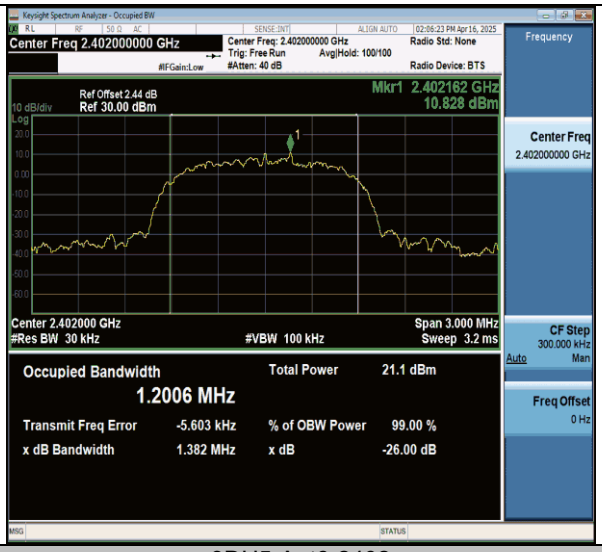
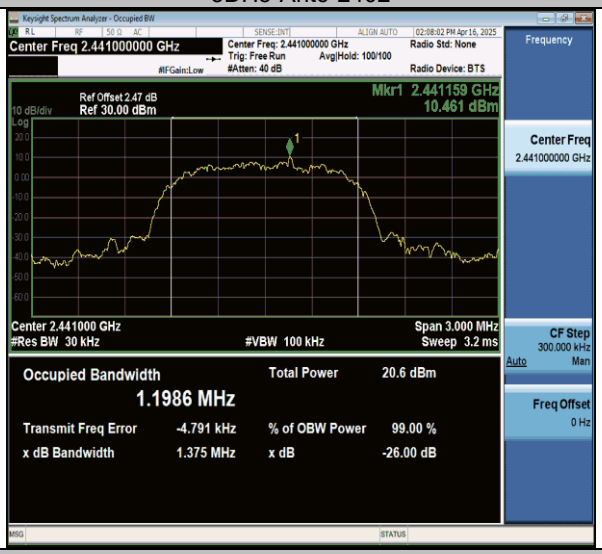
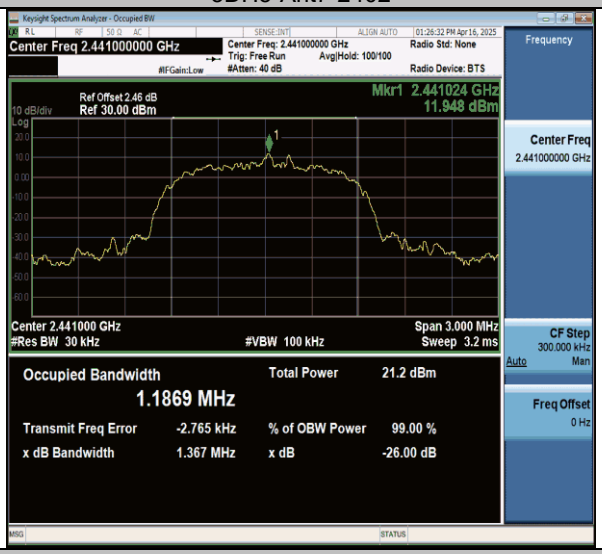



3DH5-Ant6-2402

3DH5-Ant7-2402

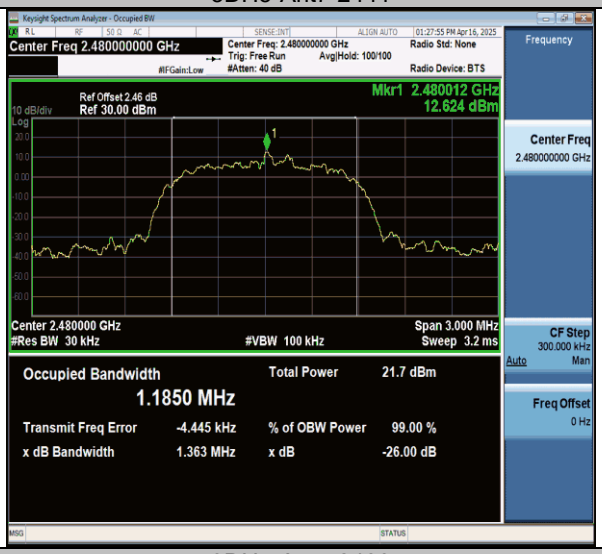



3DH5-Ant6-2441




3DH5-Ant7-2441

3DH5-Ant6-2480




3DH5-Ant7-2480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# Maximum conducted output power

## Test Result

| Test Mode | Test Channel | Average | | Peak | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | Ant6 (dBm) | Ant7 (dBm) | Ant6 (dBm) | Ant7 (dBm) | | |
| DH5 | 2402 | 13.286 | 12.496 | 13.877 | 13.194 | ≤30.00 | PASS |
| | 2441 | 12.458 | 12.493 | 13.037 | 13.176 | ≤30.00 | PASS |
| | 2480 | 12.734 | 11.965 | 13.216 | 12.632 | ≤30.00 | PASS |
| 2DH5 | 2402 | 13.783 | 12.965 | 16.616 | 15.770 | ≤20.97 | PASS |
| | 2441 | 12.961 | 12.922 | 15.864 | 15.753 | ≤20.97 | PASS |
| | 2480 | 13.168 | 12.395 | 15.951 | 15.188 | ≤20.97 | PASS |
| 3DH5 | 2402 | 13.761 | 12.976 | 16.868 | 16.081 | ≤20.97 | PASS |
| | 2441 | 12.957 | 12.937 | 16.114 | 16.046 | ≤20.97 | PASS |
| | 2480 | 13.129 | 12.364 | 16.183 | 15.409 | ≤20.97 | PASS |


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# Carrier frequency separation

## Test Result

| TestMode | Antenna | Hop/Non-Hop | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant7 | Hop | 0.826 | ≥0.632 | PASS |
| DH5 | Ant6 | Hop | 1.192 | ≥0.948 | PASS |
| 2DH5 | Ant6 | Hop | 1.004 | ≥0.876 | PASS |
| 2DH5 | Ant7 | Hop | 1.01 | ≥0.882 | PASS |
| 3DH5 | Ant6 | Hop | 0.984 | ≥0.872 | PASS |
| 3DH5 | Ant7 | Hop | 0.996 | ≥0.878 | PASS |


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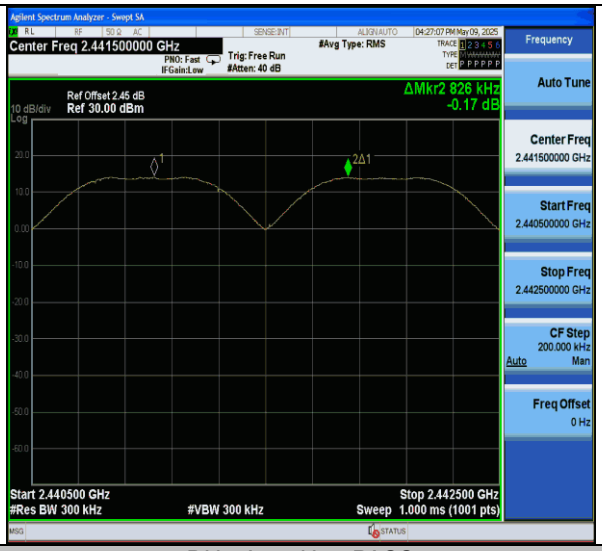
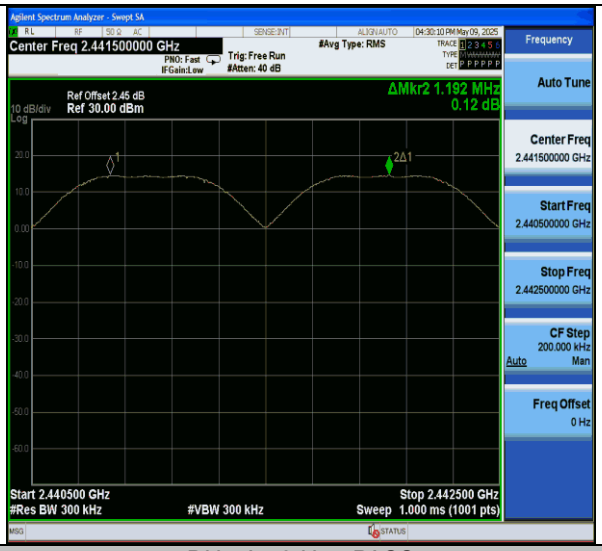
## Test Graphs



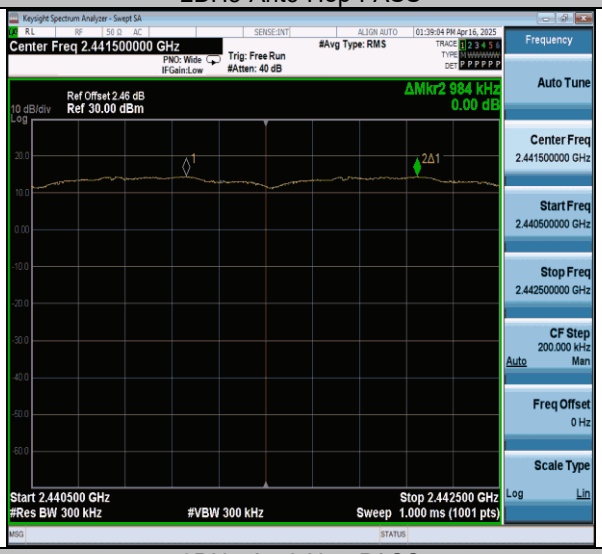

DH5-Ant7-Hop-PASS




DH5-Ant6-Hop-PASS

2DH5-Ant6-Hop-PASS

2DH5-Ant7-Hop-PASS




3DH5-Ant6-Hop-PASS

3DH5-Ant7-Hop-PASS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# Time of occupancy

## Test Result

| TestMode | Antenna | Hop/Non-Hop | BurstWidth [ms] | TotalHops [Num] | Result[s] | Limit[s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant7 | Hop | 2.885 | 106.67 | 0.308 | ≤0.4 | PASS |
| DH5 | Ant6 | Hop | 2.884 | 106.67 | 0.308 | ≤0.4 | PASS |
| 2DH5 | Ant6 | Hop | 2.885 | 106.67 | 0.308 | ≤0.4 | PASS |
| 2DH5 | Ant7 | Hop | 2.885 | 106.67 | 0.308 | ≤0.4 | PASS |
| 3DH5 | Ant6 | Hop | 2.888 | 106.67 | 0.308 | ≤0.4 | PASS |
| 3DH5 | Ant7 | Hop | 2.888 | 106.67 | 0.308 | ≤0.4 | PASS |


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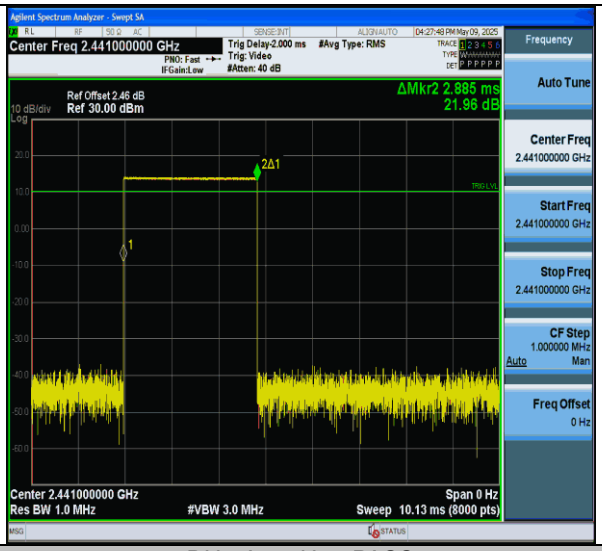
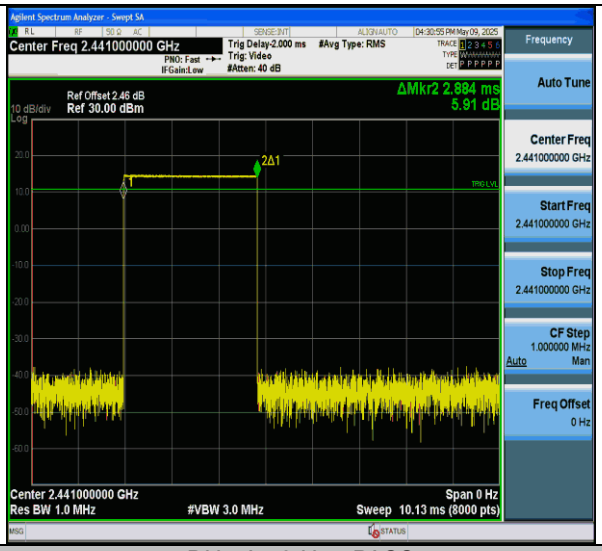
## Test Graphs



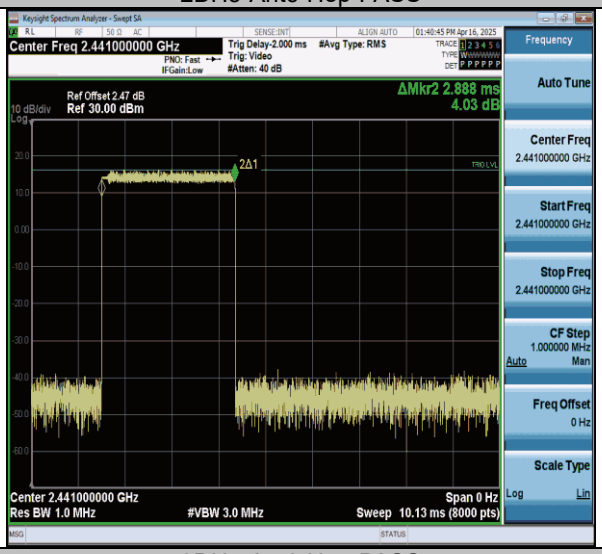

DH5-Ant7-Hop-PASS



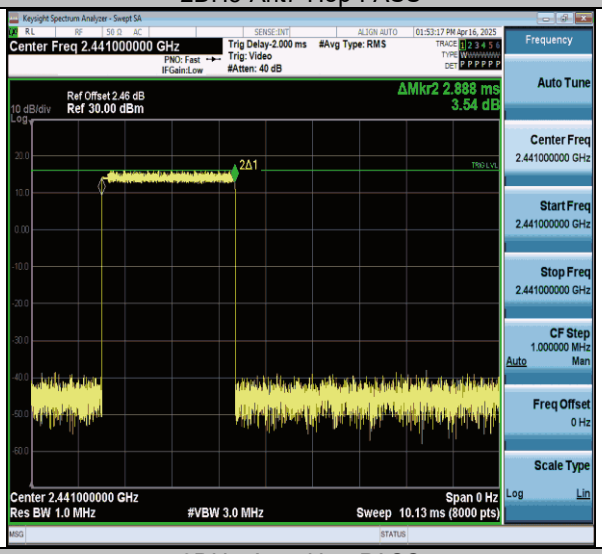

DH5-Ant6-Hop-PASS

2DH5-Ant6-Hop-PASS

2DH5-Ant7-Hop-PASS




3DH5-Ant6-Hop-PASS




3DH5-Ant7-Hop-PASS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# Number of hopping channels

## Test Result

| TestMode | Antenna | Hop/Non-Hop | Result[Num] | Limit[Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant7 | Hop | 79 | ≥15 | PASS |
| DH5 | Ant6 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant6 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant7 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant6 | Hop | 79 | ≥15 | PASS |
| 3DH5 | Ant7 | Hop | 79 | ≥15 | PASS |


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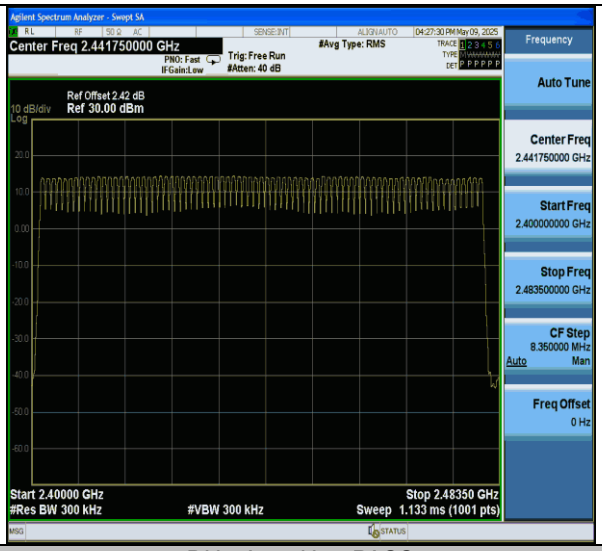
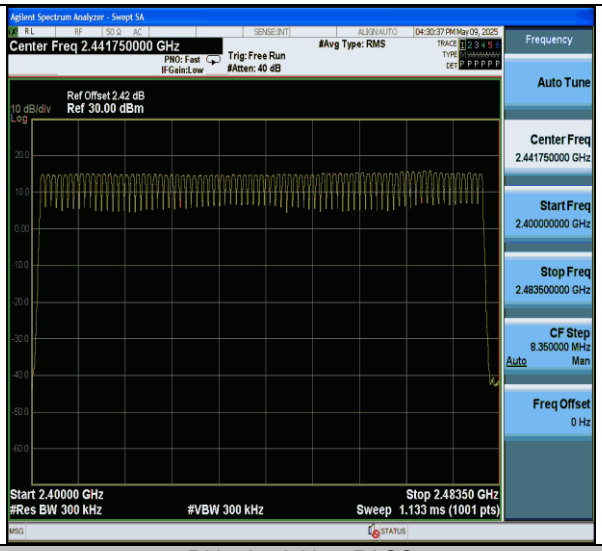
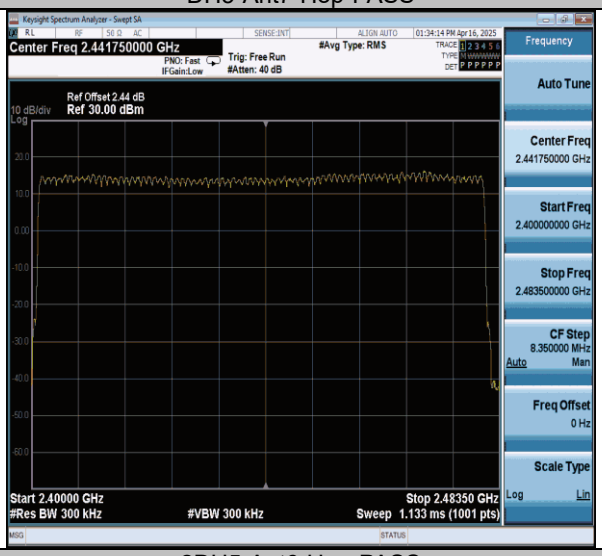
## Test Graphs



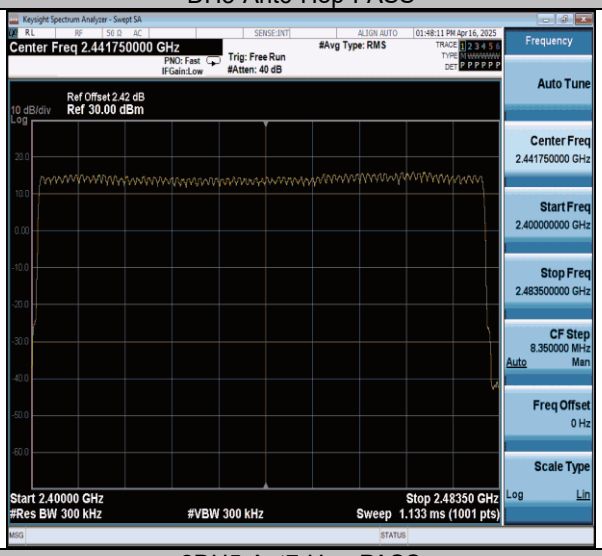

DH5-Ant7-Hop-PASS



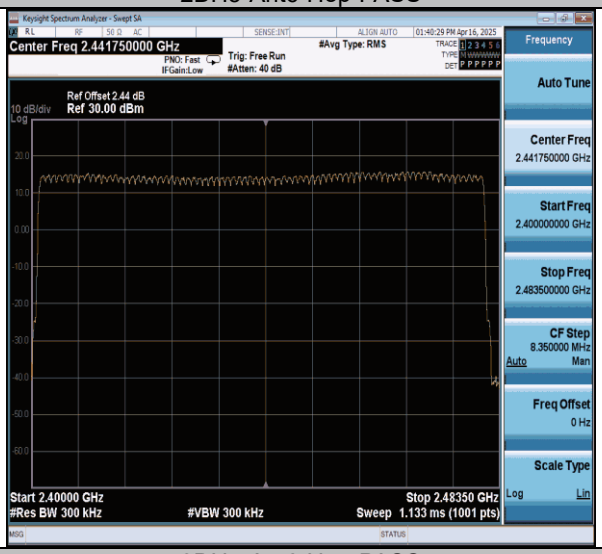

DH5-Ant6-Hop-PASS




2DH5-Ant6-Hop-PASS




2DH5-Ant7-Hop-PASS

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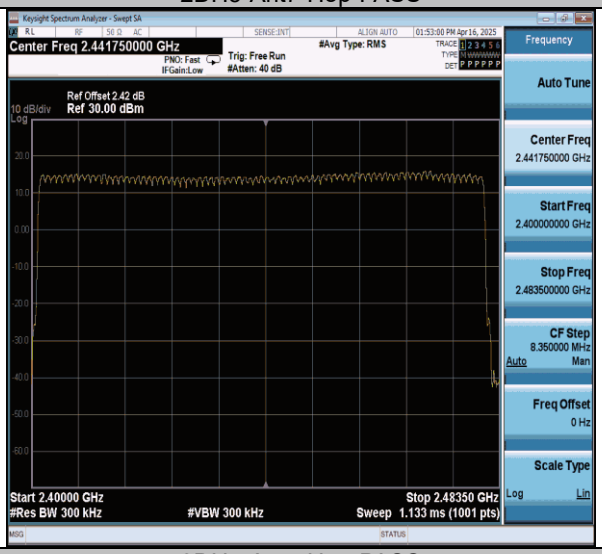


3DH5-Ant7-Hop-PASS


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# Band edge measurements

## Test Result

| TestMode | Antenna | ChName | Frequency[MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant6 | Low | 2402 | 14.40 | -45.82 | ≤-5.6 | PASS |
| DH5 | Ant7 | Low | 2402 | 13.48 | -46.26 | ≤-6.52 | PASS |
| DH5 | Ant7 | High | 2480 | 13.92 | -54.11 | ≤-6.08 | PASS |
| DH5 | Ant6 | High | 2480 | 13.90 | -53.84 | ≤-6.1 | PASS |
| DH5 | Ant6 | Low | Hop_2402 | 14.09 | -49.35 | ≤-5.91 | PASS |
| DH5 | Ant7 | Low | Hop_2402 | 13.10 | -47.9 | ≤-6.9 | PASS |
| DH5 | Ant6 | High | Hop_2480 | 14.86 | -55.3 | ≤-5.14 | PASS |
| DH5 | Ant7 | High | Hop_2480 | 13.18 | -47.78 | ≤-6.82 | PASS |
| 2DH5 | Ant7 | Low | 2402 | 14.71 | -46.55 | ≤-5.29 | PASS |
| 2DH5 | Ant6 | Low | 2402 | 14.63 | -46.03 | ≤-5.37 | PASS |
| 2DH5 | Ant7 | High | 2480 | 14.65 | -49.8 | ≤-5.35 | PASS |
| 2DH5 | Ant6 | High | 2480 | 14.55 | -49.95 | ≤-5.45 | PASS |
| 2DH5 | Ant6 | Low | Hop_2402 | 12.54 | -49.94 | ≤-7.46 | PASS |
| 2DH5 | Ant7 | Low | Hop_2402 | 11.73 | -50.44 | ≤-8.27 | PASS |
| 2DH5 | Ant6 | High | Hop_2480 | 13.48 | -54.83 | ≤-6.52 | PASS |
| 2DH5 | Ant7 | High | Hop_2480 | 15.55 | -51.38 | ≤-4.45 | PASS |
| 3DH5 | Ant7 | Low | 2402 | 14.75 | -46.2 | ≤-5.25 | PASS |
| 3DH5 | Ant6 | Low | 2402 | 14.62 | -46.71 | ≤-5.38 | PASS |
| 3DH5 | Ant7 | High | 2480 | 14.63 | -49.21 | ≤-5.37 | PASS |
| 3DH5 | Ant6 | High | 2480 | 14.53 | -49.94 | ≤-5.47 | PASS |
| 3DH5 | Ant6 | Low | Hop_2402 | 12.61 | -50.89 | ≤-7.39 | PASS |
| 3DH5 | Ant7 | Low | Hop_2402 | 11.90 | -49.65 | ≤-8.1 | PASS |
| 3DH5 | Ant6 | High | Hop_2480 | 14.13 | -52.13 | ≤-5.87 | PASS |
| 3DH5 | Ant7 | High | Hop_2480 | 12.67 | -51.47 | ≤-7.33 | PASS |


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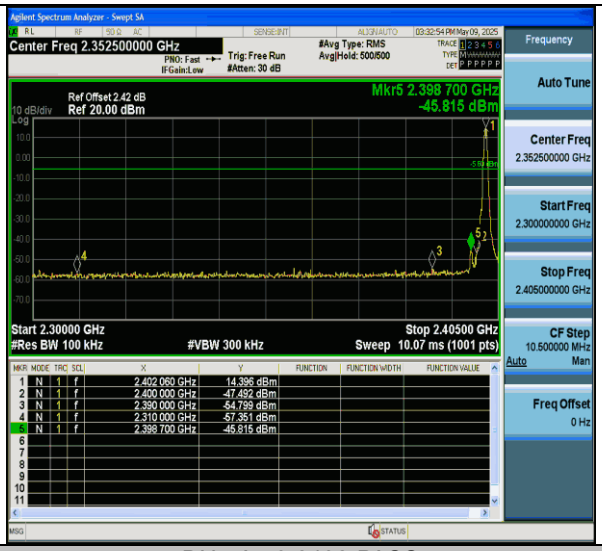
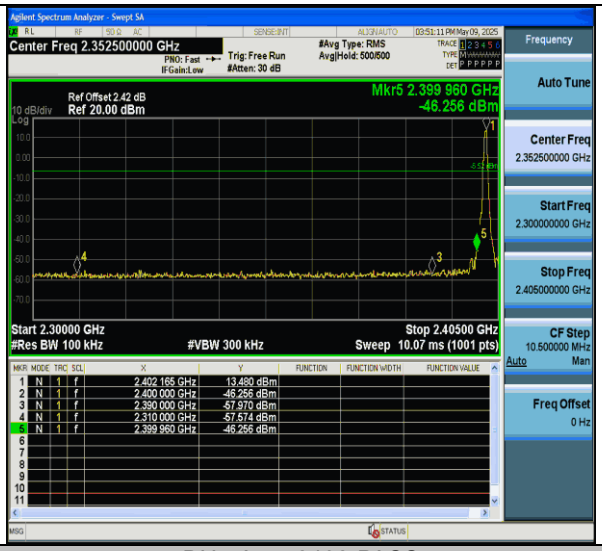
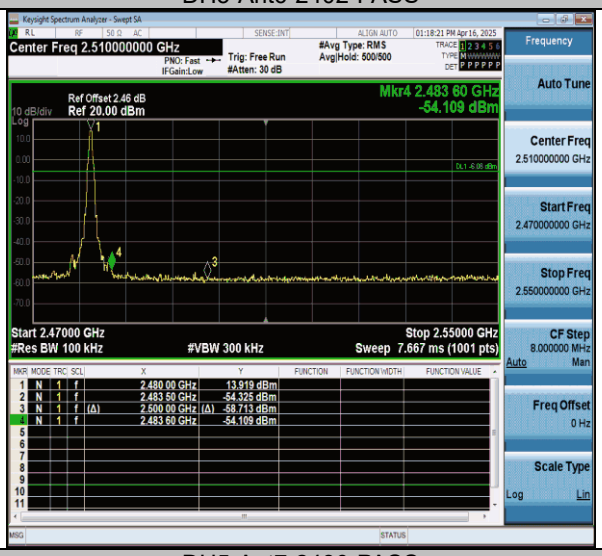
## Test Graphs




DH5-Ant6-2402-PASS

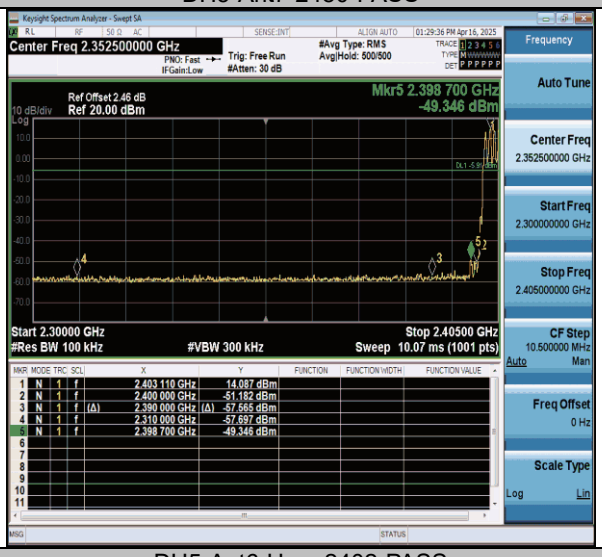



DH5-Ant7-2402-PASS

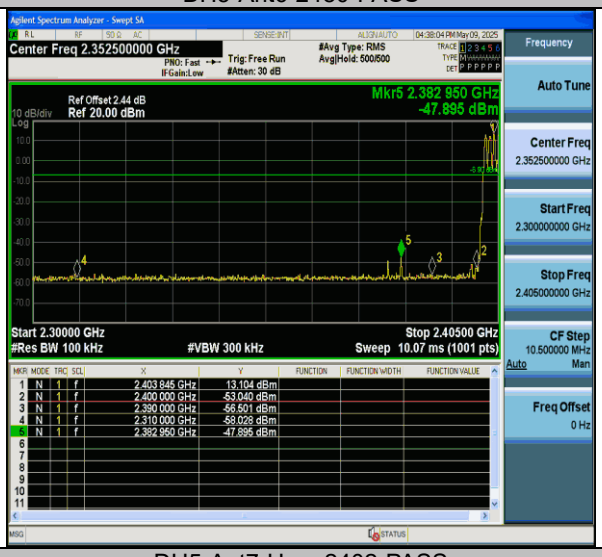



DH5-Ant7-2480-PASS

DH5-Ant6-2480-PASS




DH5-Ant6-Hop_2402-PASS




DH5-Ant7-Hop_2402-PASS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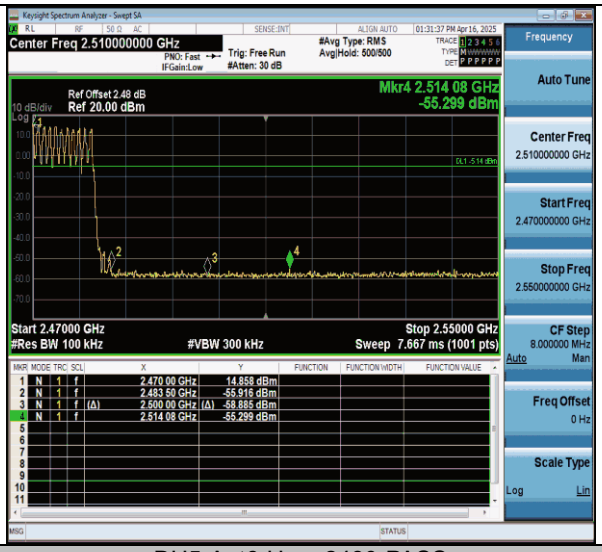
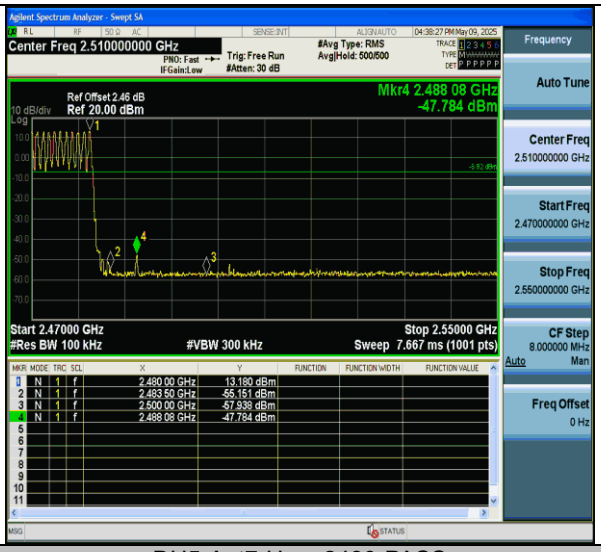
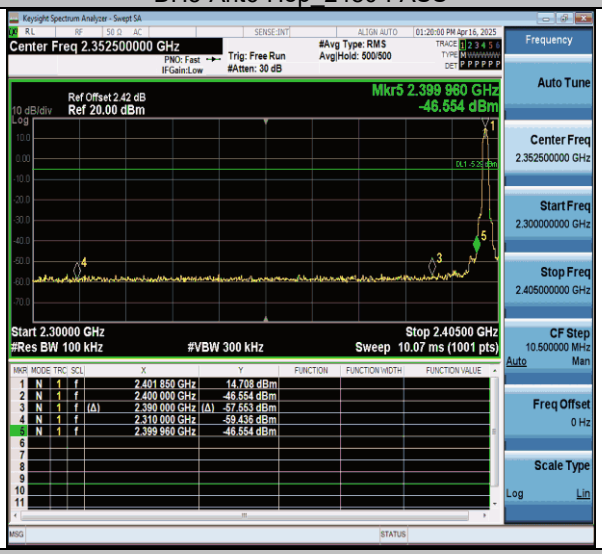


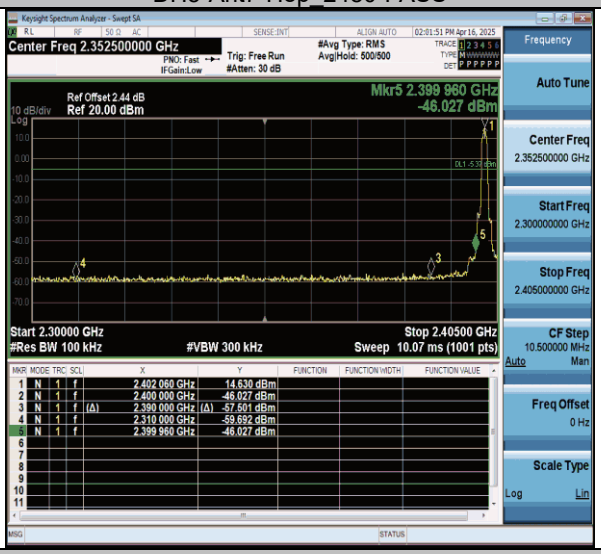

DH5-Ant6-Hop_2480-PASS



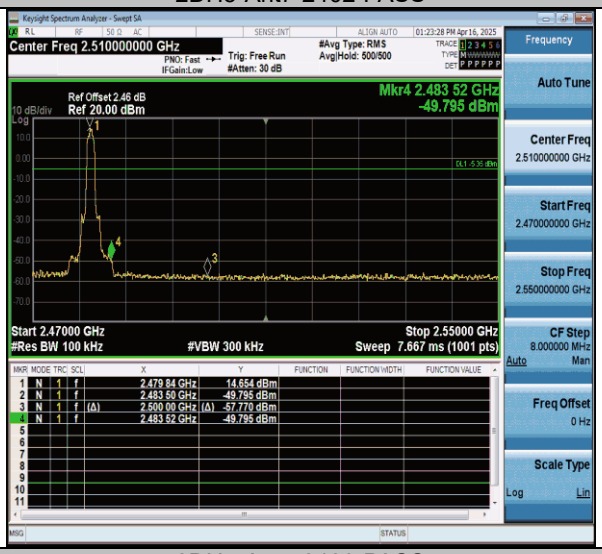

DH5-Ant7-Hop_2480-PASS



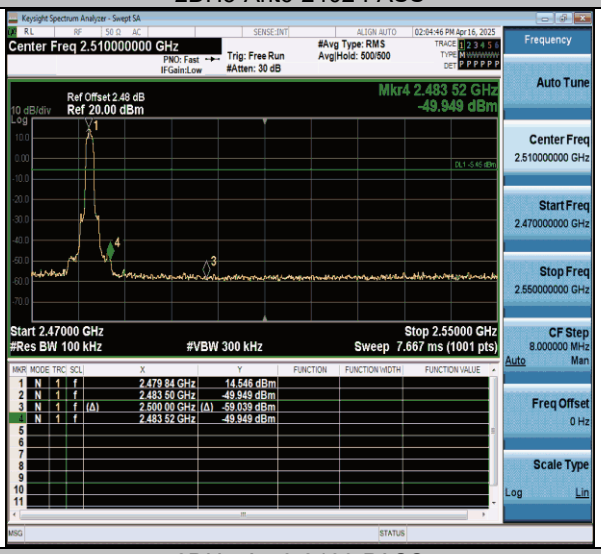

2DH5-Ant7-2402-PASS




2DH5-Ant6-2402-PASS




2DH5-Ant7-2480-PASS




2DH5-Ant6-2480-PASS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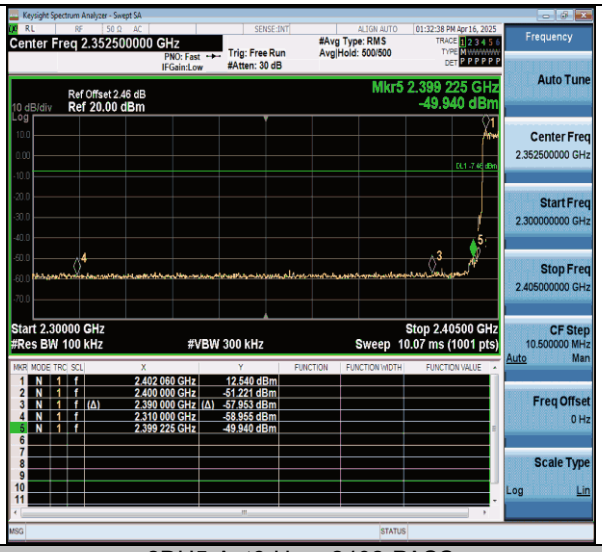
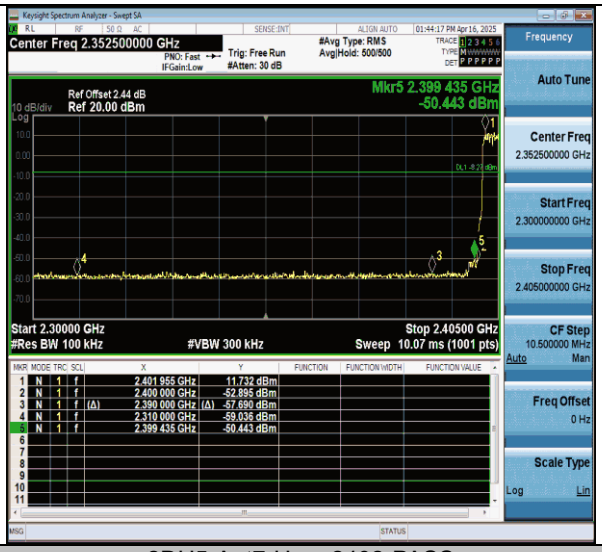
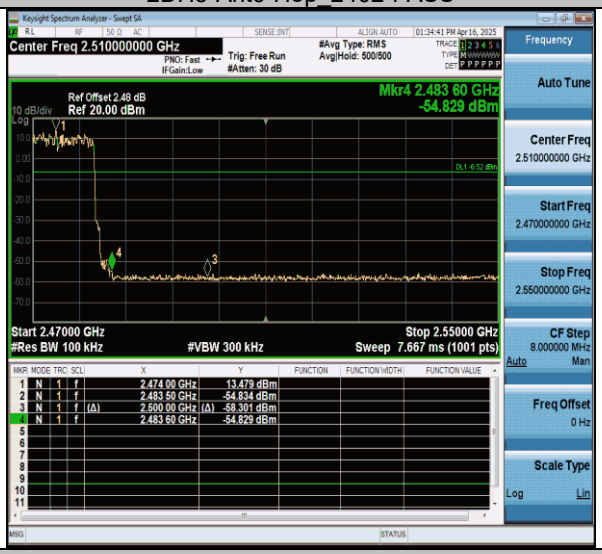


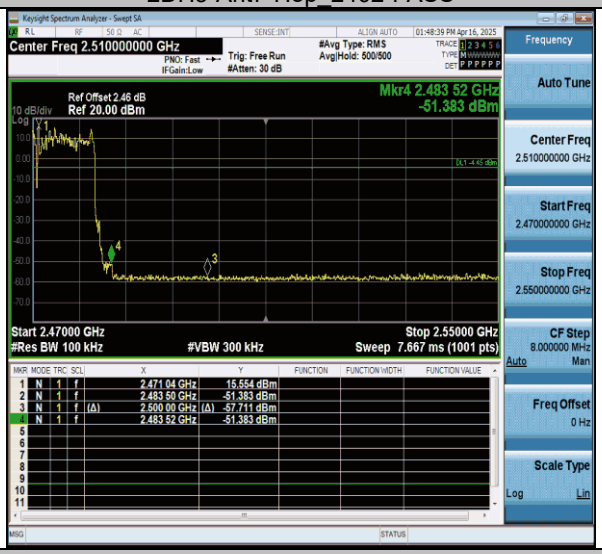

2DH5-Ant6-Hop_2402-PASS



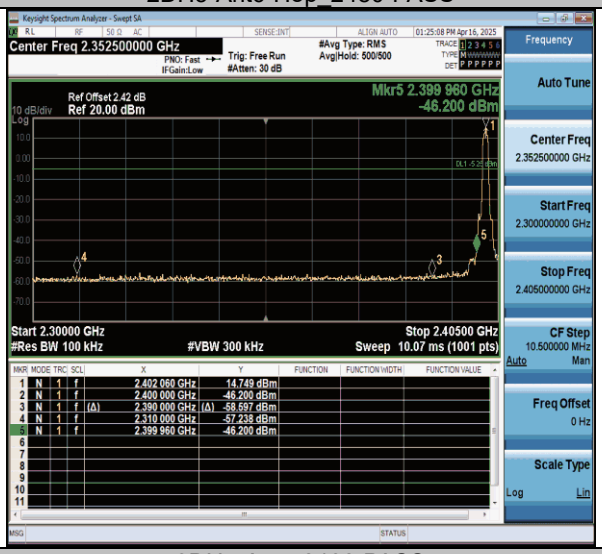

2DH5-Ant7-Hop_2402-PASS



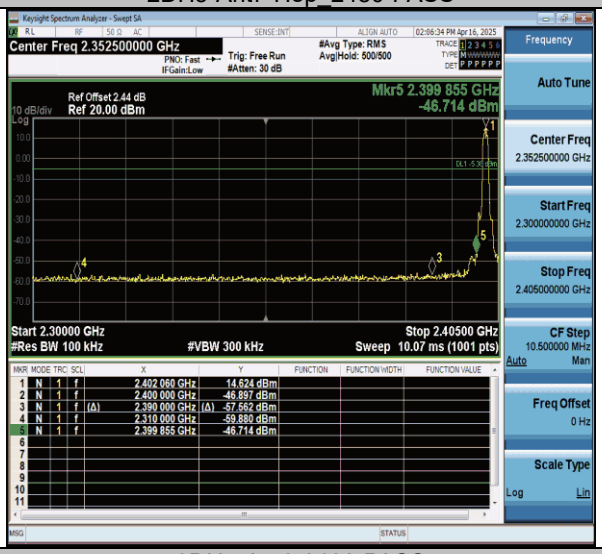

2DH5-Ant6-Hop_2480-PASS




2DH5-Ant7-Hop_2480-PASS




3DH5-Ant7-2402-PASS




3DH5-Ant6-2402-PASS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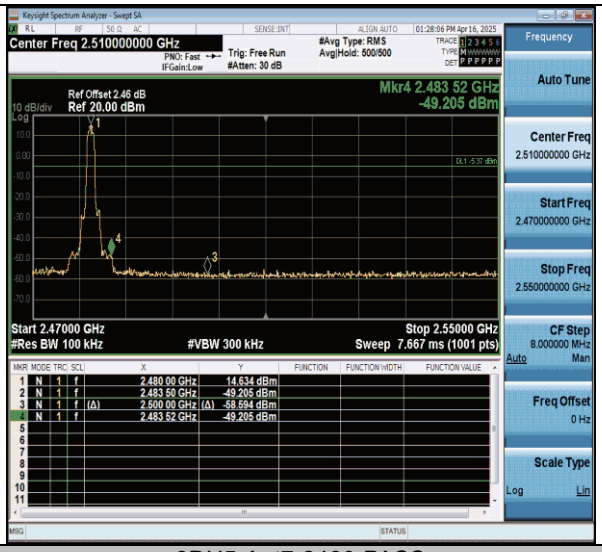
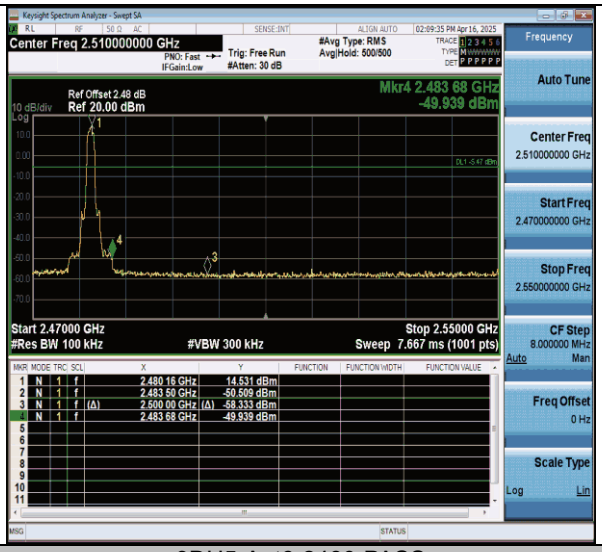
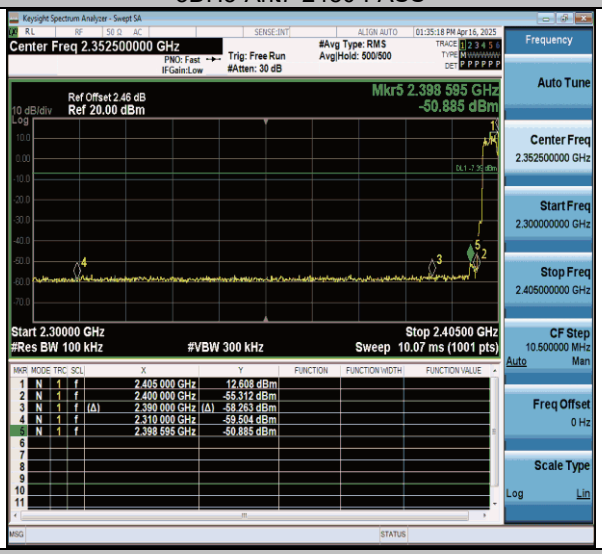


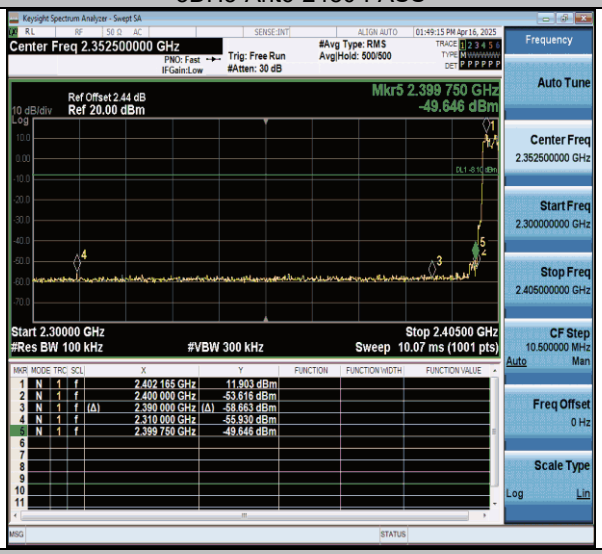

3DH5-Ant7-2480-PASS




3DH5-Ant6-2480-PASS




3DH5-Ant6-Hop_2402-PASS

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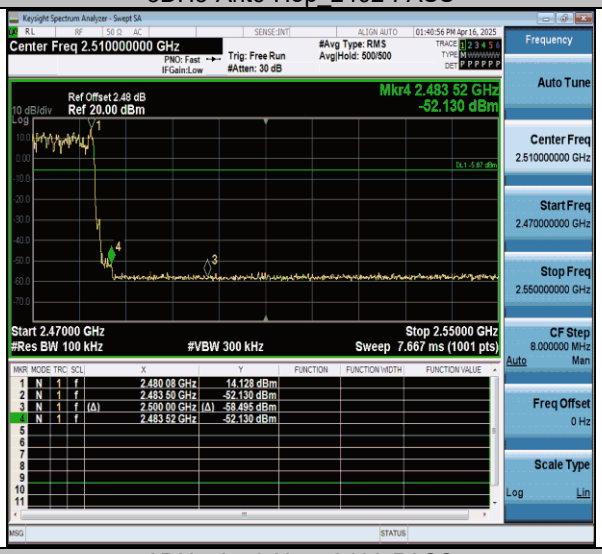
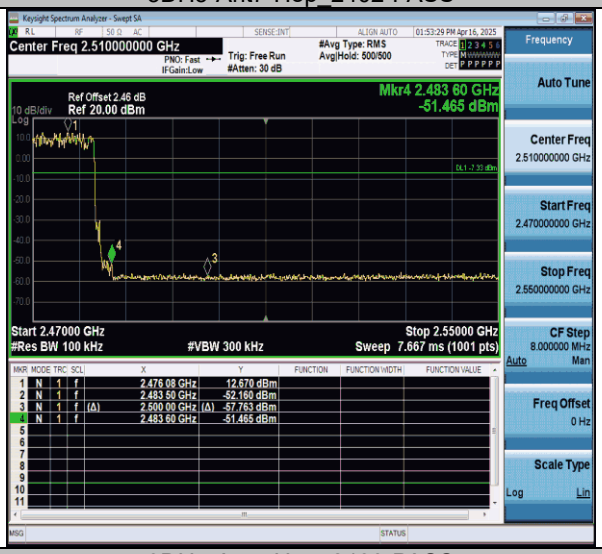



3DH5-Ant6-Hop_2480-PASS




3DH5-Ant7-Hop_2480-PASS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# Conducted Spurious Emission

## Test Result

| TestMode | Antenna | Frequency[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant6 | 2402 | 0~Reference | 14.49 | 14.49 | --- | PASS |
| DH5 | Ant7 | 2402 | 0~Reference | 12.83 | 12.83 | --- | PASS |
| DH5 | Ant6 | 2402 | 30~1000 | 14.49 | -61.15 | ≤-5.51 | PASS |
| DH5 | Ant7 | 2402 | 30~1000 | 12.83 | -60.86 | ≤-7.17 | PASS |
| DH5 | Ant6 | 2402 | 1000~26500 | 14.49 | -46.22 | ≤-5.51 | PASS |
| DH5 | Ant7 | 2402 | 1000~26500 | 12.83 | -46.85 | ≤-7.17 | PASS |
| DH5 | Ant6 | 2441 | 0~Reference | 13.05 | 13.05 | --- | PASS |
| DH5 | Ant7 | 2441 | 0~Reference | 13.01 | 13.01 | --- | PASS |
| DH5 | Ant6 | 2441 | 30~1000 | 13.05 | -62.39 | ≤-6.95 | PASS |
| DH5 | Ant7 | 2441 | 30~1000 | 13.01 | -62.26 | ≤-6.99 | PASS |
| DH5 | Ant6 | 2441 | 1000~26500 | 13.05 | -45.8 | ≤-6.95 | PASS |
| DH5 | Ant7 | 2441 | 1000~26500 | 13.01 | -45.19 | ≤-6.99 | PASS |
| DH5 | Ant6 | 2480 | 0~Reference | 13.45 | 13.45 | --- | PASS |
| DH5 | Ant7 | 2480 | 0~Reference | 13.68 | 13.68 | --- | PASS |
| DH5 | Ant6 | 2480 | 30~1000 | 13.45 | -62.51 | ≤-6.55 | PASS |
| DH5 | Ant7 | 2480 | 30~1000 | 13.68 | -62.67 | ≤-6.32 | PASS |
| DH5 | Ant6 | 2480 | 1000~26500 | 13.45 | -44.65 | ≤-6.55 | PASS |
| DH5 | Ant7 | 2480 | 1000~26500 | 13.68 | -45.56 | ≤-6.32 | PASS |
| 2DH5 | Ant6 | 2402 | 0~Reference | 13.95 | 13.95 | --- | PASS |
| 2DH5 | Ant7 | 2402 | 0~Reference | 14.54 | 14.54 | --- | PASS |
| 2DH5 | Ant6 | 2402 | 30~1000 | 13.95 | -62.63 | ≤-6.05 | PASS |
| 2DH5 | Ant7 | 2402 | 30~1000 | 14.54 | -62.43 | ≤-5.46 | PASS |
| 2DH5 | Ant6 | 2402 | 1000~26500 | 13.95 | -44.37 | ≤-6.05 | PASS |
| 2DH5 | Ant7 | 2402 | 1000~26500 | 14.54 | -45.86 | ≤-5.46 | PASS |
| 2DH5 | Ant6 | 2441 | 0~Reference | 14.05 | 14.05 | --- | PASS |
| 2DH5 | Ant7 | 2441 | 0~Reference | 14.05 | 14.05 | --- | PASS |
| 2DH5 | Ant6 | 2441 | 30~1000 | 14.05 | -62.74 | ≤-5.95 | PASS |
| 2DH5 | Ant7 | 2441 | 30~1000 | 14.05 | -62.5 | ≤-5.95 | PASS |
| 2DH5 | Ant6 | 2441 | 1000~26500 | 14.05 | -44.47 | ≤-5.95 | PASS |
| 2DH5 | Ant7 | 2441 | 1000~26500 | 14.05 | -45.11 | ≤-5.95 | PASS |
| 2DH5 | Ant6 | 2480 | 0~Reference | 14.35 | 14.35 | --- | PASS |
| 2DH5 | Ant7 | 2480 | 0~Reference | 12.88 | 12.88 | --- | PASS |
| 2DH5 | Ant6 | 2480 | 30~1000 | 14.35 | -62.66 | ≤-5.65 | PASS |
| 2DH5 | Ant7 | 2480 | 30~1000 | 12.88 | -62.29 | ≤-7.12 | PASS |
| 2DH5 | Ant6 | 2480 | 1000~26500 | 14.35 | -45.25 | ≤-5.65 | PASS |
| 2DH5 | Ant7 | 2480 | 1000~26500 | 12.88 | -45.54 | ≤-7.12 | PASS |
| 3DH5 | Ant6 | 2402 | 0~Reference | 12.46 | 12.46 | --- | PASS |
| 3DH5 | Ant7 | 2402 | 0~Reference | 12.58 | 12.58 | --- | PASS |
| 3DH5 | Ant6 | 2402 | 30~1000 | 12.46 | -62.9 | ≤-7.54 | PASS |
| 3DH5 | Ant7 | 2402 | 30~1000 | 12.58 | -62.41 | ≤-7.42 | PASS |
| 3DH5 | Ant6 | 2402 | 1000~26500 | 12.46 | -45.33 | ≤-7.54 | PASS |
| 3DH5 | Ant7 | 2402 | 1000~26500 | 12.58 | -45.91 | ≤-7.42 | PASS |
| 3DH5 | Ant6 | 2441 | 0~Reference | 11.65 | 11.65 | --- | PASS |
| 3DH5 | Ant7 | 2441 | 0~Reference | 13.69 | 13.69 | --- | PASS |
| 3DH5 | Ant6 | 2441 | 30~1000 | 11.65 | -61.86 | ≤-8.35 | PASS |
| 3DH5 | Ant7 | 2441 | 30~1000 | 13.69 | -62.71 | ≤-6.31 | PASS |
| 3DH5 | Ant6 | 2441 | 1000~26500 | 11.65 | -45.62 | ≤-8.35 | PASS |
| 3DH5 | Ant7 | 2441 | 1000~26500 | 13.69 | -44.83 | ≤-6.31 | PASS |
| 3DH5 | Ant6 | 2480 | 0~Reference | 13.38 | 13.38 | --- | PASS |
| 3DH5 | Ant7 | 2480 | 0~Reference | 13.75 | 13.75 | --- | PASS |
| 3DH5 | Ant6 | 2480 | 30~1000 | 13.38 | -61.03 | ≤-6.62 | PASS |
| 3DH5 | Ant7 | 2480 | 30~1000 | 13.75 | -62.66 | ≤-6.25 | PASS |
| 3DH5 | Ant6 | 2480 | 1000~26500 | 13.38 | -45.48 | ≤-6.62 | PASS |
| 3DH5 | Ant7 | 2480 | 1000~26500 | 13.75 | -45.97 | ≤-6.25 | PASS |


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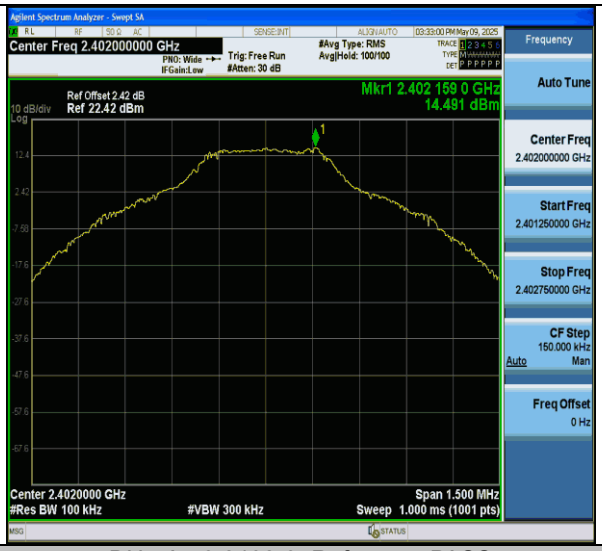
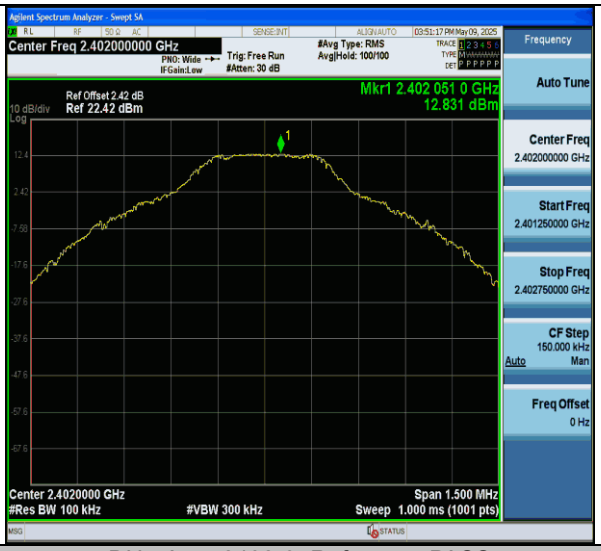
## Test Graphs




DH5-Ant6-2402-0~Reference-PASS

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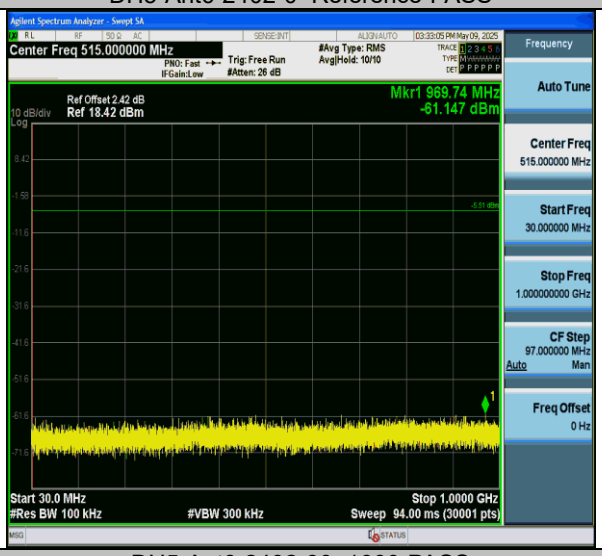
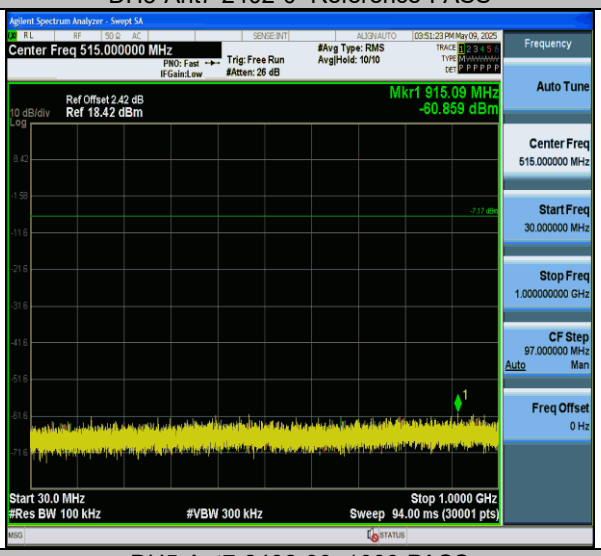
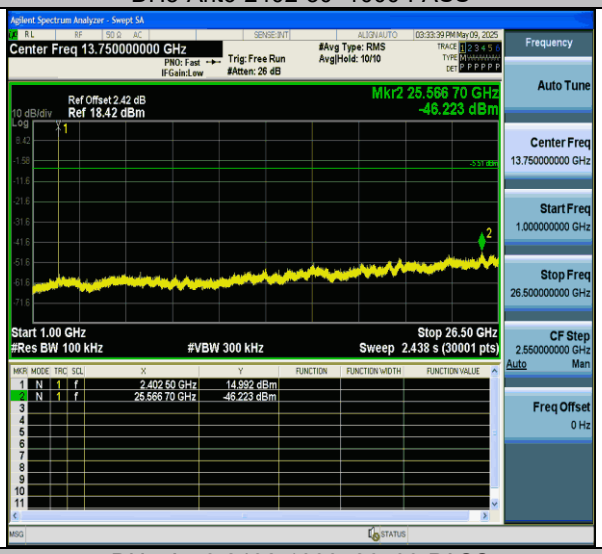



DH5-Ant6-2402-30~1000-PASS




DH5-Ant7-2402-30~1000-PASS

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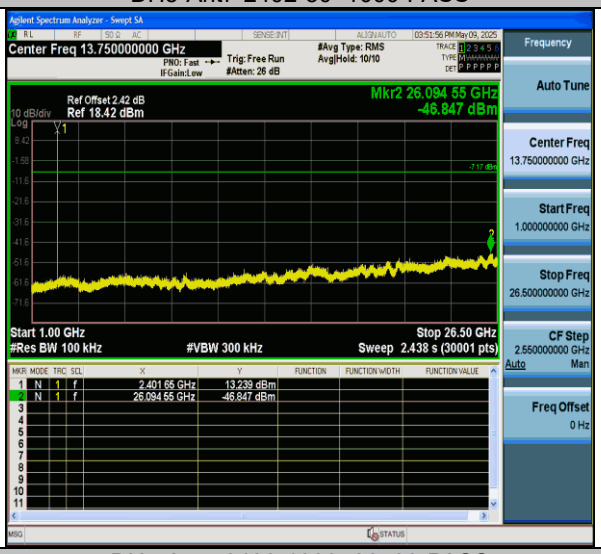


DH5-Ant7-2402-1000~26500-PASS


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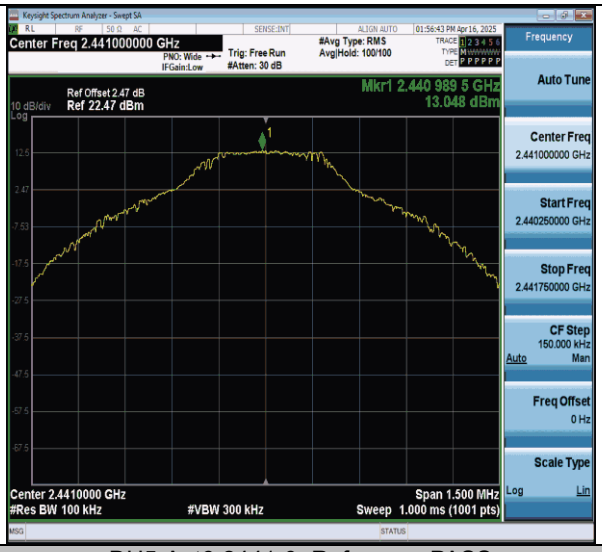


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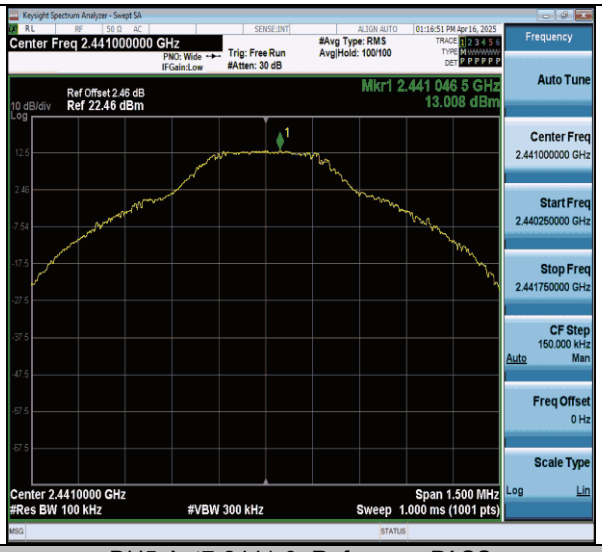


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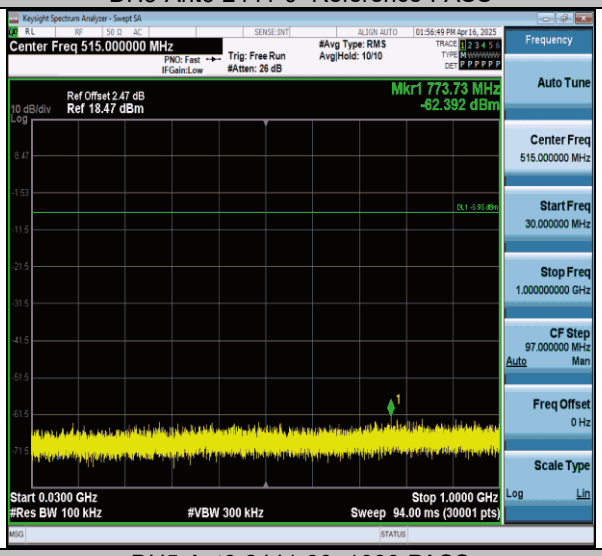


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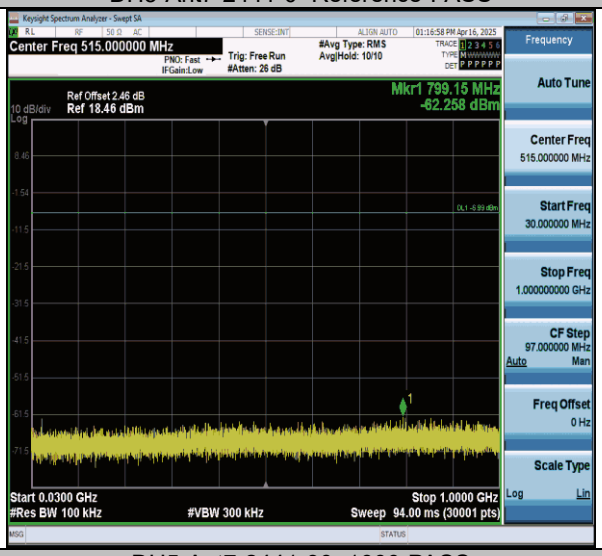


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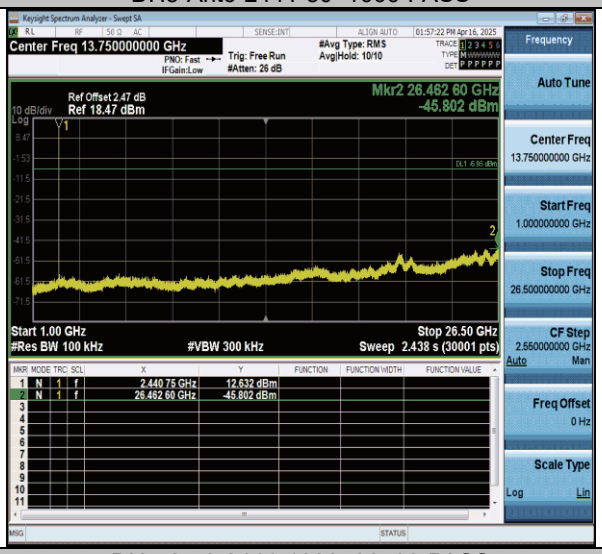


DH5-Ant6-2441-1000~26500-PASS

DH5-Ant7-2441-1000~26500-PASS


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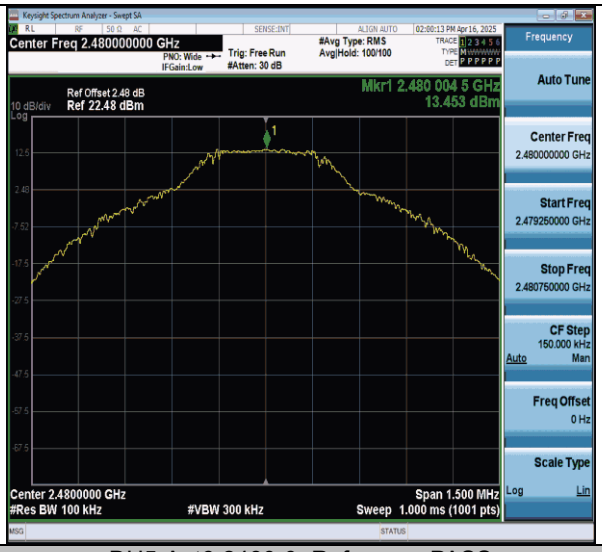


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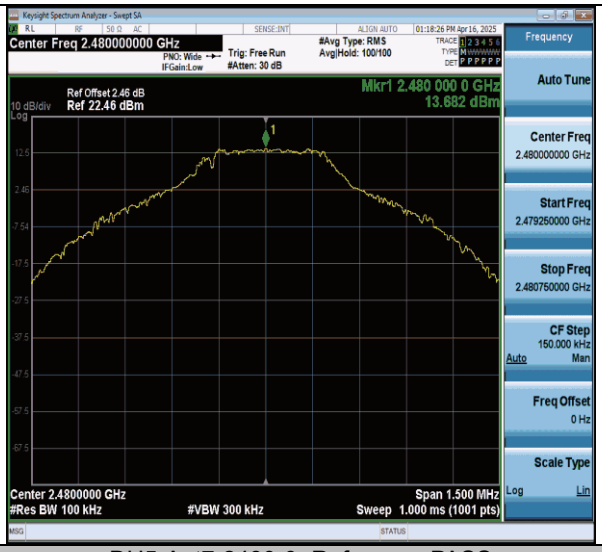


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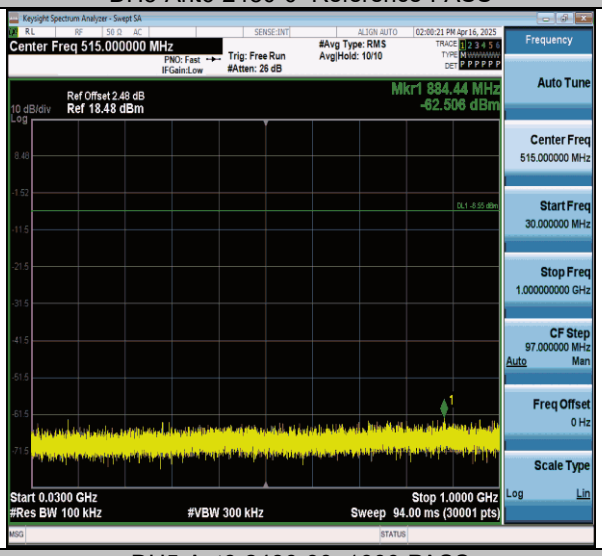


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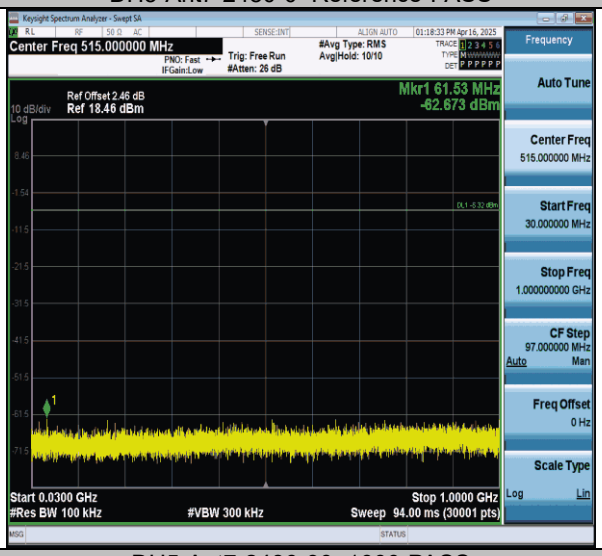


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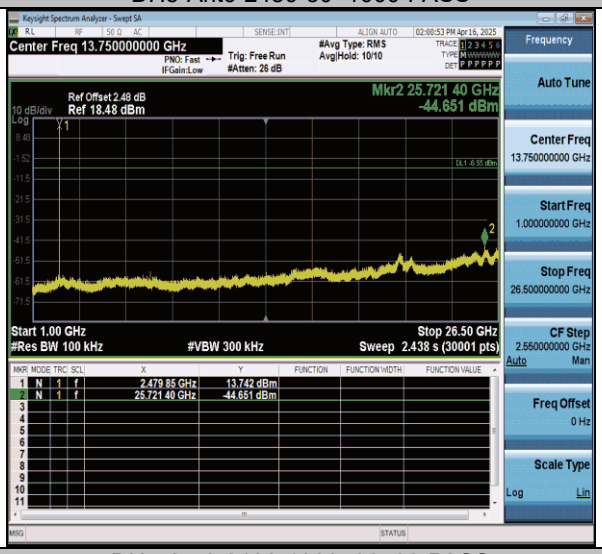
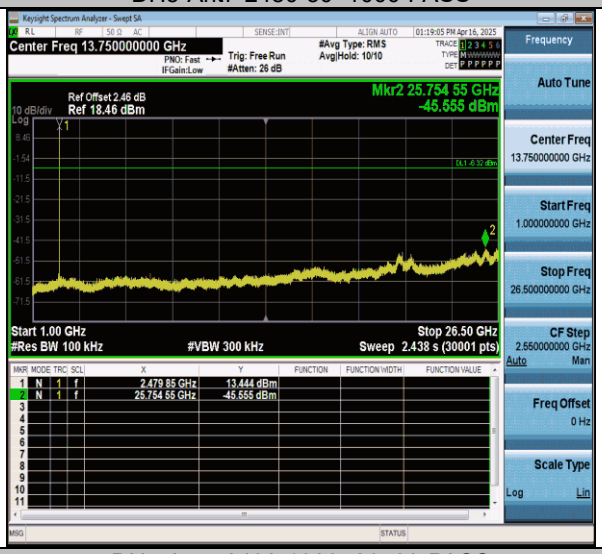



DH5-Ant6-2480-1000~26500-PASS




DH5-Ant7-2480-1000~26500-PASS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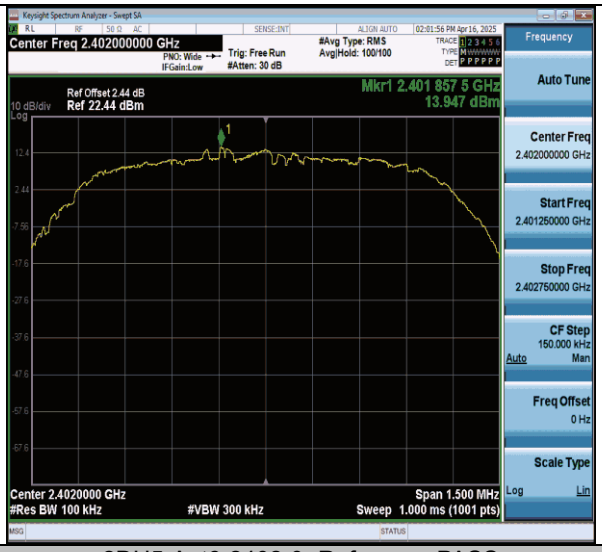


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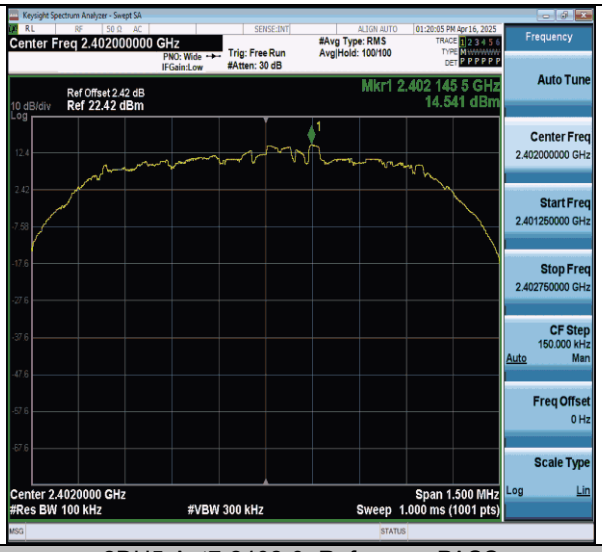


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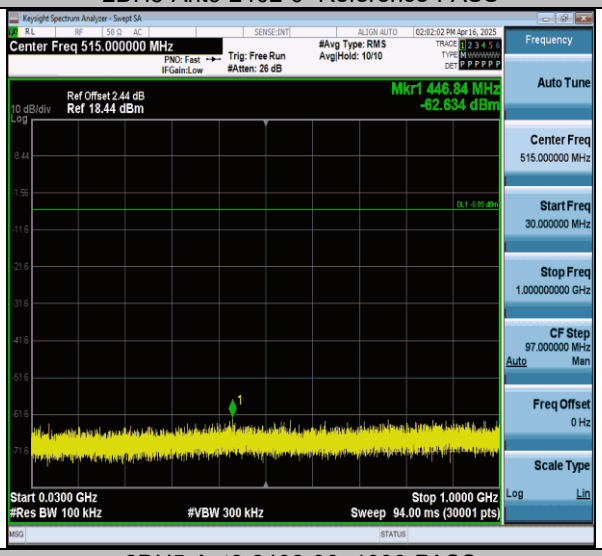
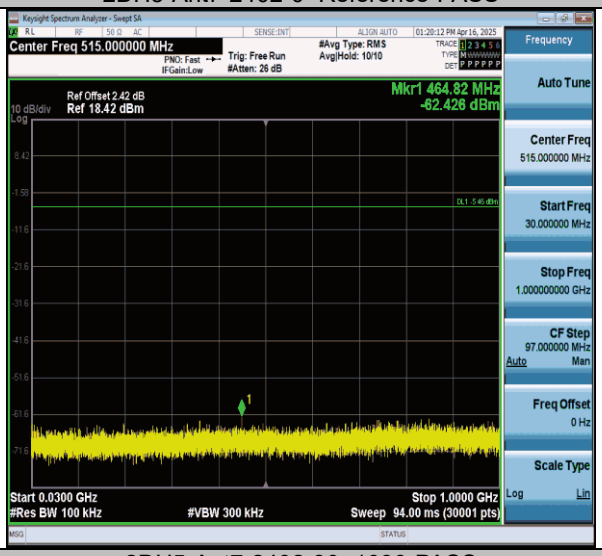



2DH5-Ant6-2402-30~1000-PASS

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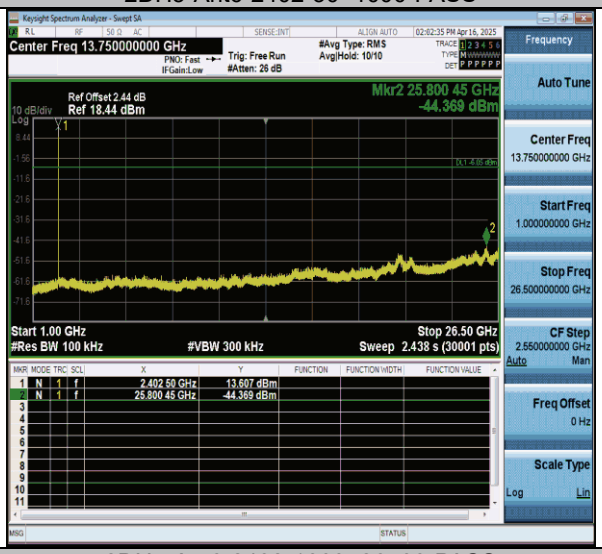
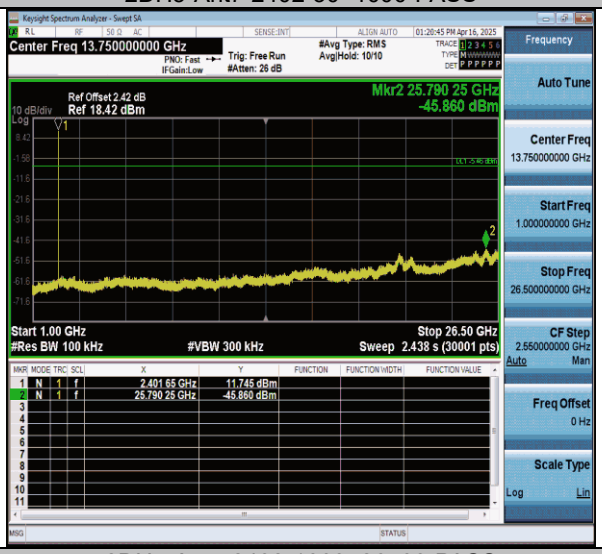



2DH5-Ant6-2402-1000~26500-PASS




2DH5-Ant7-2402-1000~26500-PASS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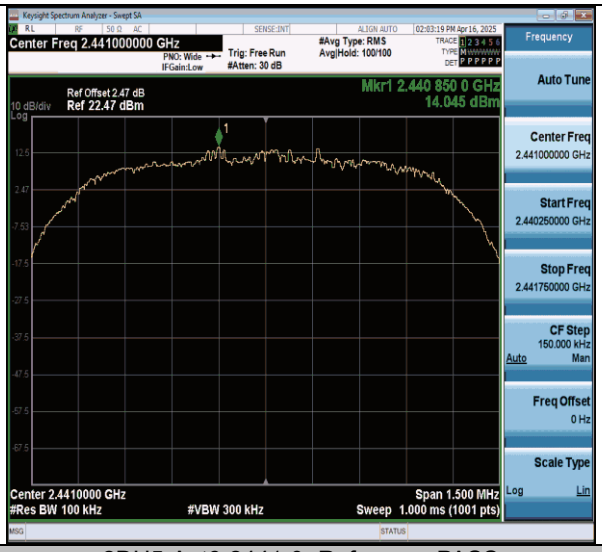


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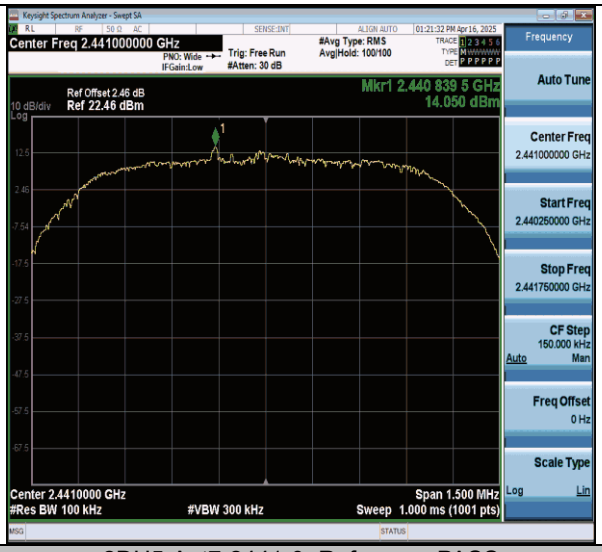


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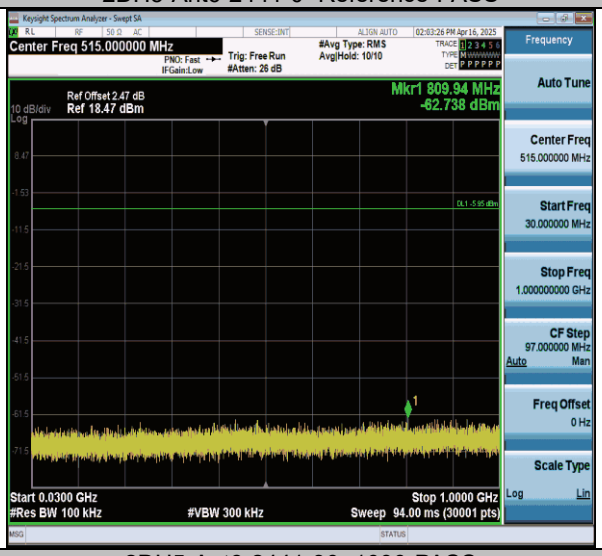
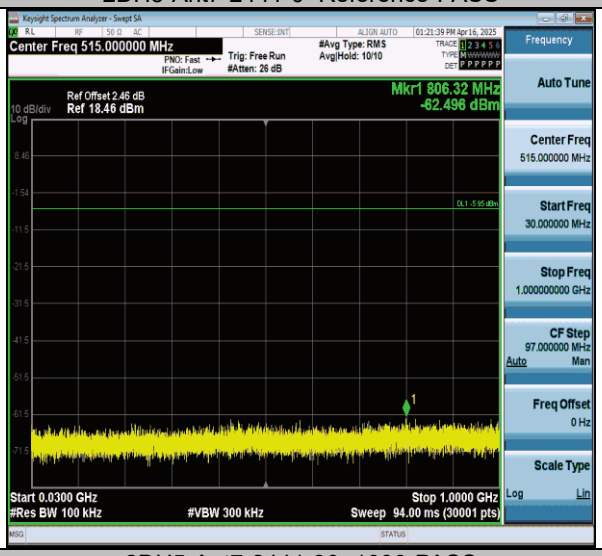



2DH5-Ant6-2441-30~1000-PASS

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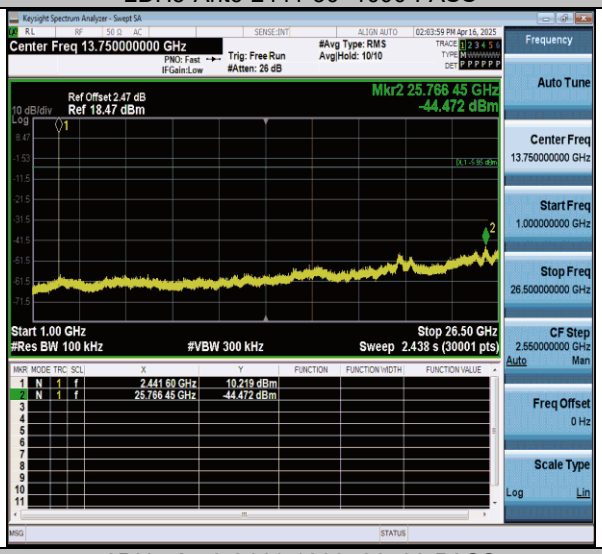
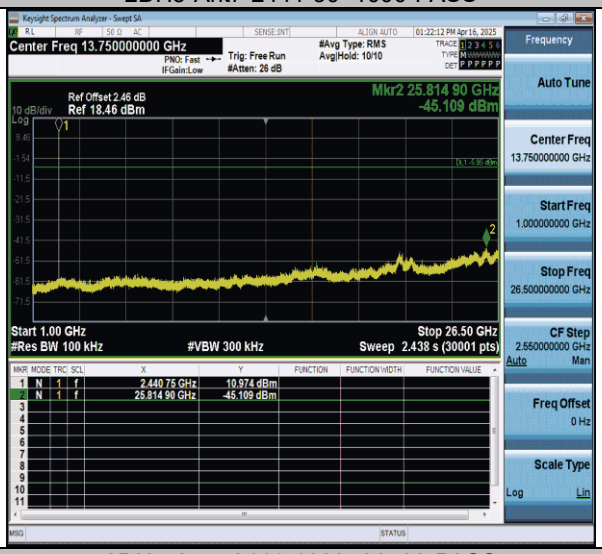



2DH5-Ant6-2441-1000~26500-PASS




2DH5-Ant7-2441-1000~26500-PASS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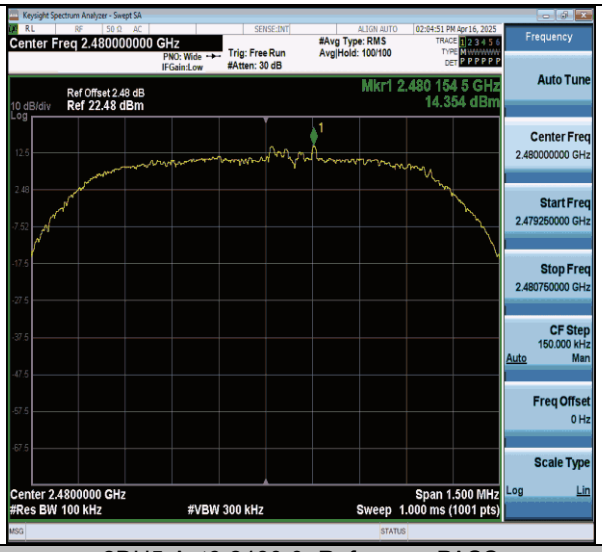


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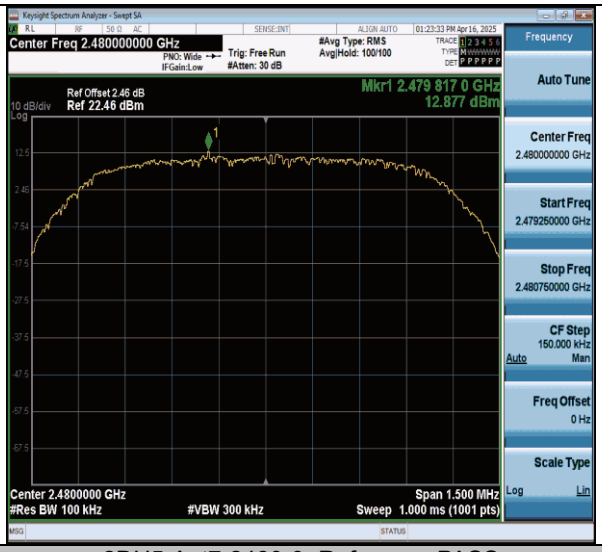
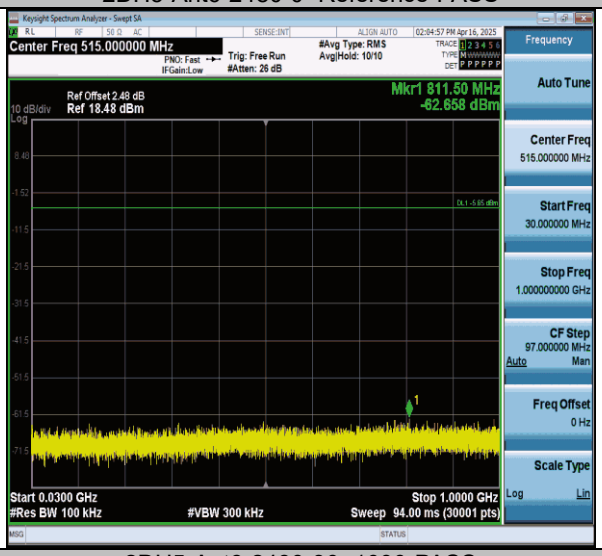



2DH5-Ant7-2480-0~Reference-PASS

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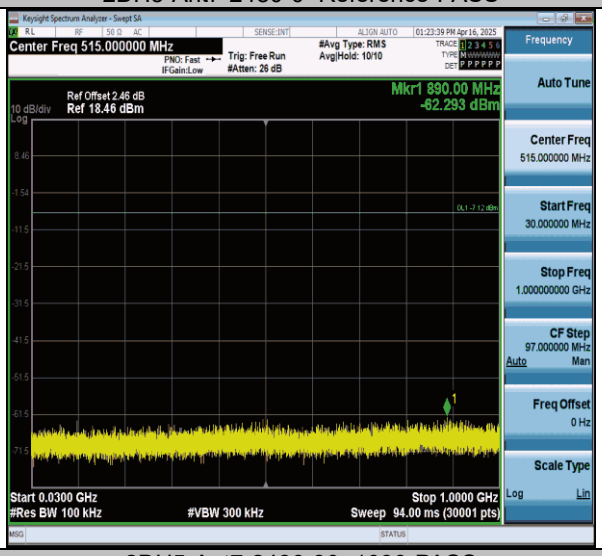


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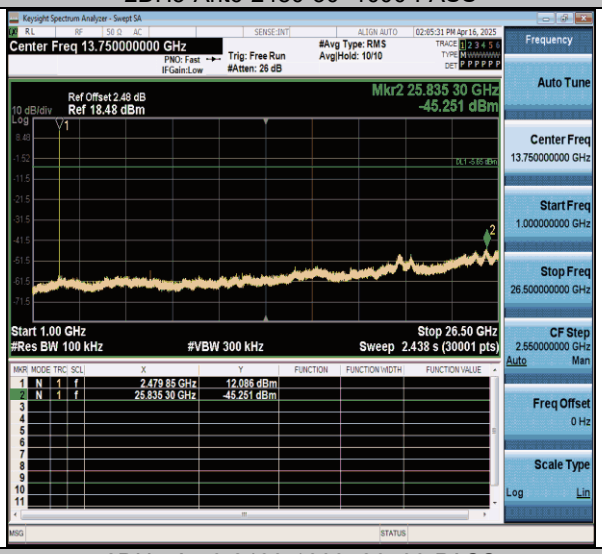


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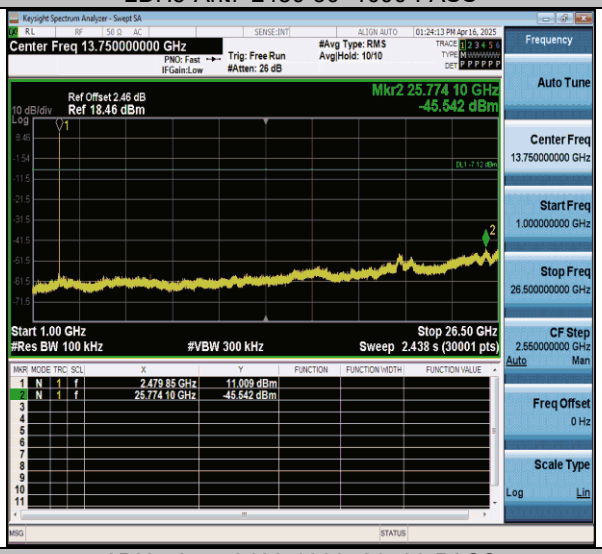


2DH5-Ant7-2480-1000~26500-PASS


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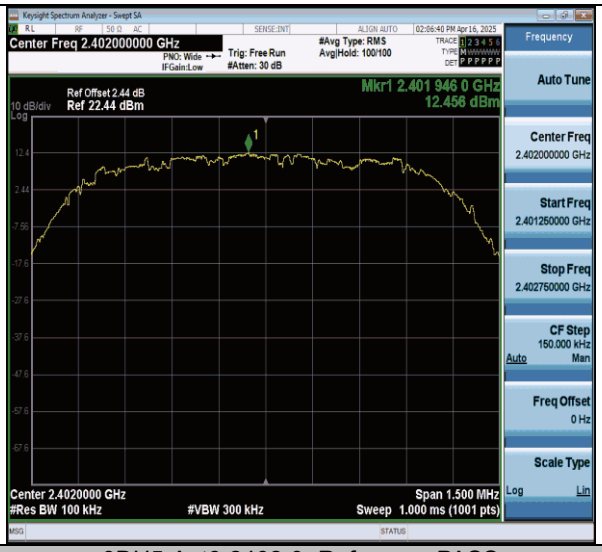


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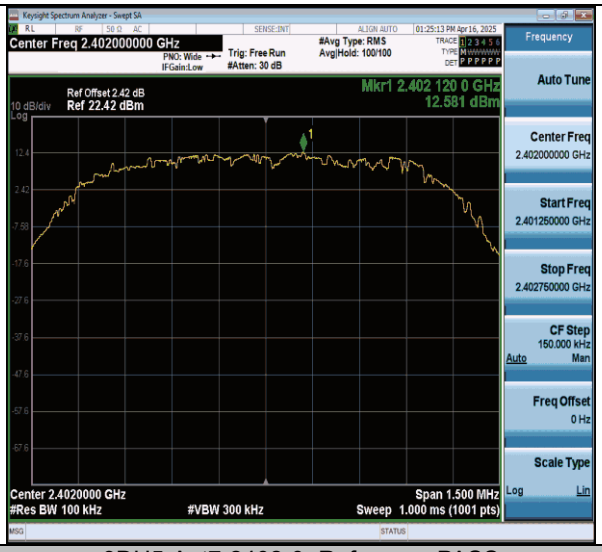


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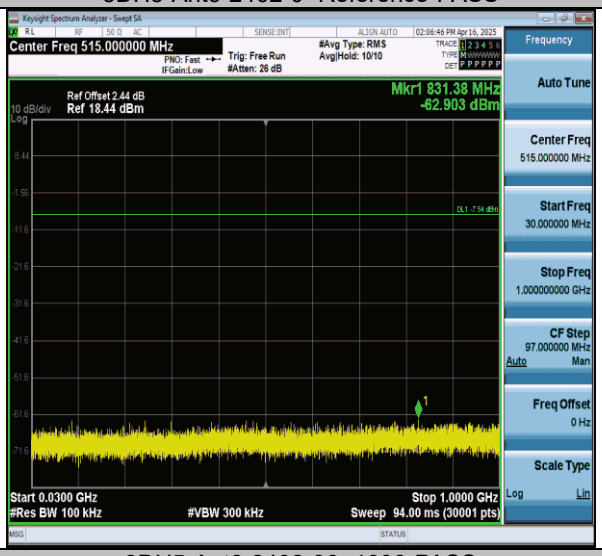


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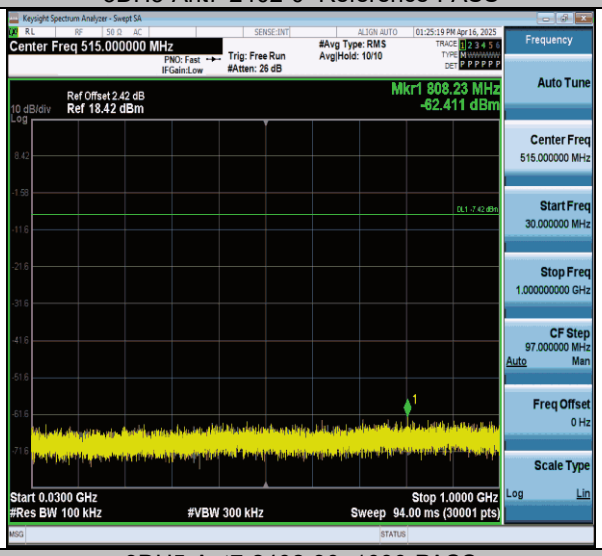


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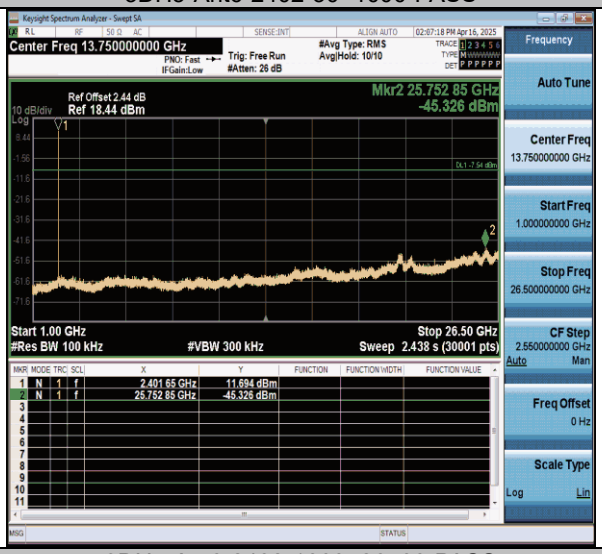


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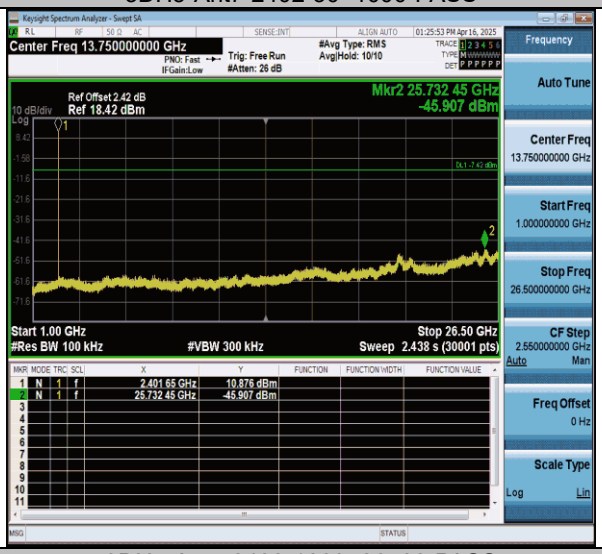


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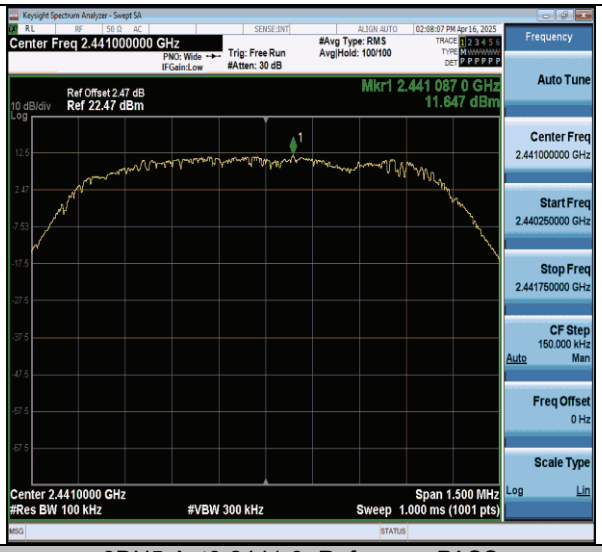


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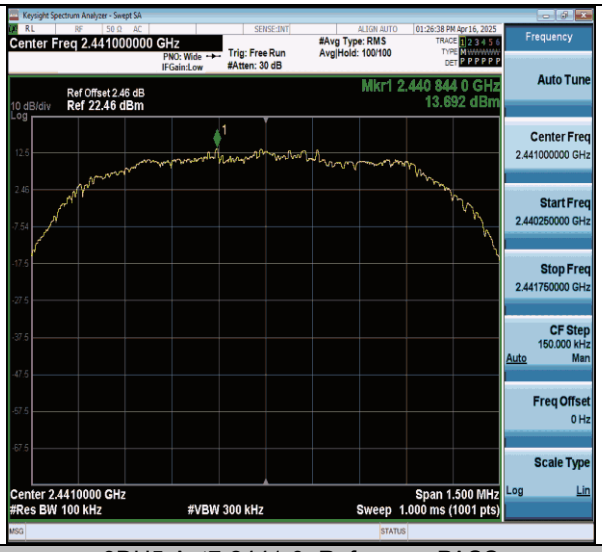


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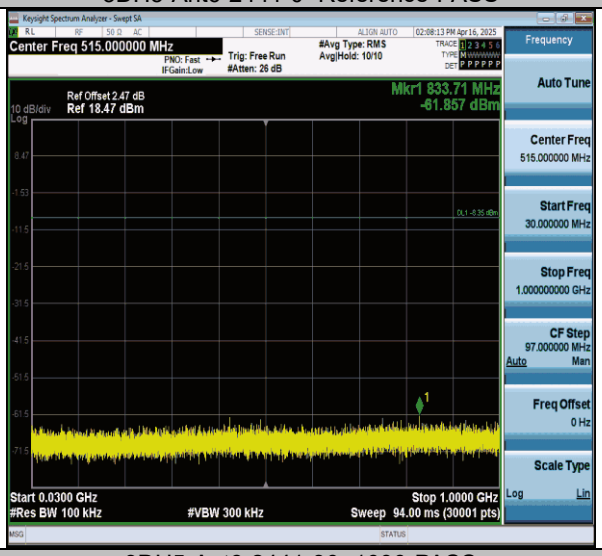


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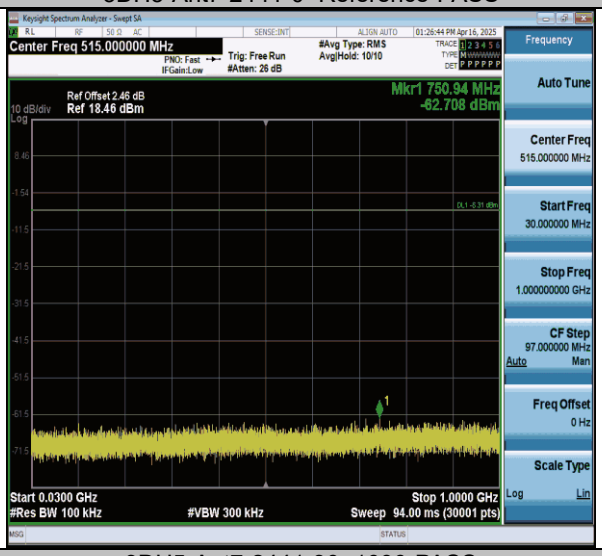


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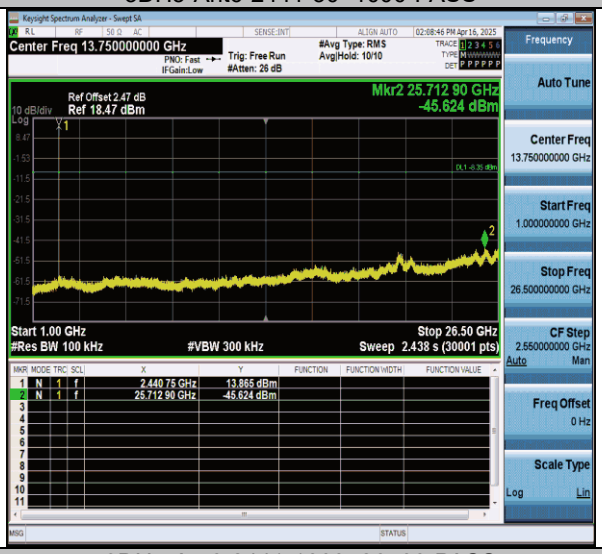


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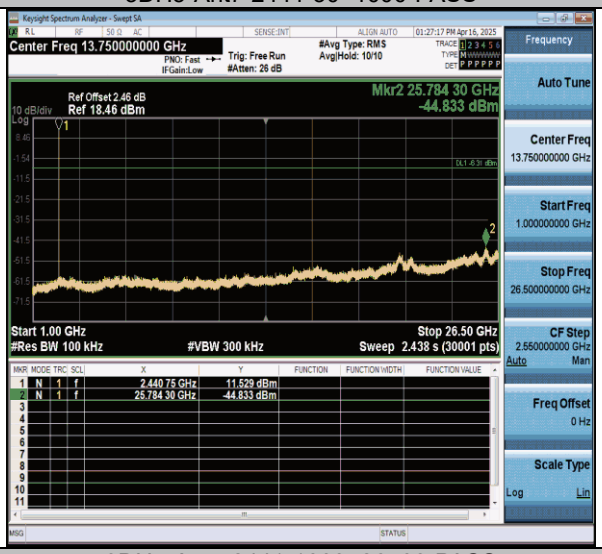


3DH5-Ant7-2441-1000~26500-PASS


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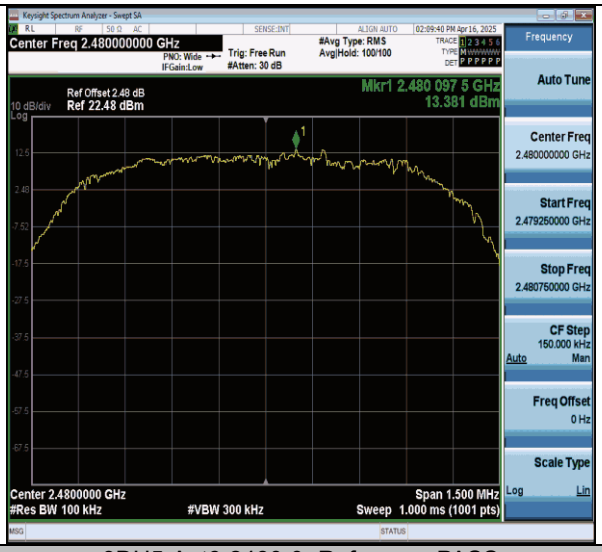


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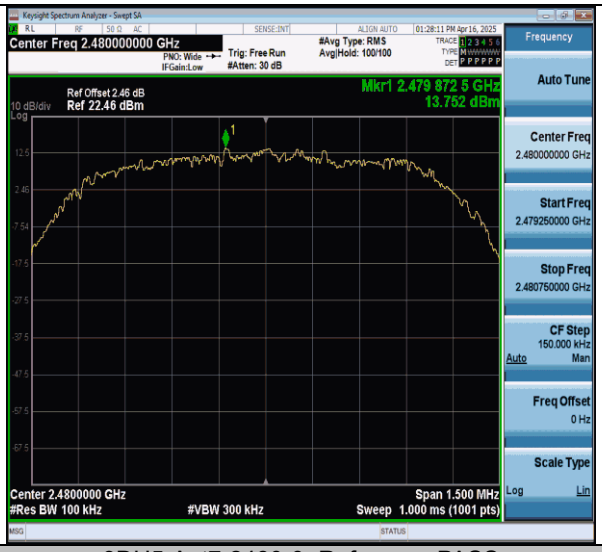


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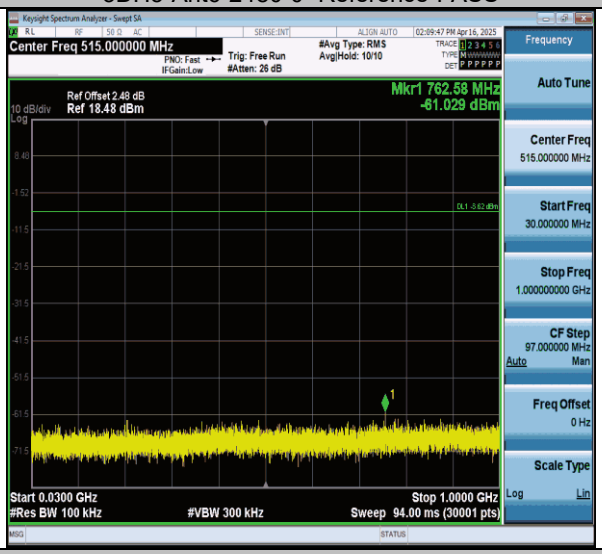


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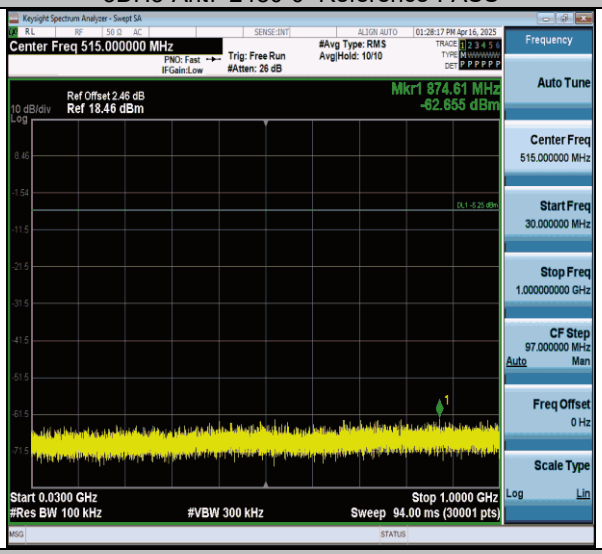


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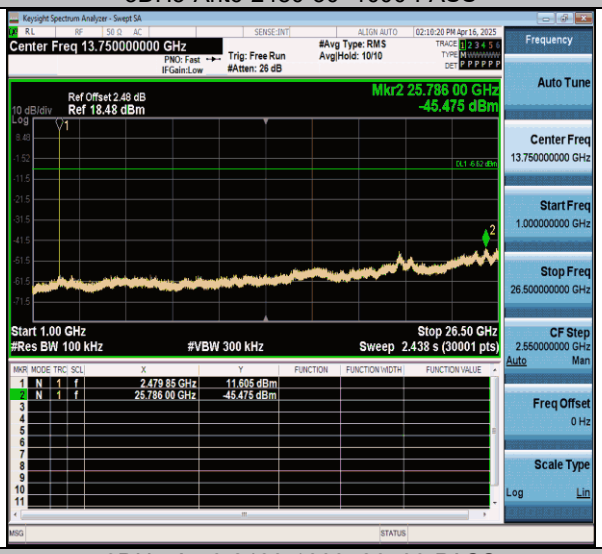


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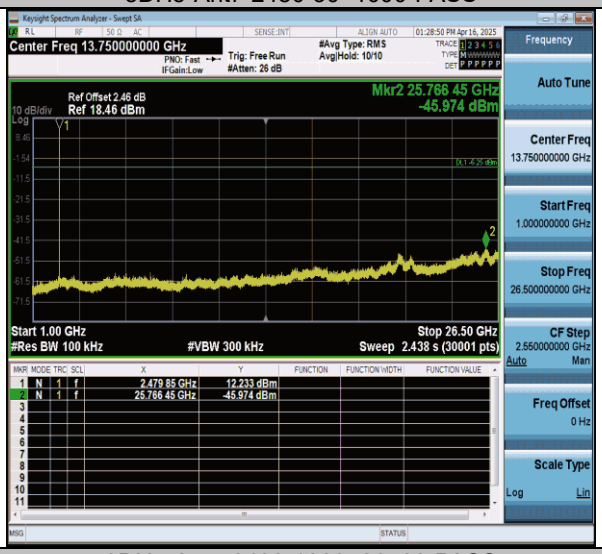


3DH5-Ant7-2480-1000~26500-PASS


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# Duty Cycle

## Test Result

| TestMode | Antenna | Frequency[MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|---|---|---|---|---|---|---|
| DH5 | Ant6 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant7 | 2402 | 2.90 | 3.76 | 77.13 | 1.13 |
| DH5 | Ant6 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant7 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant6 | 2480 | 2.89 | 3.75 | 77.07 | 1.13 |
| DH5 | Ant7 | 2480 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant6 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant7 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant6 | 2441 | 2.90 | 3.76 | 77.13 | 1.13 |
| 2DH5 | Ant7 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant6 | 2480 | 2.89 | 3.75 | 77.07 | 1.13 |
| 2DH5 | Ant7 | 2480 | 2.90 | 3.76 | 77.13 | 1.13 |
| 3DH5 | Ant6 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| 3DH5 | Ant7 | 2402 | 2.89 | 3.75 | 77.07 | 1.13 |
| 3DH5 | Ant6 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| 3DH5 | Ant7 | 2441 | 2.89 | 3.75 | 77.07 | 1.13 |
| 3DH5 | Ant6 | 2480 | 2.89 | 3.75 | 77.07 | 1.13 |
| 3DH5 | Ant7 | 2480 | 2.89 | 3.76 | 76.86 | 1.14 |


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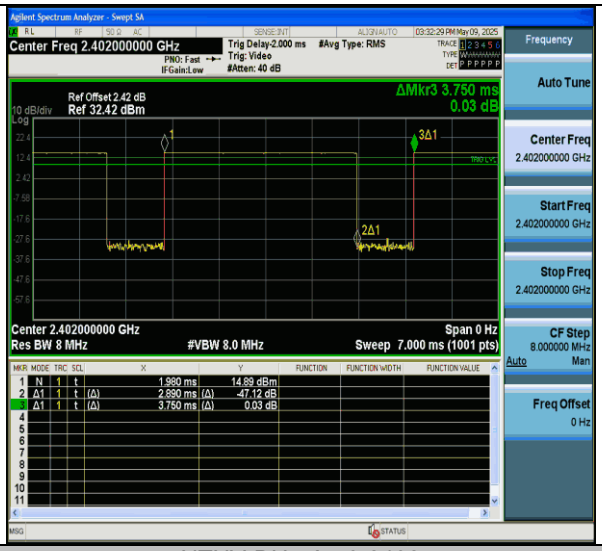
## Test Graphs

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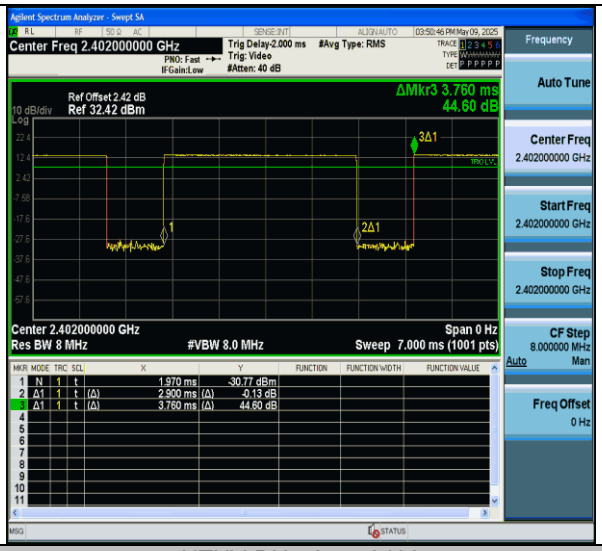
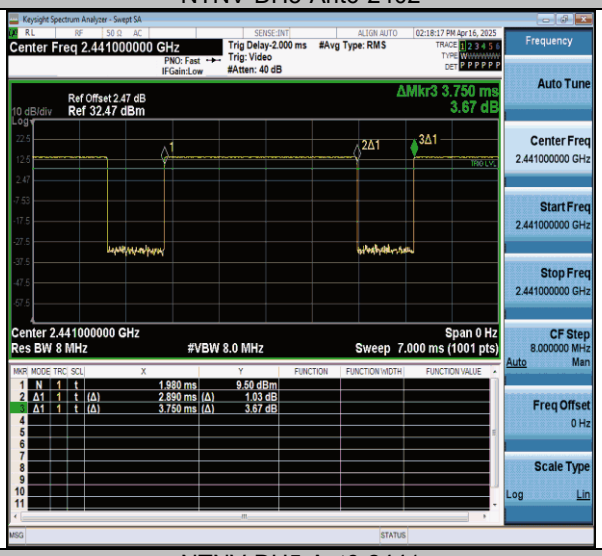



NTNV-DH5-Ant7-2402

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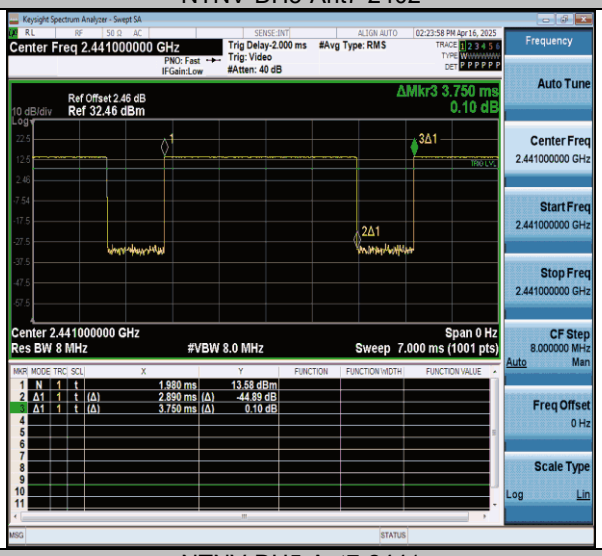


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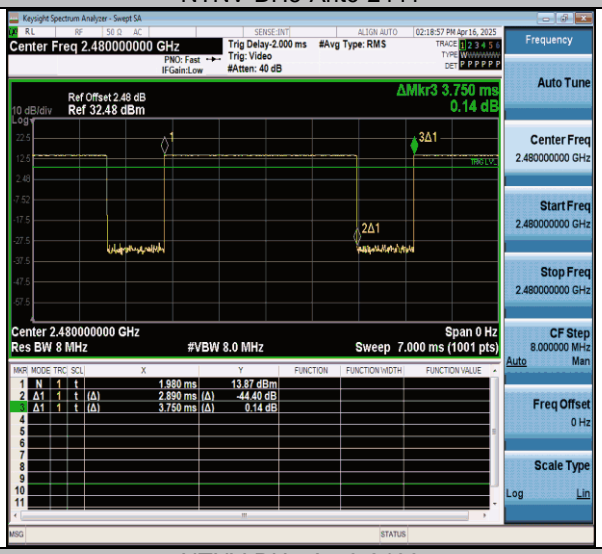


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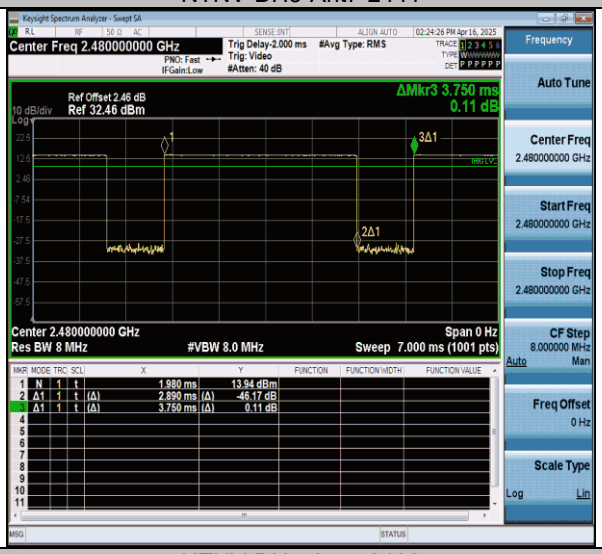


NTNV-DH5-Ant7-2480


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