

# FCC Test Report

**Report No:** WD-RF-R-250222-B0

**Product Name** : Furbo Mini 360°  
**Model Name** : Furbo Mini 360°  
**FCC ID** : 2BPVM-MINICAM3  
**Applicant** : Tomofun LLC  
**Received Date** : Feb. 07, 2025  
**Tested Date** : May 26, 2025 ~ Jul. 10, 2025  
**Applicable Standard** : 47 CFR FCC Part 15, Subpart C (Section 15.247)  
KDB 558074 D01 DTS Meas. Guidance v05  
ANSI C63.10 : 2013



**Wendell Industrial Co., Ltd**  
**Wendell EMC & RF Laboratory**

**Caution:**

This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment.

Please note that the measurement uncertainty are provided for informational purpose only and are not used in determining the Pass/Fail results.

This report must not be used to claim product endorsement by TAF or any agency of the government.

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# Test Report

Issued Date: July 10, 2025

Project No.: 25Q012105

|                                        |                                                                                                               |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Product Name</b>                    | Furbo Mini 360°                                                                                               |
| <b>Trade Name</b>                      | Furbo                                                                                                         |
| <b>Model Name</b>                      | Furbo Mini 360°                                                                                               |
| <b>FCC ID</b>                          | 2BPVM-MINICAM3                                                                                                |
| <b>Applicant</b>                       | Tomofun LLC                                                                                                   |
| <b>Manufacturer 1</b>                  | Primax Electronics Ltd.                                                                                       |
| <b>Manufacturer 2</b>                  | Primax Electronics (Thailand) Co., Ltd.                                                                       |
| <b>EUT Rated Voltage</b>               | DC 5V                                                                                                         |
| <b>EUT Test Voltage</b>                | AC 120V / 60Hz                                                                                                |
| <b>EUT Supports Radios Application</b> | WLAN 802.11b/g<br>WLAN 802.11n(HT20/HT40) and ax(HE20/40)<br>Bluetooth LE                                     |
| <b>Applicable Standard</b>             | 47 CFR FCC Part 15, Subpart C (Section 15.247)<br>KDB 558074 D01 DTS Meas. Guidance v05<br>ANSI C63.10 : 2013 |
| <b>Output Power</b>                    | 21.80 dBm                                                                                                     |
| <b>Test Result</b>                     | Complied                                                                                                      |

Documented :



( Specialist / Emma Lu )

Technical Engineer :



( Section Manager / Jason Hsieh )

Approved :



( Project Manager / Gary Wu )

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**Attachment 1: EUT Test Photographs**

**Attachment 2: EUT Detailed Photographs**

## Document Revision History

| Report No.        | Issue date    | Description    |
|-------------------|---------------|----------------|
| WD-RF-R-250222-B0 | July 10, 2025 | Initial report |

## Summary of Test Result

| Ref. Std.<br>Clause | Test Items                                           | Result |
|---------------------|------------------------------------------------------|--------|
| 15.203<br>15.247(C) | Antenna Requirement                                  | Pass   |
| 15.247(b)           | Peak Output Power                                    | Pass   |
| 15.247(a)(2)        | 6dB Bandwidth                                        | Pass   |
| 15.247(e)           | Power Spectral Density                               | Pass   |
| 15.247(d)           | Conducted Band Edges and Conducted Spurious Emission | Pass   |
| 15.247(d)           | Radiated Band Edges and Radiated Spurious Emission   | Pass   |
| 15.207              | AC Conducted Emission                                | Pass   |

## 1 Generation Information

### 1.1 Applicant

Tomofun LLC  
3038 SOFTWIND WAY, TORRANCE, CA 90505

### 1.2 Manufacturer

Primax Electronics Ltd.  
No. 669, Ruiguang Rd., Neihu Dist., Taipei City 114, Taiwan

Primax Electronics (Thailand) Co., Ltd.  
888/8 Moo.7, Klongkiew Sub-district, Banbueng District, Chonburi, Thailand

### 1.3 Description of Equipment under Test

|                                        |                                                                                                                           |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Product Name</b>                    | Furbo Mini 360°                                                                                                           |
| <b>Model No.</b>                       | Furbo Mini 360°                                                                                                           |
| <b>FCC ID</b>                          | 2BPVM-MINICAM3                                                                                                            |
| <b>Frequency Range</b>                 | 802.11b/g/n-HT20/ax-HE20: 2412~2462MHz<br>802.11n-HT40/ax-HE40: 2422~2452MHz                                              |
| <b>Number of Channels</b>              | 802.11b/g/n/ax-20MHz: 11, n/ax-40MHz: 7                                                                                   |
| <b>Data Rate</b>                       | 802.11b : 1M - 11Mbps<br>802.11g : 6M - 54Mbps<br>802.11n : up to 150Mbps<br>802.11ax : up to 286.8Mbps                   |
| <b>Channel separation</b>              | 802.11b/g/n/ax: 5 MHz                                                                                                     |
| <b>Type of Modulation</b>              | 802.11b:DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16~1024QAM) |
| <b>Antenna Information</b>             | Refer to the table “Antenna List”                                                                                         |
| <b>EUT Supports Radios Application</b> | WLAN 802.11b/g<br>WLAN 802.11n(HT20/HT40) and ax(HE20/40)<br>Bluetooth LE                                                 |
| <b>EUT Rated Voltage</b>               | DC 5V                                                                                                                     |
| <b>EUT Test Voltage</b>                | AC 120V / 60Hz                                                                                                            |

### Antenna List

| No. | Manufacturer                            | Model No.          | Antenna Type              | Peak Gain        |
|-----|-----------------------------------------|--------------------|---------------------------|------------------|
| 1   | INPAQ<br>TECHNOLOGY(SUZHOU)<br>CO., LTD | RFMTA240500NNAB005 | Metal Stamping<br>Antenna | 1 dBi for 2.4GHz |

Remark: The antenna of EUT is conforming to FCC 15.203

### Channel List

| 802.11b/g<br>802.11n-HT20/ax-HE20 |                | 802.11n-HT40/ax-HE40 |                |
|-----------------------------------|----------------|----------------------|----------------|
| Channel                           | Frequency(MHz) | Channel              | Frequency(MHz) |
| 01                                | 2412           | --                   | --             |
| 02                                | 2417           | --                   | --             |
| 03                                | 2422           | 03                   | 2422           |
| 04                                | 2427           | 04                   | 2427           |
| 05                                | 2432           | 05                   | 2432           |
| 06                                | 2437           | 06                   | 2437           |
| 07                                | 2442           | 07                   | 2442           |
| 08                                | 2447           | 08                   | 2447           |
| 09                                | 2452           | 09                   | 2452           |
| 10                                | 2457           | --                   | --             |
| 11                                | 2462           | --                   | --             |

### Test Frequencies in each operating band

| Frequency range over which the device operates in each operating band (Note 1) | Number of test frequencies required | Location of test frequencies inside the operating frequency range (Note 1,2) |
|--------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------|
| $\leq 1$ MHz                                                                   | 1                                   | near center                                                                  |
| $> 1$ MHz and $\leq 10$ MHz                                                    | 2                                   | 1 near high end,<br>1 near low end                                           |
| $> 10$ MHz                                                                     | 3                                   | 1 near high end, 1 near center,<br>and 1 near low end                        |

**Note 1:** The frequency range over which the device operates in a given operating band is the difference between the highest and lowest frequencies on which the device can be tuned within that given operating band. The frequency range can be smaller than or equal to the operating band, but cannot be greater than the operating band.

**Note 2:** In the third column of table 1, “near” means as close as possible to or at the center / low end / high end of the frequency range over which the device operates.

**Firmware / Software Version**

|   |                             |                                                                                                                                                                                                        |
|---|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Product Name                | Furbo Mini 360°                                                                                                                                                                                        |
| 2 | Model No.                   | Furbo Mini 360°                                                                                                                                                                                        |
| 3 | Test SW Version             | Putty 0.60                                                                                                                                                                                             |
| 4 | RF power setting in TEST SW | <input type="checkbox"/> RF power setting was not able to alter during testing.<br><input checked="" type="checkbox"/> RF power setting was able to alter during testing.<br>(See the following table) |

**Parameters of test software setting**

| Type of Modulation | Channel | Frequency (MHz) | Set Value |         |         |         |
|--------------------|---------|-----------------|-----------|---------|---------|---------|
|                    |         |                 | Chain A   | Chain B | Chain C | Chain D |
| 802.11b            | 01      | 2412            | 0         | --      | --      | --      |
|                    | 06      | 2437            | 0         | --      | --      | --      |
|                    | 11      | 2462            | 0         | --      | --      | --      |
| 802.11g            | 01      | 2412            | -5        | --      | --      | --      |
|                    | 06      | 2437            | -3        | --      | --      | --      |
|                    | 11      | 2462            | -3        | --      | --      | --      |
| 802.11n<br>HT20    | 01      | 2412            | -6        | --      | --      | --      |
|                    | 06      | 2437            | -4        | --      | --      | --      |
|                    | 11      | 2462            | -4        | --      | --      | --      |
| 802.11n<br>HT40    | 03      | 2422            | -13       | --      | --      | --      |
|                    | 06      | 2437            | -13       | --      | --      | --      |
|                    | 09      | 2452            | -15       | --      | --      | --      |
| 802.11ax<br>HE20   | 01      | 2412            | -7        | --      | --      | --      |
|                    | 06      | 2437            | -7        | --      | --      | --      |
|                    | 11      | 2462            | -8        | --      | --      | --      |
| 802.11ax<br>HE40   | 03      | 2422            | -13       | --      | --      | --      |
|                    | 06      | 2437            | -13       | --      | --      | --      |
|                    | 09      | 2452            | -16       | --      | --      | --      |

## 1.4 Test Mode Applicability And Tested Channel Detail

1. This device is a Furbo Mini 360° with a built-in Wi-Fi and Bluetooth transceiver.
2. These tests were performed on a sample of equipment to demonstrate compliance with 47 CFR FCC Part 15, Subpart C (Section 15.247).
3. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.
4. The worst case was found when positioned on X axis for radiated emission. Following test modes were selected for the final test, and the final worst case is recorded in the report:

| EUT Configure Mode                     | RE < 1G                             | RE ≥ 1G                             | ACM                                 | ACP                                 |
|----------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Mode 1 : Transmit (802.11b 1Mbps)      | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 2 : Transmit (802.11g 6Mbps)      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 3 : Transmit (802.11n HT20 MCS0)  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 4 : Transmit (802.11n HT40 MCS0)  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 5 : Transmit (802.11ax HE20 MCS0) | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 6 : Transmit (802.11ax HE40 MCS0) | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Mode 7 : Normal mode                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Note :** RE<1G: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

ACM: Antenna Port Conducted Measurement

ACP: AC Power Line Conducted Emission

Following channel(s) was (were) selected for the final test as listed below:

### Radiated Spurious Emission Measurement(Below 1GHz):

| EUT Configure Mode | Mode    | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|---------|-------------------|----------------|-----------------|------------------|
| --                 | 802.11g | 1 ~ 11            | 06             | OFDM            | 6                |

### Radiated Spurious Emission Measurement(Above 1GHz):

| EUT Configure Mode | Mode          | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|---------------|-------------------|----------------|-----------------|------------------|
| --                 | 802.11b       | 1 ~ 11            | 01, 06, 11     | DSSS            | 1                |
| --                 | 802.11g       | 1 ~ 11            | 01, 06, 11     | OFDM            | 6                |
| --                 | 802.11n HT20  | 1 ~ 11            | 01, 06, 11     | OFDM            | MCS 0            |
| --                 | 802.11n HT40  | 3 ~ 9             | 03, 06, 09     | OFDM            | MCS 0            |
| --                 | 802.11ax HE20 | 1 ~ 11            | 01, 06, 11     | OFDMA           | MCS 0            |
| --                 | 802.11ax HE40 | 3 ~ 9             | 03, 06, 09     | OFDMA           | MCS 0            |

**Radiated Band Edge Emission Measurement(Above 1GHz):**

| EUT Configure Mode | Mode          | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|---------------|-------------------|----------------|-----------------|------------------|
| --                 | 802.11b       | 1 ~ 11            | 01, 11         | DSSS            | 1                |
| --                 | 802.11g       | 1 ~ 11            | 01, 11         | OFDM            | 6                |
| --                 | 802.11n HT20  | 1 ~ 11            | 01, 11         | OFDM            | MCS 0            |
| --                 | 802.11n HT40  | 3 ~ 9             | 03, 09         | OFDM            | MCS 0            |
| --                 | 802.11ax HE20 | 1 ~ 11            | 01, 11         | OFDMA           | MCS 0            |
| --                 | 802.11ax HE40 | 3 ~ 9             | 03, 09         | OFDMA           | MCS 0            |

**Peak Output Power, 6dB Bandwidth, Power Spectral Density, Conducted Spurious Emission:**

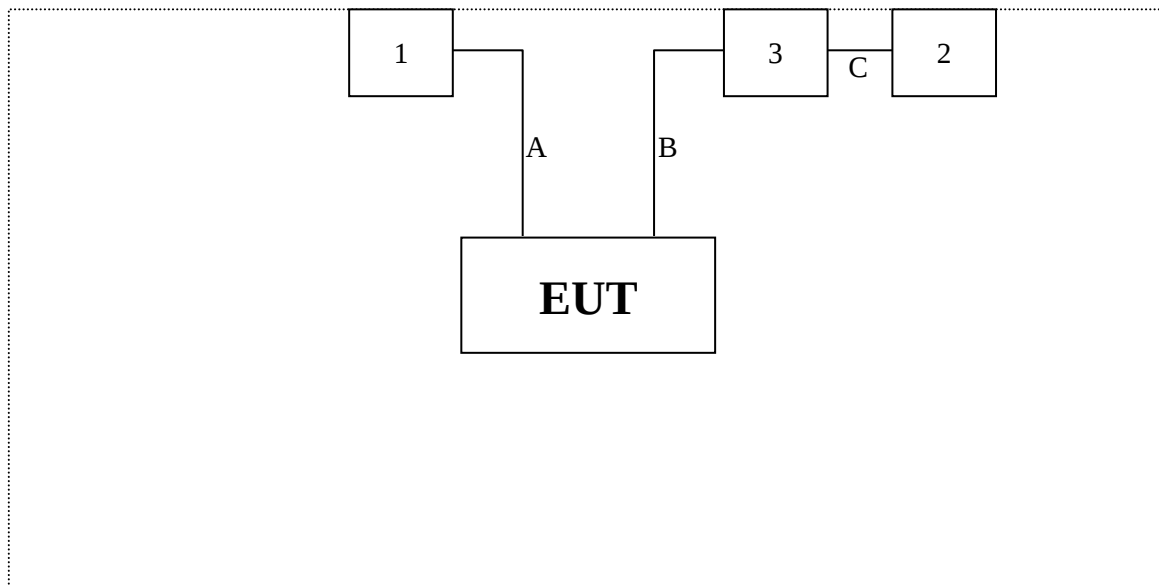
| EUT Configure Mode | Mode          | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|---------------|-------------------|----------------|-----------------|------------------|
| --                 | 802.11b       | 1 ~ 11            | 01, 06, 11     | DSSS            | 1                |
| --                 | 802.11g       | 1 ~ 11            | 01, 06, 11     | OFDM            | 6                |
| --                 | 802.11n HT20  | 1 ~ 11            | 01, 06, 11     | OFDM            | MCS 0            |
| --                 | 802.11n HT40  | 3 ~ 9             | 03, 06, 09     | OFDM            | MCS 0            |
| --                 | 802.11ax HE20 | 1 ~ 11            | 01, 06, 11     | OFDMA           | MCS 0            |
| --                 | 802.11ax HE40 | 3 ~ 9             | 03, 06, 09     | OFDMA           | MCS 0            |

**Conducted Band Edges:**

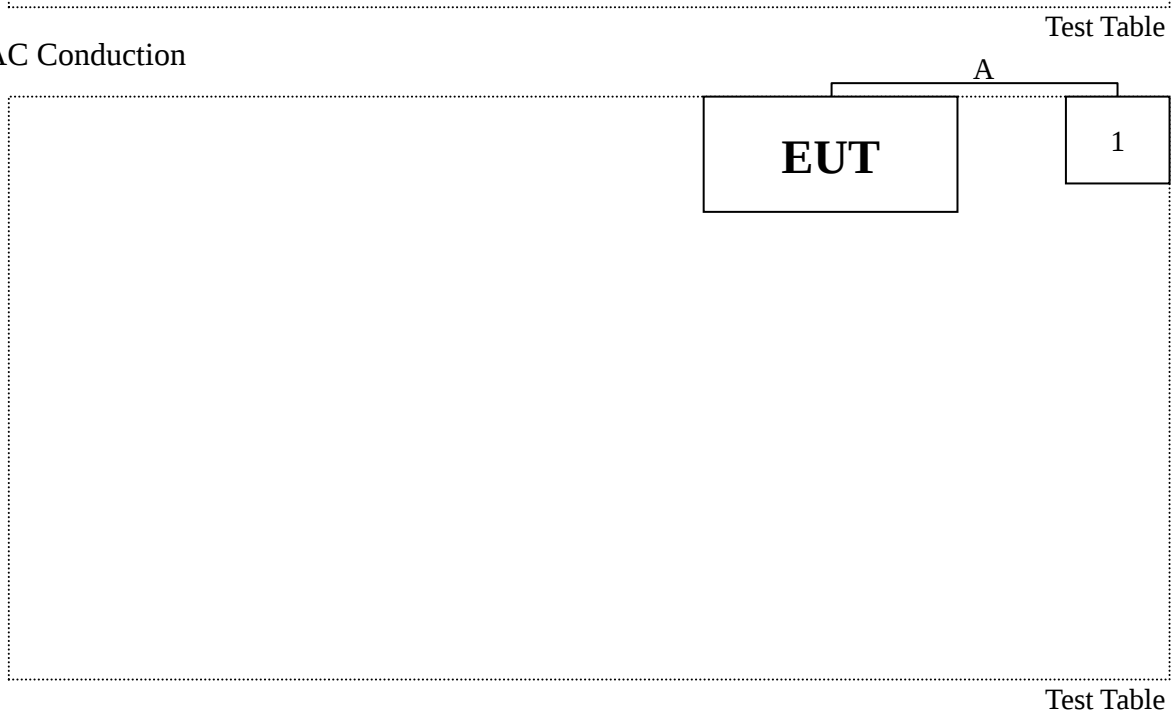
| EUT Configure Mode | Mode          | Available Channel | Tested Channel | Modulation Type | Data Rate (Mbps) |
|--------------------|---------------|-------------------|----------------|-----------------|------------------|
| --                 | 802.11b       | 1 ~ 11            | 01, 11         | DSSS            | 1                |
| --                 | 802.11g       | 1 ~ 11            | 01, 11         | OFDM            | 6                |
| --                 | 802.11n HT20  | 1 ~ 11            | 01, 11         | OFDM            | MCS 0            |
| --                 | 802.11n HT40  | 3 ~ 9             | 03, 09         | OFDM            | MCS 0            |
| --                 | 802.11ax HE20 | 1 ~ 11            | 01, 11         | OFDMA           | MCS 0            |
| --                 | 802.11ax HE40 | 3 ~ 9             | 03, 09         | OFDMA           | MCS 0            |

## 1.5 Configuration of Tested System

### Radiation



### AC Conduction



## 1.6 EUT Exercise Software

1. Setup the EUT as shown in Section 1.5
2. Execute software "Putty 0.60".
3. Configure the test mode, the test channel, and the data rate.
4. Press "OK" to start the continuous transmit.
5. Verify that the EUT works properly.

## 1.7 Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

| No. | Product     | Manufacturer | Model No. | Serial No.             | Power Cord  |
|-----|-------------|--------------|-----------|------------------------|-------------|
| 1   | Adapter     | XIAOMI       | AD16TW    | N/A                    | N/A         |
| 2   | Notebook PC | acer         | N16Q1     | NXVF4TA023742254147600 | Notebook PC |
| 3   | Fixture     | NA           | NA        | N/A                    | N/A         |

| No. | Signal Cable Type | Signal cable Description      |
|-----|-------------------|-------------------------------|
| A   | USB Cable         | Non-shielded, Non-Core, 1.8m  |
| B   | Data Cable        | Non-shielded, Non-Core, 0.65m |
| C   | USB Cable         | Shielded, Non-Core, 1.0m      |

Accessories:

| No. | Product   | Manufacturer | Model No. | Signal cable Description     |
|-----|-----------|--------------|-----------|------------------------------|
| A   | USB Cable | Lemark       | LM10839C  | Non-shielded, Non-Core, 1.8m |

## 1.8 Test Facility

| Items                      | Required (IEC 60068-1) |
|----------------------------|------------------------|
| Temperature (°C)           | 15-35                  |
| Humidity (% RH)            | 25-75                  |
| Barometric pressure (mbar) | 860-1060               |

**Description:** Accredited by TAF

Accredited Number: 2965

**Issued by:** Wendell Industrial Co., Ltd

**Company Address:** 6F/6F-1, No.188, Baoqiao Rd., Xindian Dist.,  
New Taipei City 23145, Taiwan R.O.C

**Test Lab:** Wendell EMC & RF Laboratory

**Lab Address:** 5F-1, No.188, Baoqiao Rd., Xindian Dist.,  
New Taipei City 23145, Taiwan R.O.C

**Test Location:** No. 119, Wugong 3rd Rd., Wugu Dist.,  
New Taipei City 248, Taiwan (R.O.C.)

**Designation Number:** TW0025

**Test Firm Registration Number:** 665221

## 1.9 Measurement Uncertainty

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

| Measurement Project                  | Condition           | Expended Uncertainty |
|--------------------------------------|---------------------|----------------------|
| AC Conducted Emission                | 0.150 ~ 30 MHz      | ± 2.7 dB             |
| Radiated Emission                    | 0.009 ~ 30 MHz      | ± 1.8 dB             |
|                                      | 30 ~ 1000 MHz       | ± 1.8 dB             |
|                                      | 1000 ~ 18000 MHz    | ± 3.0 dB             |
|                                      | 18000 ~ 40000 MHz   | ± 3.0 dB             |
| RF Power, Conducted                  | Conducted Measuring | ± 1.3 dB             |
| Occupied Bandwidth                   | Conducted Measuring | ± 2.4 %              |
| Power Density                        | Conducted Measuring | ± 1.2 dB             |
| Duty Cycle and Dwell Time            | Conducted Measuring | ± 0.9 %              |
| Conducted Unwanted Emission Strength | Conducted Measuring | ± 1.4 dB             |
| DC Power Supply                      | --                  | ± 0.068 ppm          |
| Temperature                          | --                  | ± 2.1 %              |
| Humidity                             | --                  | ± 0.58 °C            |

**Note:** Please note that the measurement uncertainty are provided for informational purpose only and are not used in determining the Pass/Fail results.

## 1.10 List of Test Equipment

### For Conducted measurements / W08-Conducted Measurement

|   | Equipment                              | Manufacturer | Model No.  | Serial No. | Cal. Date  | Due Date   |
|---|----------------------------------------|--------------|------------|------------|------------|------------|
| ✓ | Spectrum analyzer                      | Keysight     | N9010A     | SG50420005 | 2024/08/09 | 2025/08/08 |
| ✓ | Wideband Peak Power Meter              | Anritsu      | ML2495A    | 1733007    | 2024/09/05 | 2025/09/04 |
| ✓ | Pulse Power Sensor + Precision Adaptor | Anritsu      | MA2411B    | 1726022    | 2024/09/05 | 2025/09/04 |
|   | Temperature Chamber                    | TAICHY       | MHK-225LK  | 1061121    | 2025/04/19 | 2026/04/18 |
|   | Wireless Connectivity Tester           | R&S          | CMW270     | 101307     | 2025/06/07 | 2026/06/06 |
| ✓ | Attenuator                             | MVE          | MVE2211-10 | CT-9-056   | 2024/08/08 | 2026/08/07 |
|   | Attenuator                             | MVE          | MVE2211-20 | CT-9-057   | 2024/08/08 | 2026/08/07 |
|   | Attenuator                             | MVE          | MVE2211-30 | CT-9-058   | 2024/08/08 | 2026/08/07 |
|   | Power Divider                          | MVE          | MVE8546    | 170826003  | 2024/08/08 | 2026/08/07 |
|   | Power Splitter                         | MVE          | MVE8547    | 170302047  | 2024/08/10 | 2026/08/09 |
|   | DC Power Supply                        | GW INSTRON   | GPC-3060D  | GER817636  | 2024/08/05 | 2025/08/04 |

#### Remark:

1. The equipments are calibrated every one year.
2. The Attenuator/ Divider/ Splitter are calibrated every two year.
3. The test instruments marked with “✓” are used to measure the final test results.

**For AC Conduction measurements / W08-CE**

|   | Equipment                    | Manufacturer                  | Model No.                    | Serial No. | Cal. Date  | Due Date   |
|---|------------------------------|-------------------------------|------------------------------|------------|------------|------------|
| ✓ | EMI Test Receiver            | R&S                           | ESR3                         | 102309     | 2025/05/20 | 2026/05/19 |
| ✓ | 2-Line V-Network<br>LISN     | R&S                           | ENV216                       | 101185     | 2025/05/25 | 2026/05/24 |
| ✓ | LISN                         | SCHWARZBECK                   | NSLK 8127RC                  | 05028      | 2025/05/25 | 2026/05/24 |
| ✓ | Transient Limiter            | EM Electronics<br>Corporation | EM-7600                      | 857        | 2025/05/21 | 2026/05/20 |
| ✓ | 50ohm Cable                  | EMCI                          | EMCCFD300-BM-BM-<br>5000     | 170612     | 2025/05/21 | 2026/05/20 |
| ✓ | 50 ohm terminal<br>impedance | HUBER+SUHNER                  | 50 ohm terminal<br>impedance | CT-1-109-1 | 2025/05/26 | 2026/05/25 |

**Remark:**

1. All equipments are calibrated every one year.
2. The test instruments marked with “✓” are used to measure the final test results.
3. Test Software version: FARAD EZ-EMC Ver.EMC-CON 3A1

**For Radiated measurements / W08-996-2**

|   | Equipment                  | Manufacturer | Model No.         | Serial No.            | Cal. Date  | Due Date   |
|---|----------------------------|--------------|-------------------|-----------------------|------------|------------|
| ✓ | EMI Receiver               | Keysight     | N9038A            | MY51210173            | 2024/08/21 | 2025/08/20 |
| ✓ | Spectrum Analyzer          | Keysight     | N9010A            | MY52220228            | 2024/08/19 | 2025/08/18 |
| ✓ | Active Loop Antenna        | Schwarzbeck  | FMZB 1513-60B     | 00033                 | 2025/04/28 | 2026/04/27 |
| ✓ | TRILOG super broad Antenna | Schwarzbeck  | VULB 9168         | VULB 9168-700 & 20E03 | 2024/07/23 | 2025/07/22 |
| ✓ | Horn Antenna               | Schwarzbeck  | BBHA 9120D        | 01767                 | 2024/08/15 | 2025/08/14 |
| ✓ | Horn Antenna               | Schwarzbeck  | BBHA 9170         | 703                   | 2024/08/15 | 2025/08/14 |
| ✓ | Pre-Amplifier              | EM           | EMC330            | 060774                | 2024/08/16 | 2025/08/15 |
| ✓ | Pre-Amplifier              | EMEC         | EM01G18G          | 060648                | 2024/08/16 | 2025/08/15 |
| ✓ | Pre-Amplifier              | JPT          | JPA0118-55-303K   | 1910001800055003      | 2024/08/20 | 2025/08/19 |
| ✓ | Pre-Amplifier              | EMCI         | EMC184045SE       | 980515                | 2024/08/16 | 2025/08/15 |
| ✓ | Cable                      | EMEC         | EM-CB400          | 105060103             | 2024/08/21 | 2025/08/20 |
| ✓ | Cable                      | EMEC         | EM-CB400          | 105060102             | 2024/08/21 | 2025/08/20 |
| ✓ | Cable                      | EMEC         | EM-CB400          | 105060101             | 2024/08/21 | 2025/08/20 |
| ✓ | RF Cable                   | HUBER+SUHNER | SF102             | MY2752/2              | 2024/08/21 | 2025/08/20 |
| ✓ | RF Cable                   | MVE          | 280280.LL266.1200 | C90177C               | 2024/08/21 | 2025/08/20 |
| ✓ | RF Cable                   | EMCI         | EMC102-KM-KM-600  | 190646                | 2024/08/21 | 2025/08/20 |
| ✓ | RF Cable                   | MVE          | 140140.LL404.700  | B90014C               | 2024/08/21 | 2025/08/20 |
| ✓ | RF Cable                   | MVE          | 140140.LL404.300  | B90006C               | 2024/08/21 | 2025/08/20 |
| ✓ | RF Filter                  | EMEC         | BRF-2400-2500     | 002                   | 2024/08/26 | 2026/08/25 |
|   | RF Filter                  | EMEC         | BRF-5150-5350     | 104                   | 2024/08/26 | 2026/08/25 |
|   | RF Filter                  | EMEC         | BRF-5470-5725     | 092                   | 2024/08/26 | 2026/08/25 |
|   | RF Filter                  | EMEC         | BRF-5725-5875     | 091                   | 2024/08/26 | 2026/08/25 |
| ✓ | RF Filter                  | EMEC         | HPF-2800          | 002                   | 2024/08/26 | 2026/08/25 |
|   | RF Filter                  | EMEC         | HPF-5850          | 059                   | 2024/08/26 | 2026/08/25 |
|   | SMA Notch Filter           | MVE          | MFN-902.928.S1    | 190604001             | 2024/08/21 | 2026/08/20 |

Remark:

1. The equipments are calibrated every one year.
2. The Filter calibrated every two year.
3. The test instruments marked with “✓” are used to measure the final test results.
4. Test Software version: FARAD EZ-EMC Ver.WD-03A1-1

## **2 Test Result**

### **2.1 Antenna Requirement**

#### **2.1.1 Applicable Standard**

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. 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.

An intentional radiator shall be designed to ensure that no antenna other than as furnished by the responsible party shall be used with the device. If transmitting antennas of directional gain greater than 6dBi are using the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi, for compliance to FCC 47CFR 15.247 (c) requirements.

#### **2.1.2 Antenna Connected Construction**

Non-standard antenna connector is used.

### 2.1.3 Antenna Gain

| No. | Manufacturer                            | Model No.          | Antenna Type              | Peak Gain        |
|-----|-----------------------------------------|--------------------|---------------------------|------------------|
| 1   | INPAQ<br>TECHNOLOGY(SUZHOU)<br>CO., LTD | RFMTA240500NNAB005 | Metal Stamping<br>Antenna | 1 dBi for 2.4GHz |

#### Description of the operating transmit modes :

- \* 802.11b : Only one Antenna mode, this port is Ant-1
- \* 802.11g : Only one Antenna mode, this port is Ant-1
- \* 802.11n\_HT20 : Only one Antenna mode, this port is Ant-1
- \* 802.11n\_HT40 : Only one Antenna mode, this port is Ant-1
- \* 802.11ax\_HE20 : Only one Antenna mode, this port is Ant-1
- \* 802.11ax\_HE40 : Only one Antenna mode, this port is Ant-1

#### Directional gain calculation & Conducted Output Power limit after correction :

- \* 802.11b : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11g : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11n\_HT20 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11n\_HT40 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11ax\_HE20 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11ax\_HE40 : Gain = 1 dBi  $\leq$  6dBi ;

#### Directional gain calculation & Power Spectral Density limit after correction :

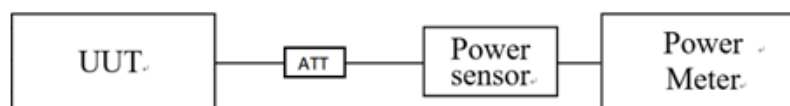
- \* 802.11b : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11g : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11n\_HT20 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11n\_HT40 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11ax\_HE20 : Gain = 1 dBi  $\leq$  6dBi ;
- \* 802.11ax\_HE40 : Gain = 1 dBi  $\leq$  6dBi ;

## 2.2 Peak Output Power Measurement

### 2.2.1 Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 1W. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 2.2.2 Test Setup



### 2.2.3 Test Procedure

1. Reference ANSI C63.10 : 2013 chapter 11.9.1.3
2. Enable the EUT transmit continuously.
3. Let EUT be connected to the power meter, and record the max. reading.
4. Measurement using a gated RF average power meter, since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

## 2.2.4 Test Result

| Mode             | Frequency (MHz) | Peak power (dBm) |         |       | Limit (dBm) | Result |
|------------------|-----------------|------------------|---------|-------|-------------|--------|
|                  |                 | Chain A          | Chain B | Total |             |        |
| 802.11b          | 2412            | 18.21            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 18.60            | --      | --    | $\leq 30$   | Pass   |
|                  | 2462            | 16.66            | --      | --    | $\leq 30$   | Pass   |
| 802.11g          | 2412            | 20.75            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 21.80            | --      | --    | $\leq 30$   | Pass   |
|                  | 2462            | 20.05            | --      | --    | $\leq 30$   | Pass   |
| 802.11n<br>HT20  | 2412            | 20.65            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 21.72            | --      | --    | $\leq 30$   | Pass   |
|                  | 2462            | 19.92            | --      | --    | $\leq 30$   | Pass   |
| 802.11n<br>HT40  | 2422            | 17.44            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 17.67            | --      | --    | $\leq 30$   | Pass   |
|                  | 2452            | 16.44            | --      | --    | $\leq 30$   | Pass   |
| 802.11ax<br>HE20 | 2412            | 20.85            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 21.07            | --      | --    | $\leq 30$   | Pass   |
|                  | 2462            | 18.72            | --      | --    | $\leq 30$   | Pass   |
| 802.11ax<br>HE40 | 2422            | 17.32            | --      | --    | $\leq 30$   | Pass   |
|                  | 2437            | 17.56            | --      | --    | $\leq 30$   | Pass   |
|                  | 2452            | 15.99            | --      | --    | $\leq 30$   | Pass   |

Remark:

1. Peak Power = Reading value on power meter + cable loss
2.  $10 \log(X/\text{mW}) = \text{dBm}$ ,  $X=1 \text{ watt}$  (Limit)  
1 watt = 30 dBm

## 2.3 6dB Bandwidth Measurement

### 2.3.1 Limit

The minimum 6 dB bandwidth shall be at least 500 kHz.

### 2.3.2 Test Setup



### 2.3.3 Test Procedure

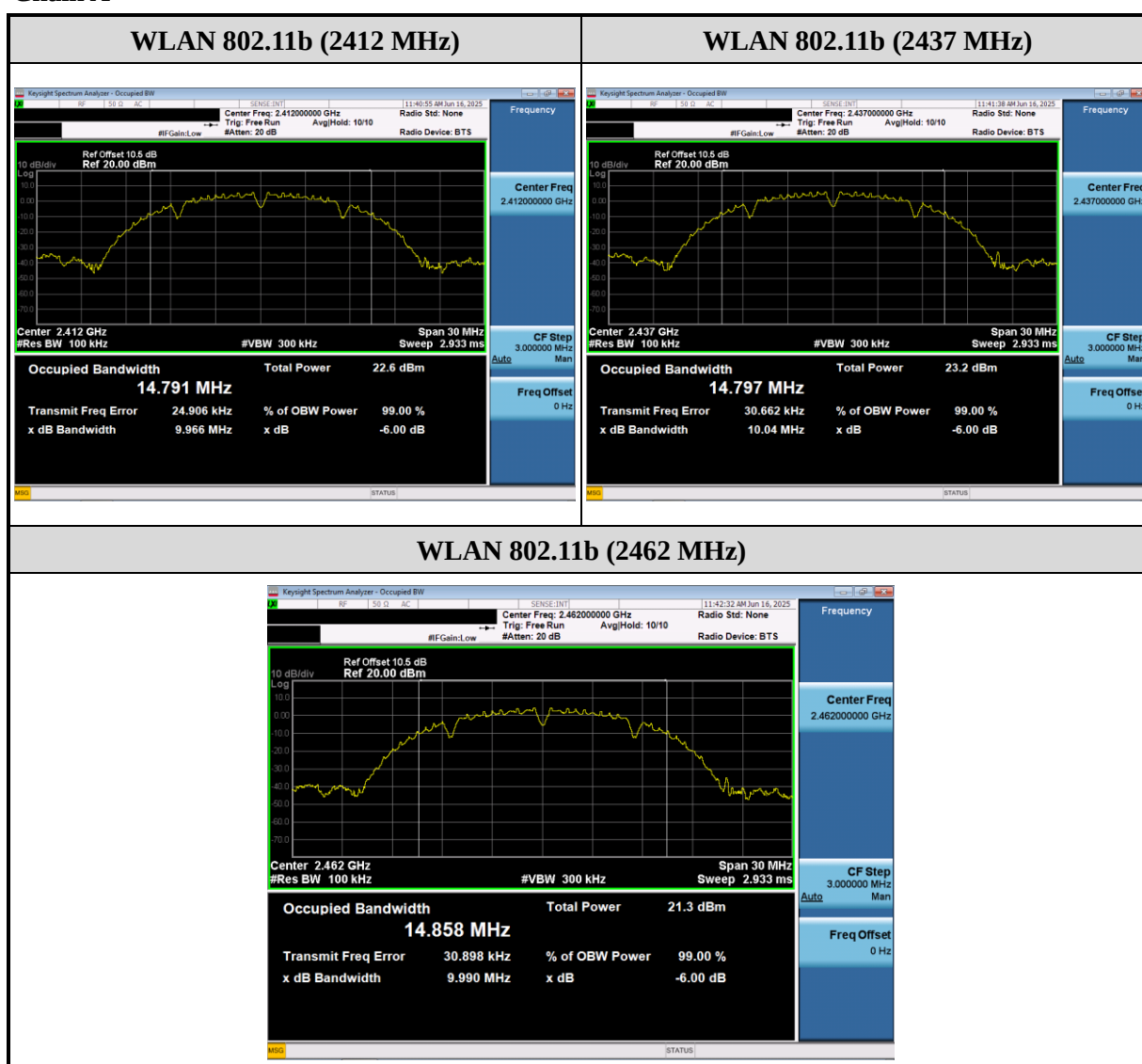
1. Reference ANSI C63.10 : 2013 chapter 11.8.2
2. Enable the EUT transmit continuously.
3. Spectrum analyzer set:
  - a) RBW = 100 kHz
  - b) VBW  $\geq$  3 RBW
  - c) Detector = peak
  - d) Sweep time = auto couple
  - e) Trace mode = max hold.

## 2.3.4 Test Result

### 802.11b

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2412            | 9966         | --      | $\geq 500$  | Pass   |
| 2437            | 10040        | --      | $\geq 500$  | Pass   |
| 2462            | 9990         | --      | $\geq 500$  | Pass   |

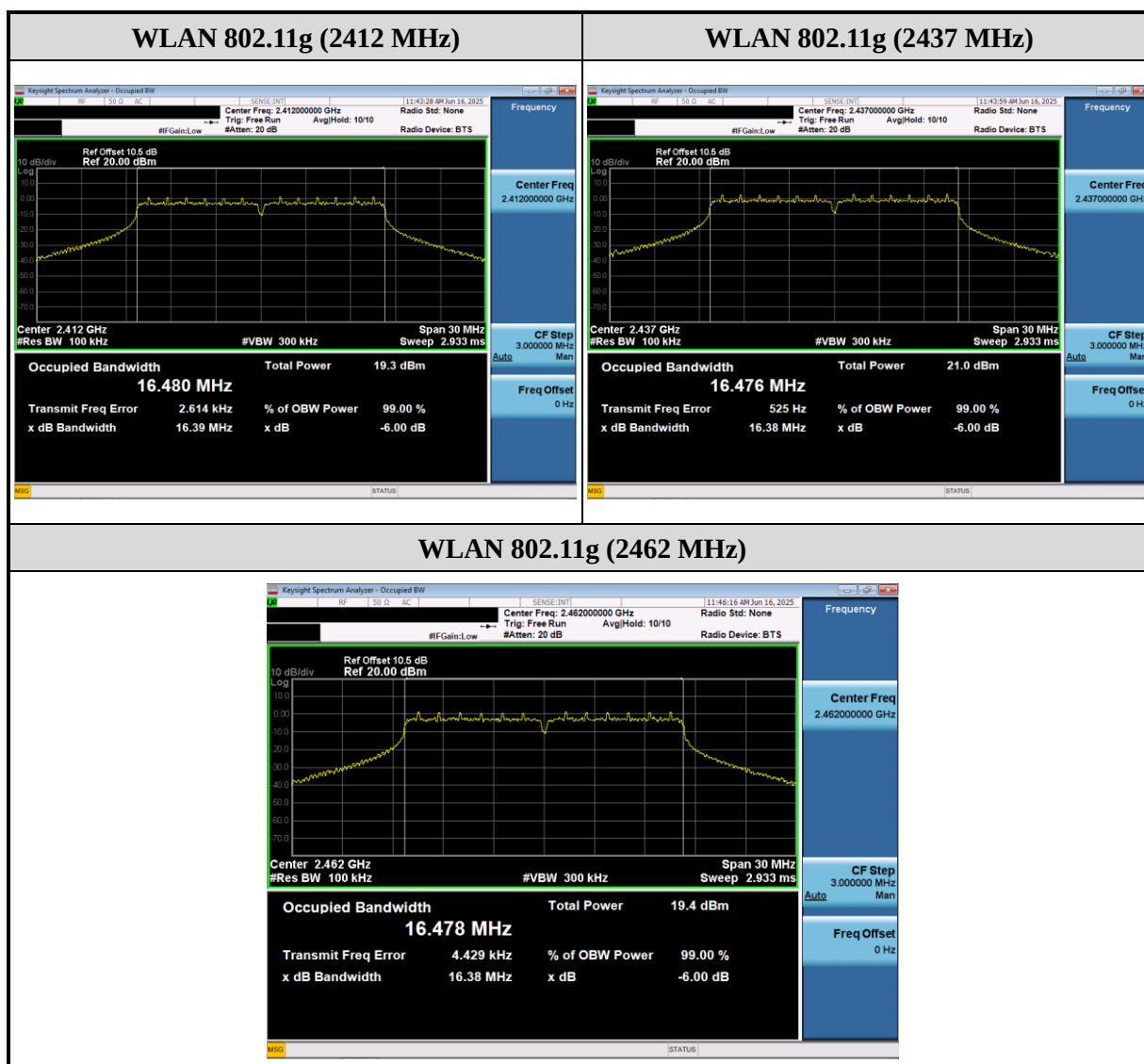
### Chain A



## 802.11g

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2412            | 16390        | --      | $\geq 500$  | Pass   |
| 2437            | 16380        | --      | $\geq 500$  | Pass   |
| 2462            | 16380        | --      | $\geq 500$  | Pass   |

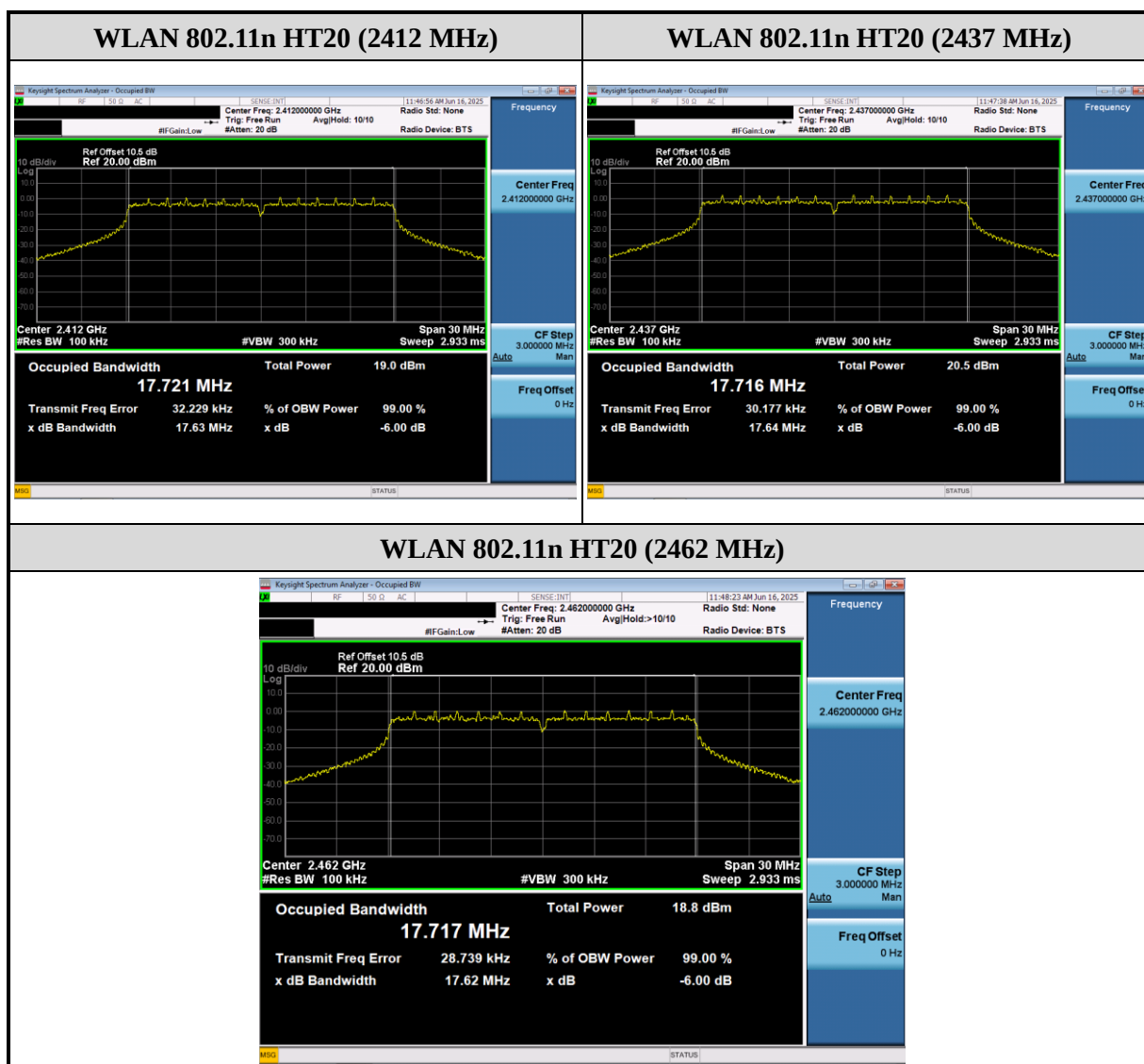
## Chain A



## 802.11n HT20

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2412            | 17630        | --      | $\geq 500$  | Pass   |
| 2437            | 17640        | --      | $\geq 500$  | Pass   |
| 2462            | 17620        | --      | $\geq 500$  | Pass   |

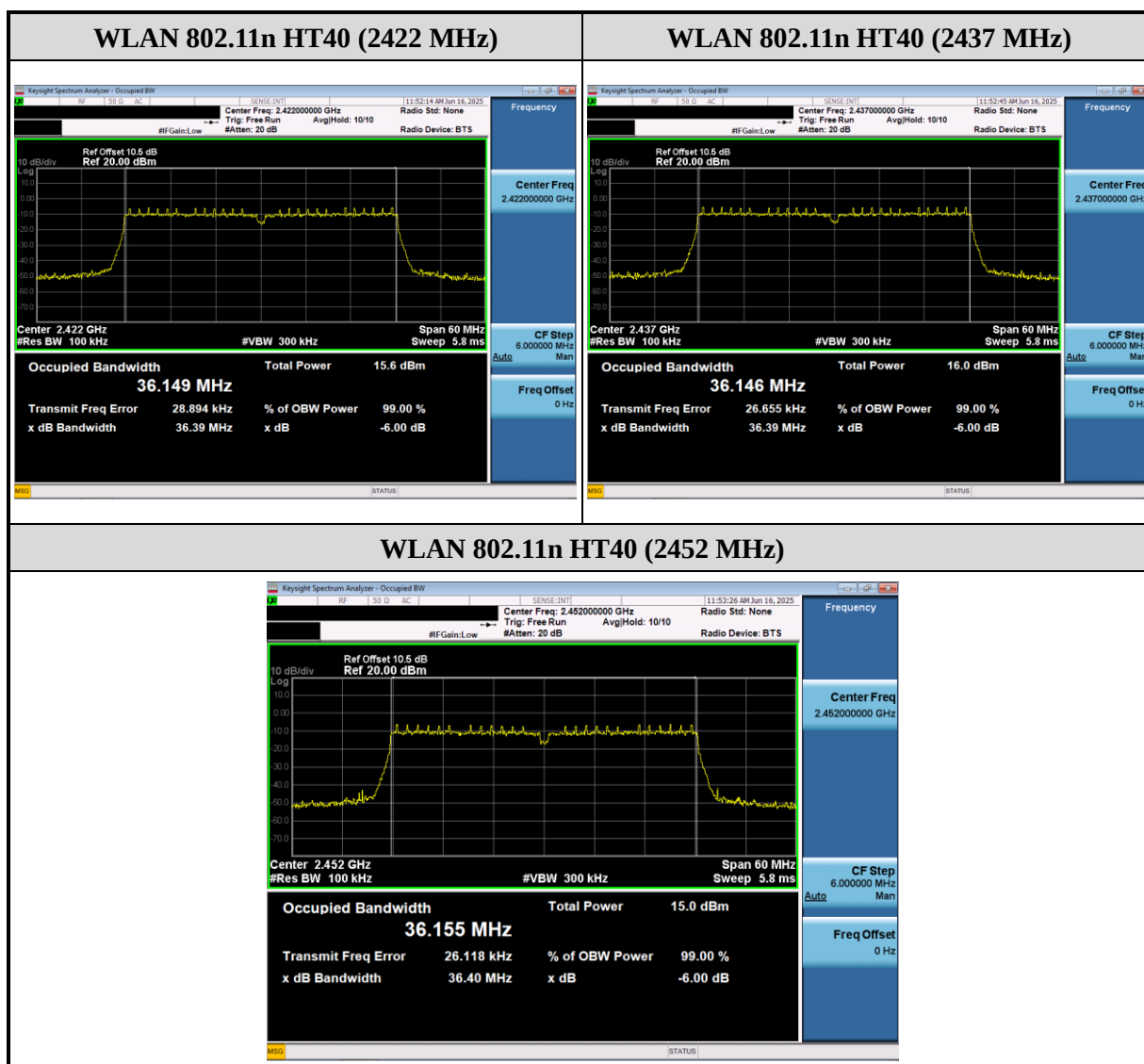
## Chain A



## 802.11n HT40

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2422            | 36390        | --      | $\geq 500$  | Pass   |
| 2437            | 36390        | --      | $\geq 500$  | Pass   |
| 2452            | 36400        | --      | $\geq 500$  | Pass   |

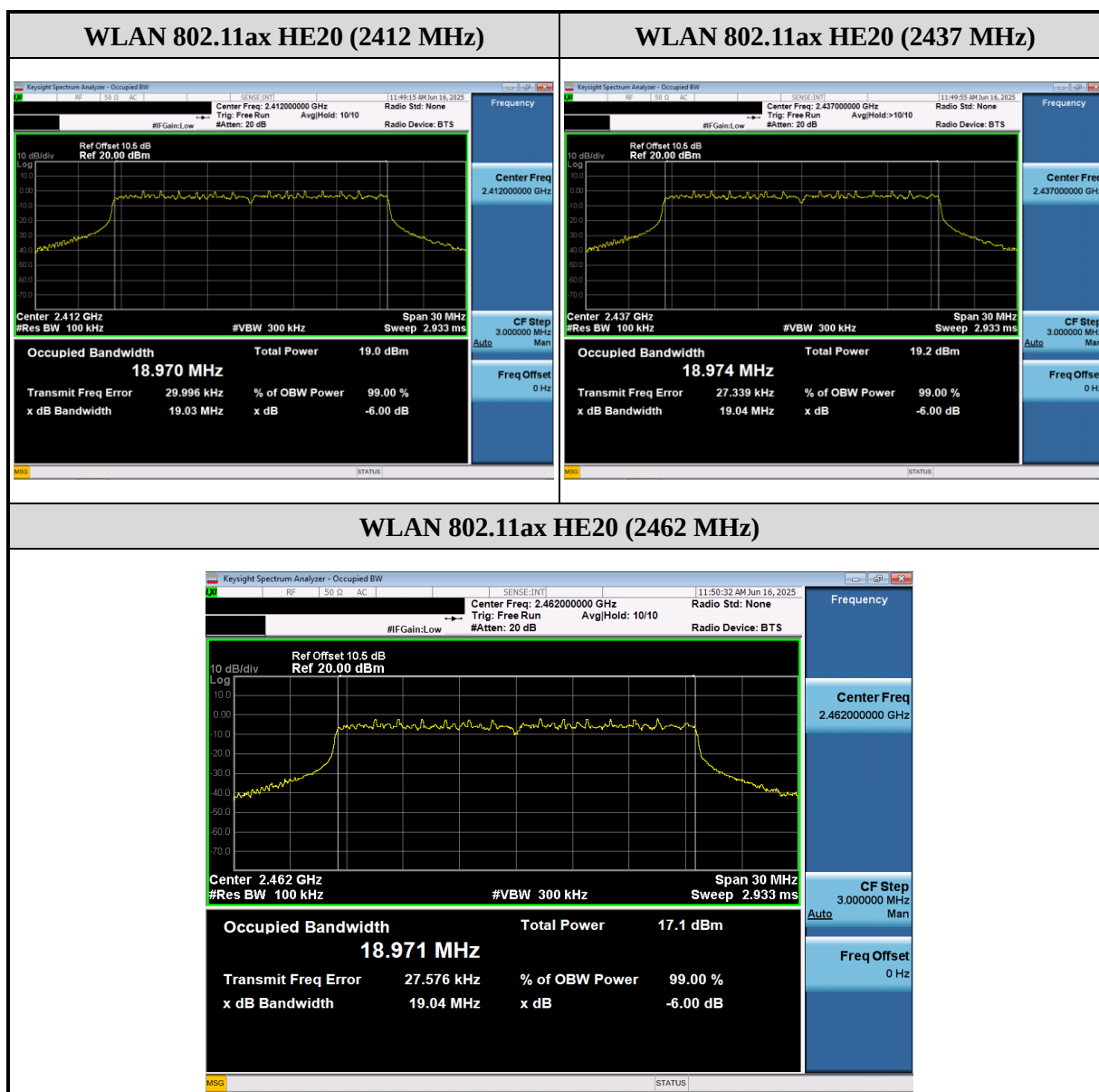
## Chain A



## 802.11ax HE20

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2412            | 19030        | --      | $\geq 500$  | Pass   |
| 2437            | 19040        | --      | $\geq 500$  | Pass   |
| 2462            | 19040        | --      | $\geq 500$  | Pass   |

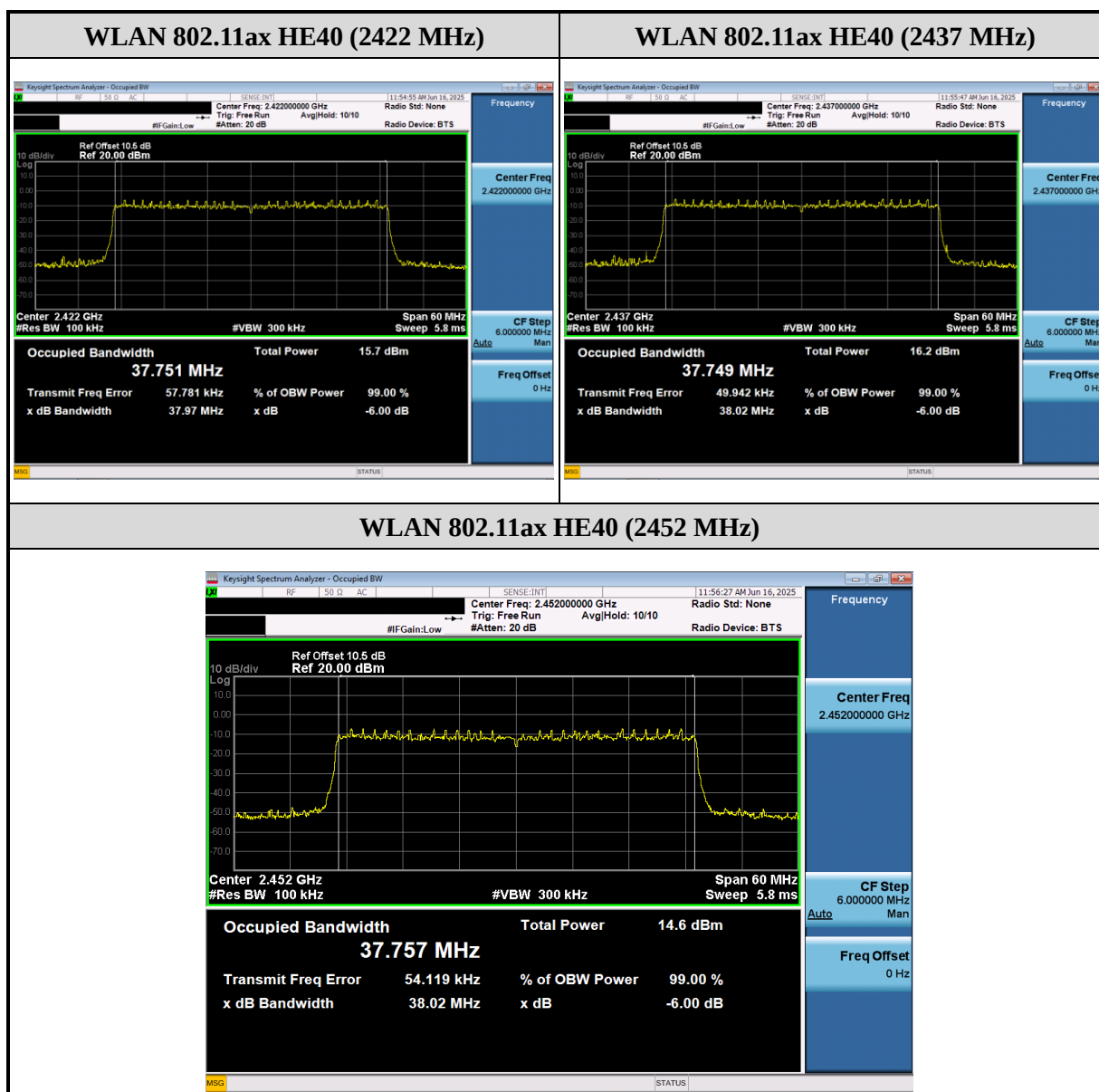
## Chain A



## 802.11ax HE40

| Frequency (MHz) | 6dB BW (kHz) |         | Limit (kHz) | Result |
|-----------------|--------------|---------|-------------|--------|
|                 | Chain A      | Chain B |             |        |
| 2422            | 37970        | --      | $\geq 500$  | Pass   |
| 2437            | 38020        | --      | $\geq 500$  | Pass   |
| 2452            | 38020        | --      | $\geq 500$  | Pass   |

## Chain A



## 2.4 Power Spectral Density Measurement

### 2.4.1 Limit

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

### 2.4.2 Test Setup



### 2.4.3 Test Procedure

1. Reference ANSI C63.10 : 2013 chapter 11.10.2
2. Enable the EUT transmit continuously.
3. Spectrum analyzer set:
  - a) RBW = 3 kHz ~ 100 kHz
  - b) VBW  $\geq$  3 RBW
  - c) Span = 1.5 times DTS Channel 6dB Bandwidth
  - d) Detector = peak
  - e) Sweep time = auto couple
  - f) Trace mode = max hold.

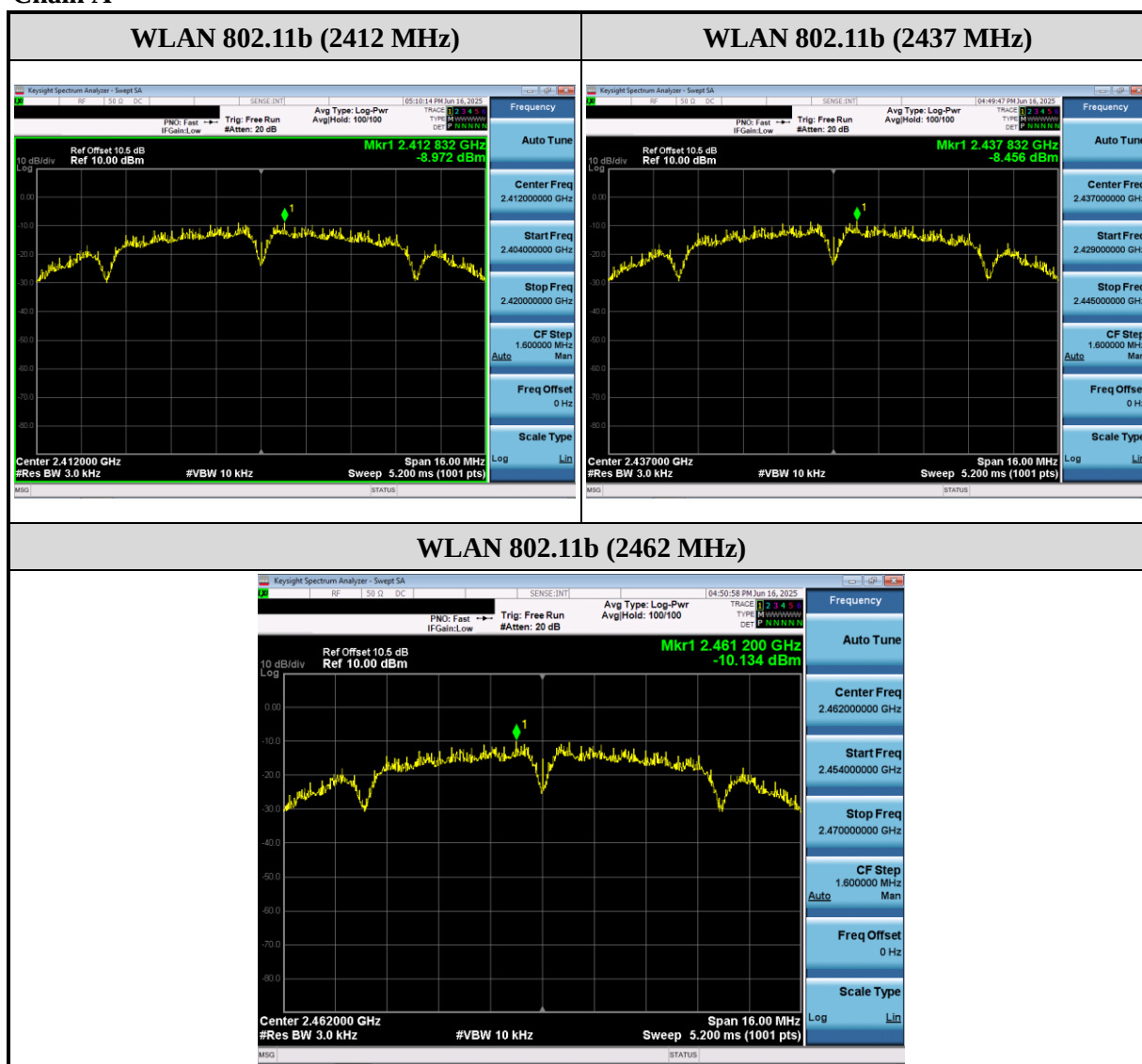
## 2.4.4 Test Result

### 802.11b

| Frequency (MHz) | Power Spectral Density (dBm) |         |       | Limit (dBm) | Result |
|-----------------|------------------------------|---------|-------|-------------|--------|
|                 | Chain A                      | Chain B | Total |             |        |
| 2412            | -8.972                       | --      | --    | $\leq 8$    | Pass   |
| 2437            | -8.456                       | --      | --    | $\leq 8$    | Pass   |
| 2462            | -10.134                      | --      | --    | $\leq 8$    | Pass   |

Remark: PSD = Reading value on spectrum analyzer + cable loss

### Chain A

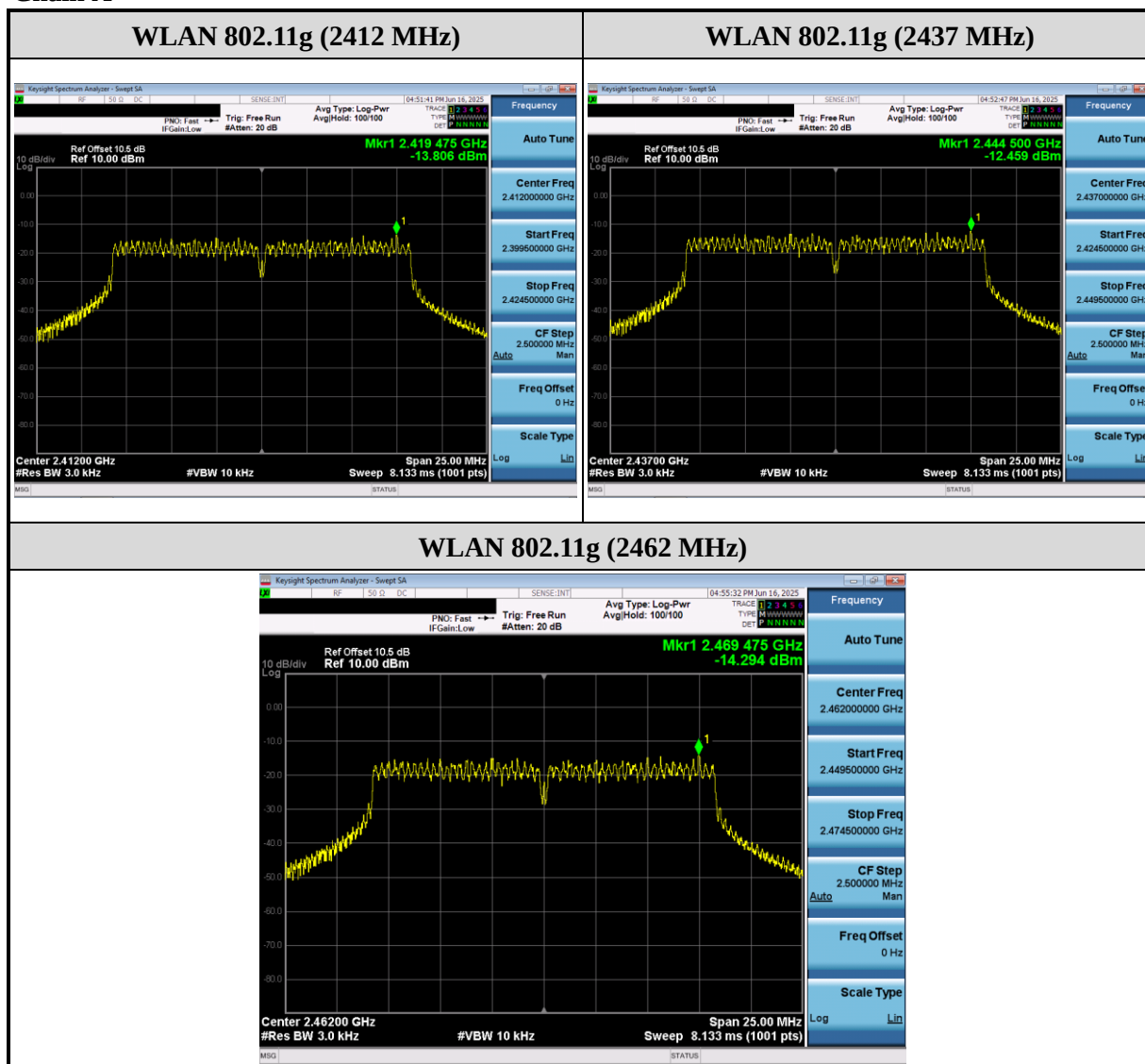


### 802.11g

| Frequency (MHz) | Power Spectral Density (dBm) |         |       | Limit (dBm) | Result |
|-----------------|------------------------------|---------|-------|-------------|--------|
|                 | Chain A                      | Chain B | Total |             |        |
| 2412            | -13.806                      | --      | --    | $\leq 8$    | Pass   |
| 2437            | -12.459                      | --      | --    | $\leq 8$    | Pass   |
| 2462            | -14.294                      | --      | --    | $\leq 8$    | Pass   |

Remark: PSD = Reading value on spectrum analyzer + cable loss

### Chain A



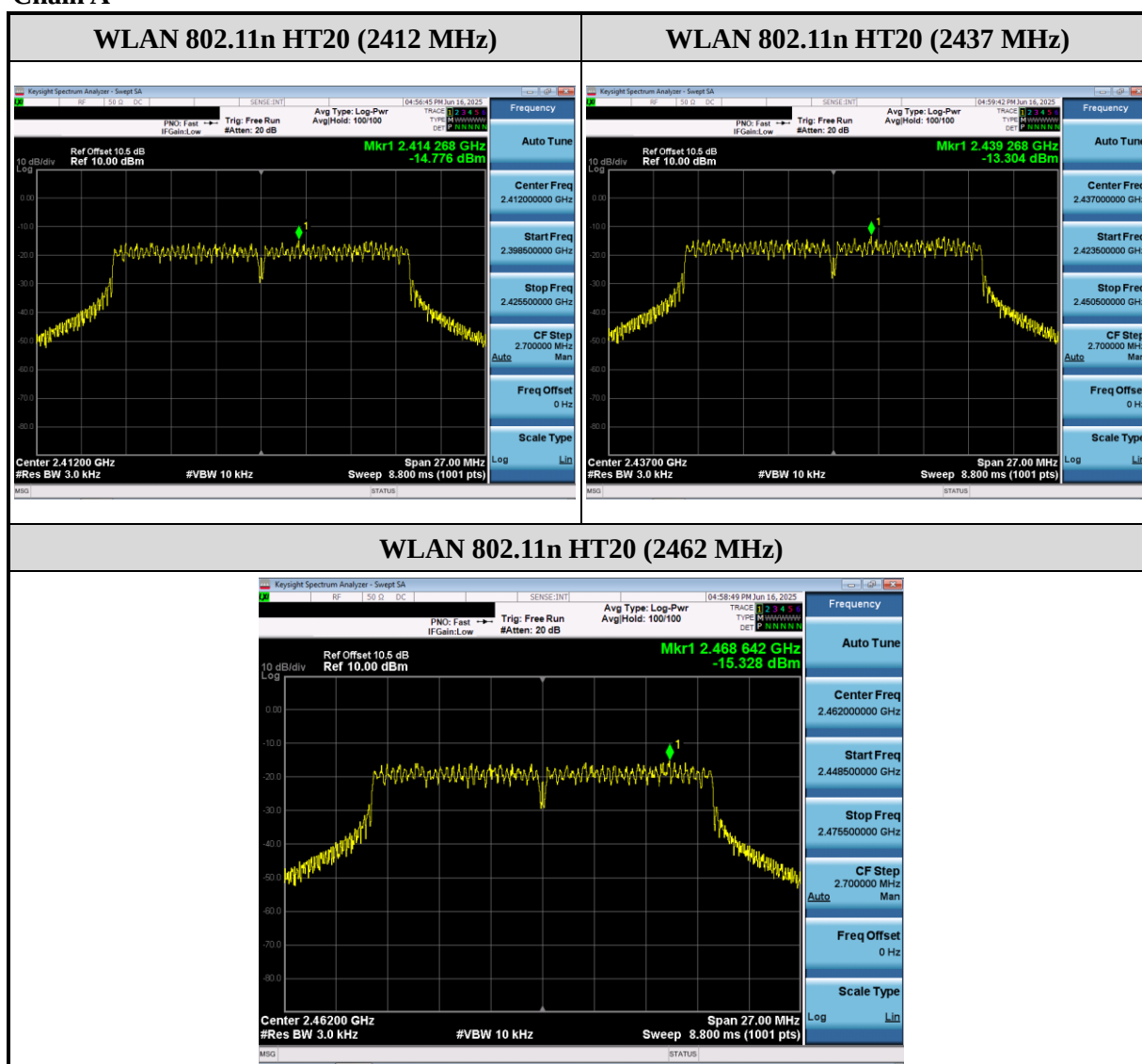
## 802.11n HT20

| Frequency (MHz) | Power Spectral Density (dBm) |         |       | Limit (dBm) | Result |
|-----------------|------------------------------|---------|-------|-------------|--------|
|                 | Chain A                      | Chain B | Total |             |        |
| 2412            | -14.776                      | --      | --    | $\leq 8$    | Pass   |
| 2437            | -13.304                      | --      | --    | $\leq 8$    | Pass   |
| 2462            | -15.328                      | --      | --    | $\leq 8$    | Pass   |

Remark:

1. PSD = Reading value on spectrum analyzer + cable loss
2. Section E) method 2) b) of power density measurement of KDB 662911 is used for calculating total power density.

## Chain A



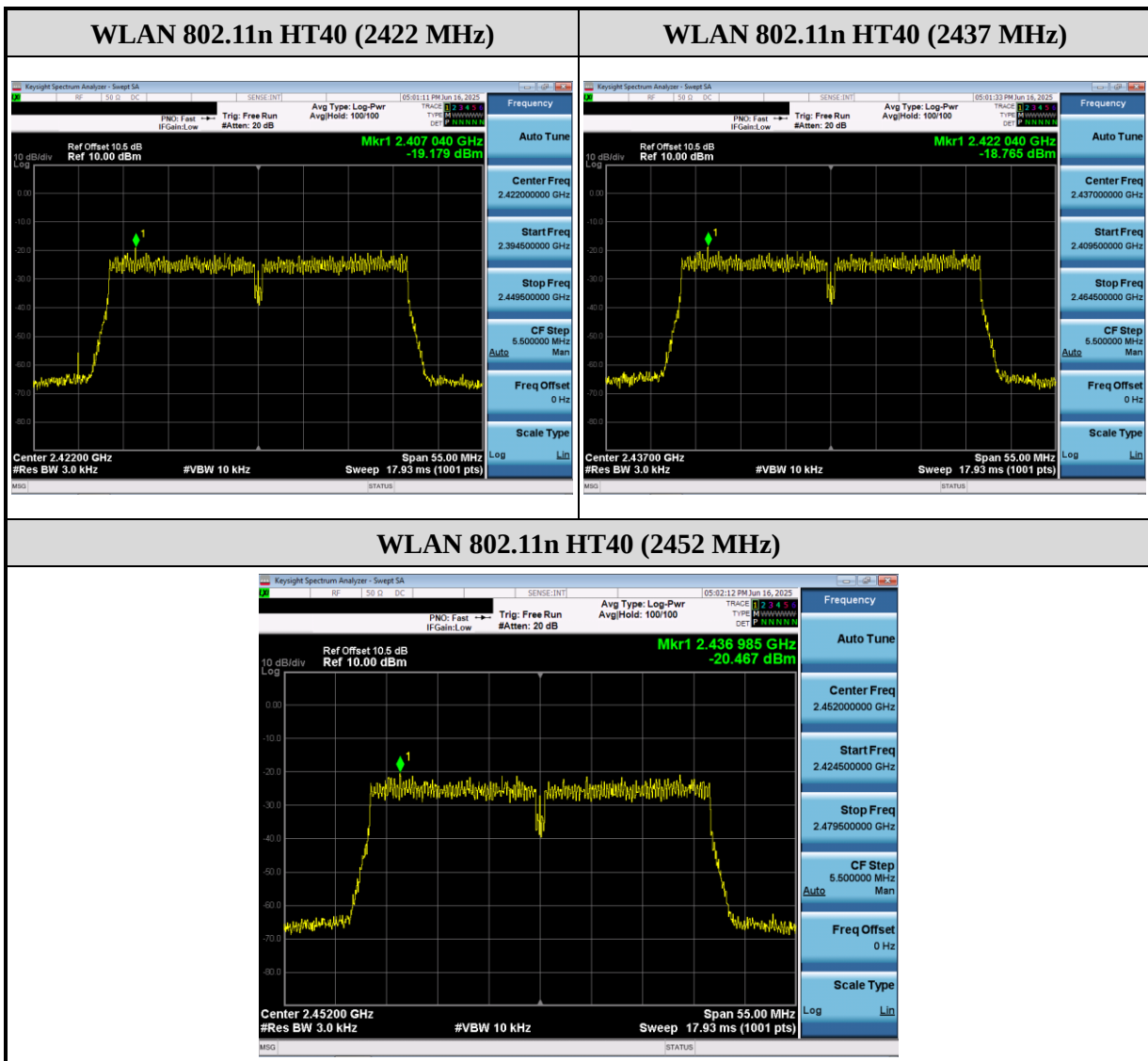
### 802.11n HT40

| Frequency (MHz) | Power Spectral Density (dBm) |         |       | Limit (dBm) | Result |
|-----------------|------------------------------|---------|-------|-------------|--------|
|                 | Chain A                      | Chain B | Total |             |        |
| 2422            | -19.179                      | --      | --    | $\leq 8$    | Pass   |
| 2437            | -18.765                      | --      | --    | $\leq 8$    | Pass   |
| 2452            | -20.467                      | --      | --    | $\leq 8$    | Pass   |

Remark:

1. PSD = Reading value on spectrum analyzer + cable loss
2. Section E) method 2) b) of power density measurement of KDB 662911 is used for calculating total power density.

### Chain A



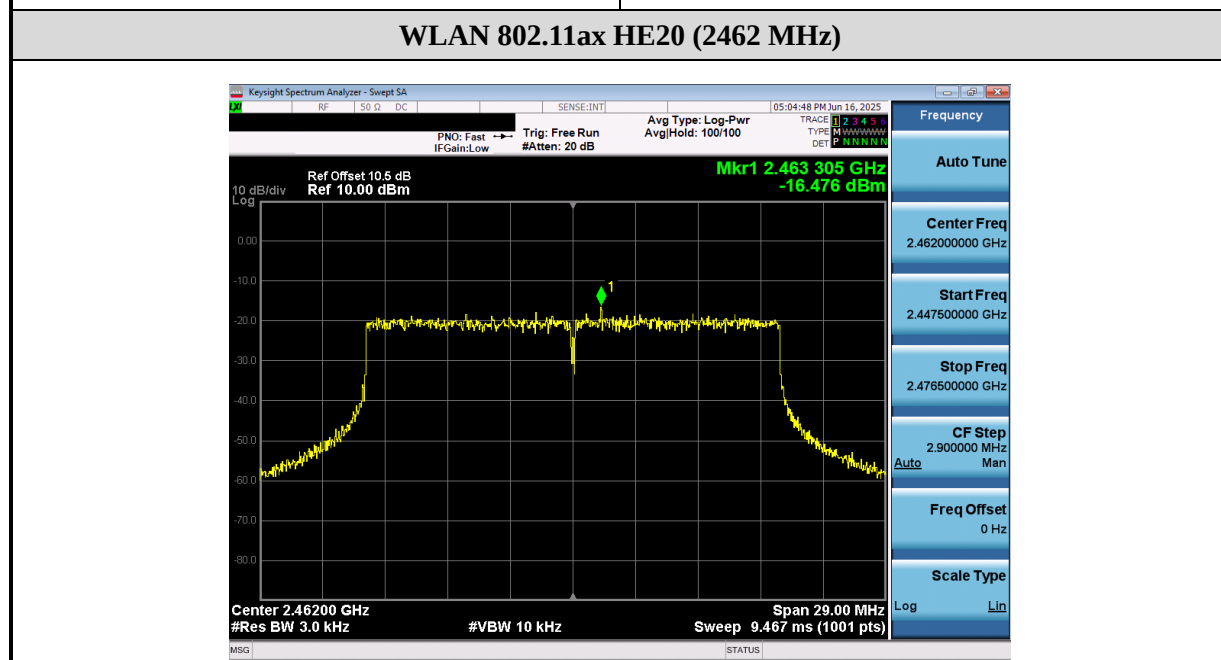
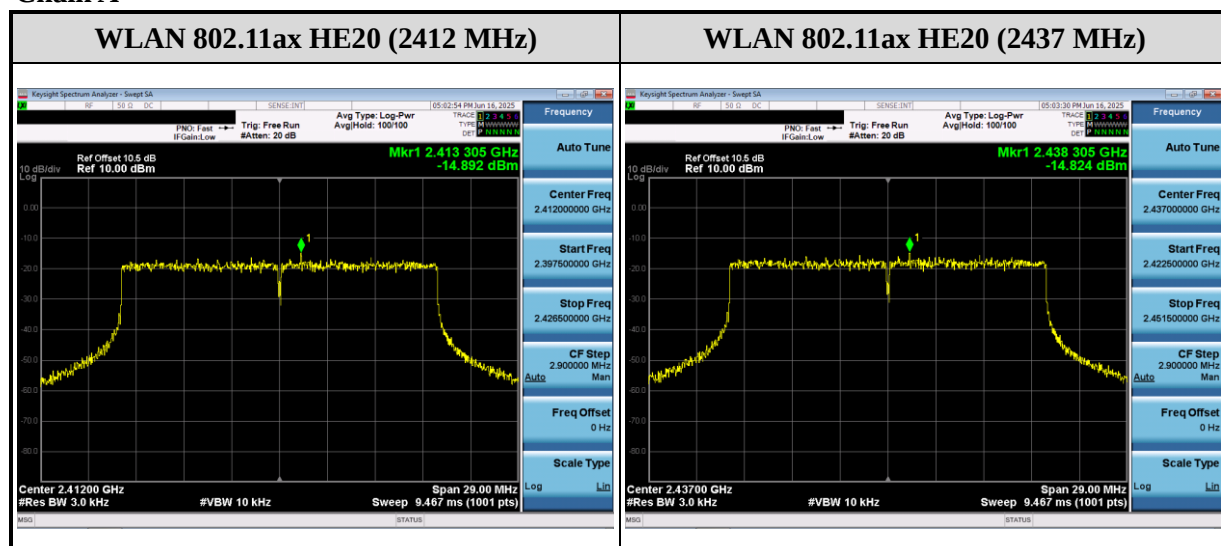
## 802.11ax HE20

| Channel | Frequency (MHz) | PSD (dBm) |         |       | Limit (dBm) | Result |
|---------|-----------------|-----------|---------|-------|-------------|--------|
|         |                 | Chain A   | Chain B | Total |             |        |
| 1       | 2412            | -14.892   | --      | --    | $\leq 8$    | Pass   |
| 6       | 2437            | -14.824   | --      | --    | $\leq 8$    | Pass   |
| 11      | 2462            | -16.476   | --      | --    | $\leq 8$    | Pass   |

Remark:

1. PSD = Reading value on spectrum analyzer + cable loss
2. Section E) method 2) b) of power density measurement of KDB 662911 is used for calculating total power density.

## Chain A



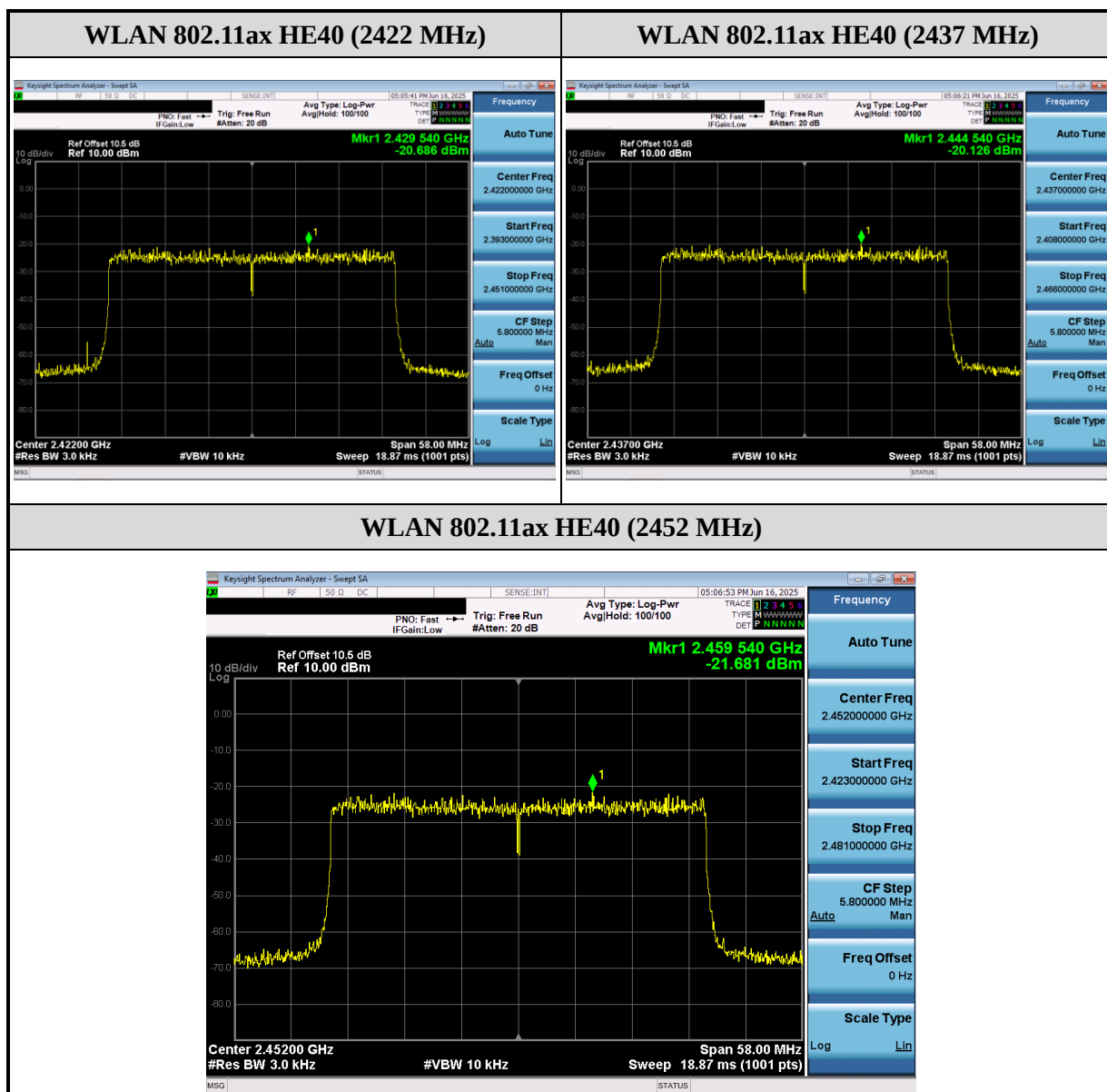
### 802.11ax HE40

| Channel | Frequency (MHz) | PSD (dBm) |         |       | Limit (dBm) | Result |
|---------|-----------------|-----------|---------|-------|-------------|--------|
|         |                 | Chain A   | Chain B | Total |             |        |
| 3       | 2422            | -20.686   | --      | --    | $\leq 8$    | Pass   |
| 6       | 2437            | -20.126   | --      | --    | $\leq 8$    | Pass   |
| 9       | 2452            | -21.681   | --      | --    | $\leq 8$    | Pass   |

Remark:

1. PSD = Reading value on spectrum analyzer + cable loss
2. Section E) method 2) b) of power density measurement of KDB 662911 is used for calculating total power density.

### Chain A



## 2.5 Conducted Band Edges and Spurious Emission Measurement

### 2.5.1 Limit

In any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in must also comply with the radiated emission limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB

### 2.5.2 Test Setup

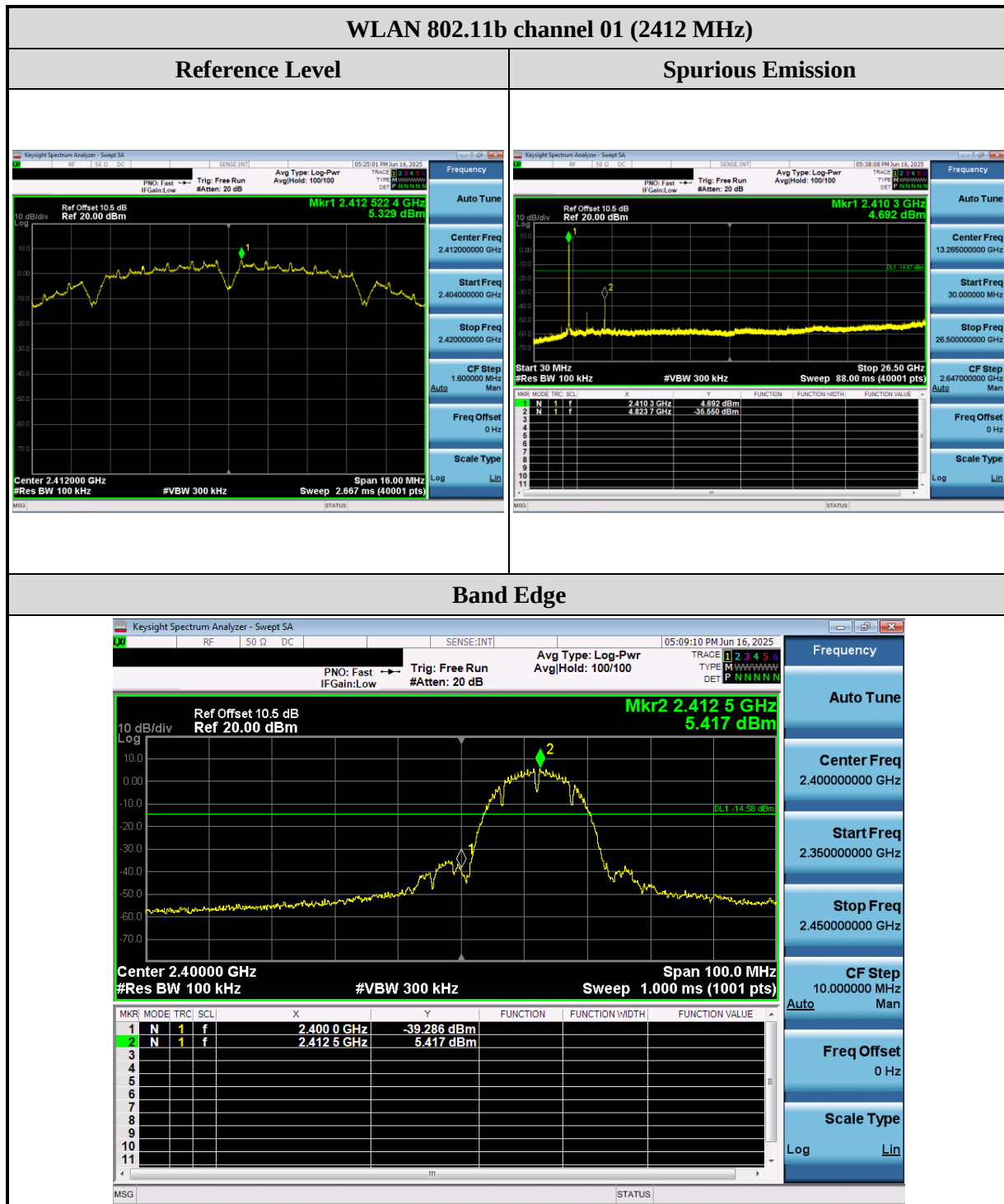


### 2.5.3 Test Procedure

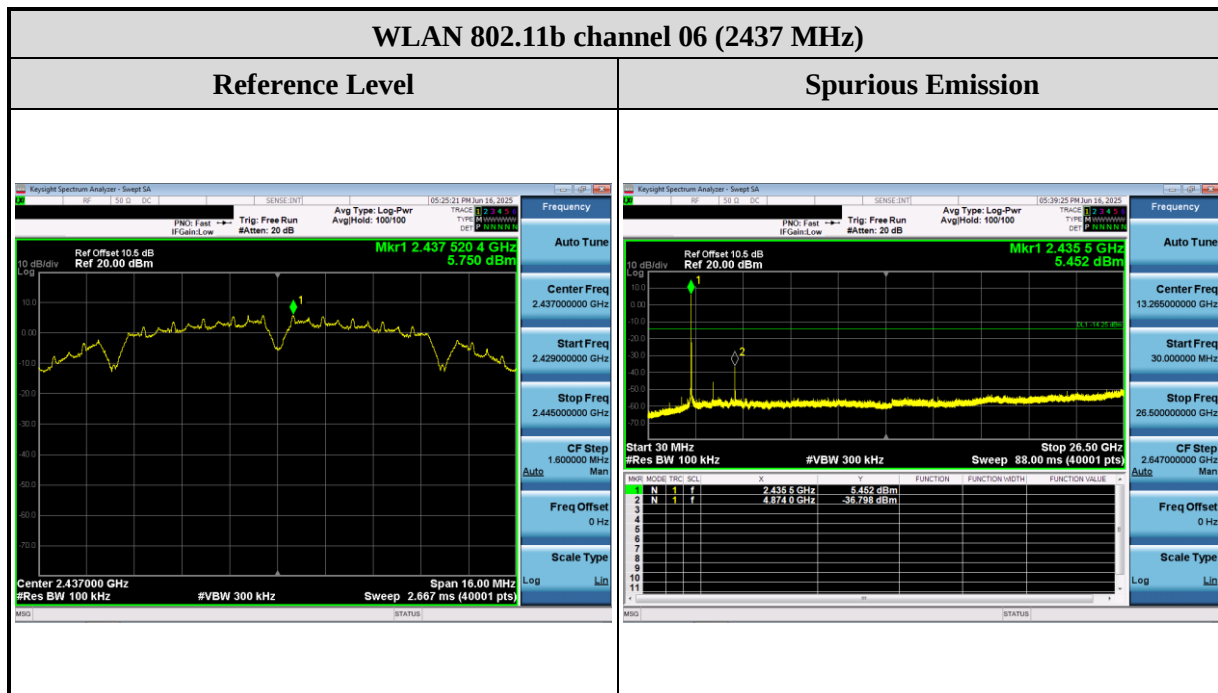
1. Reference ANSI C63.10 : 2013 chapter 6.10
2. Enable the EUT transmit continuously.
3. Spectrum analyzer set :
  - a) RBW = 100 kHz
  - b) VBW  $\geq$  3 RBW
  - c) Detector = peak
  - d) Sweep time = auto couple
  - e) Trace mode = max hold.

## 2.5.4 Test Result

### Chain A



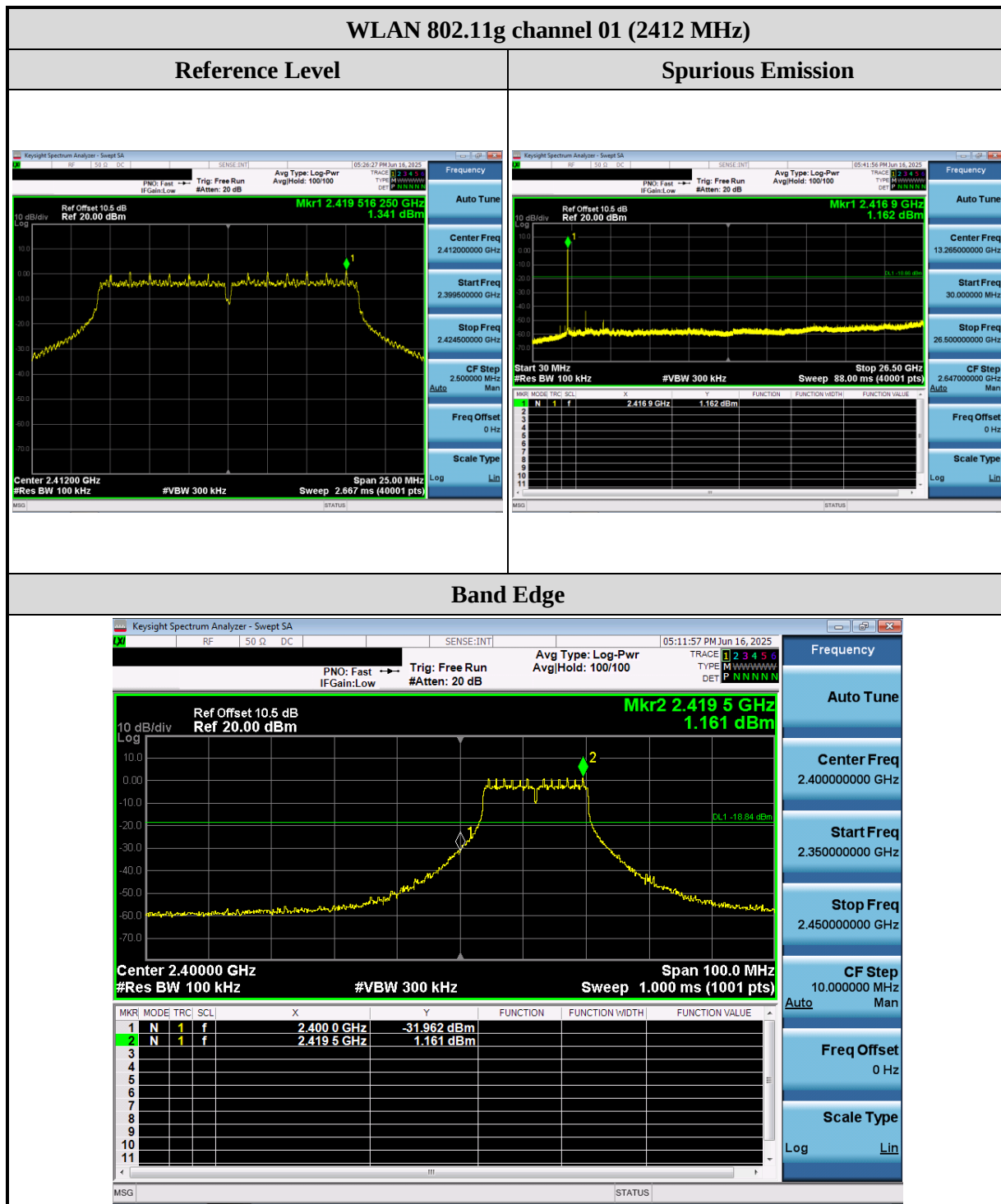
## Chain A



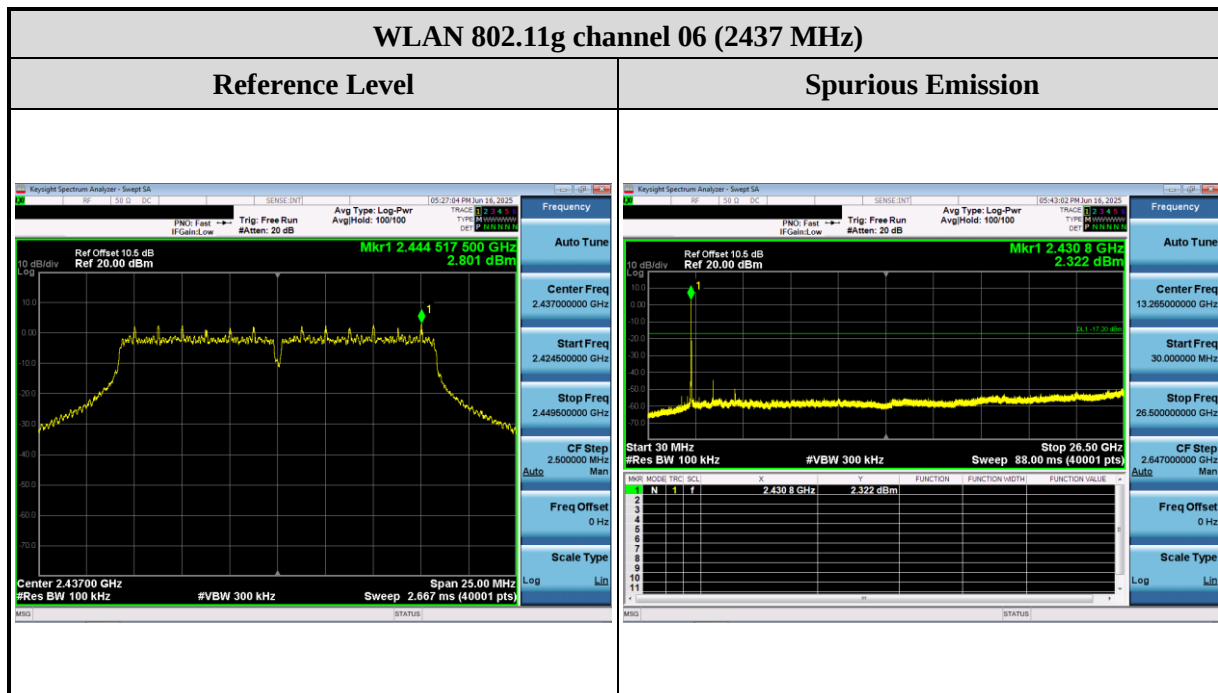
## Chain A



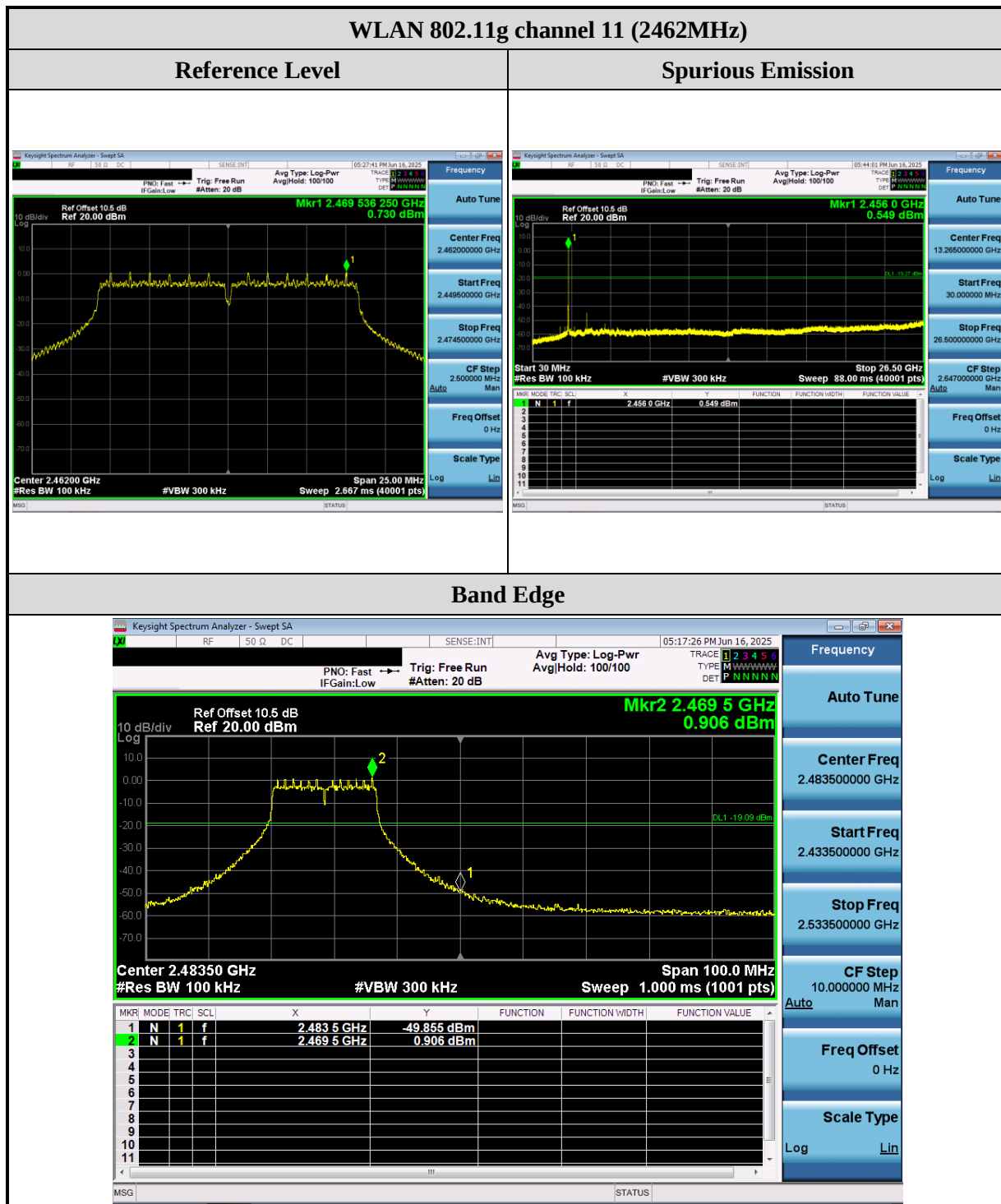
## Chain A



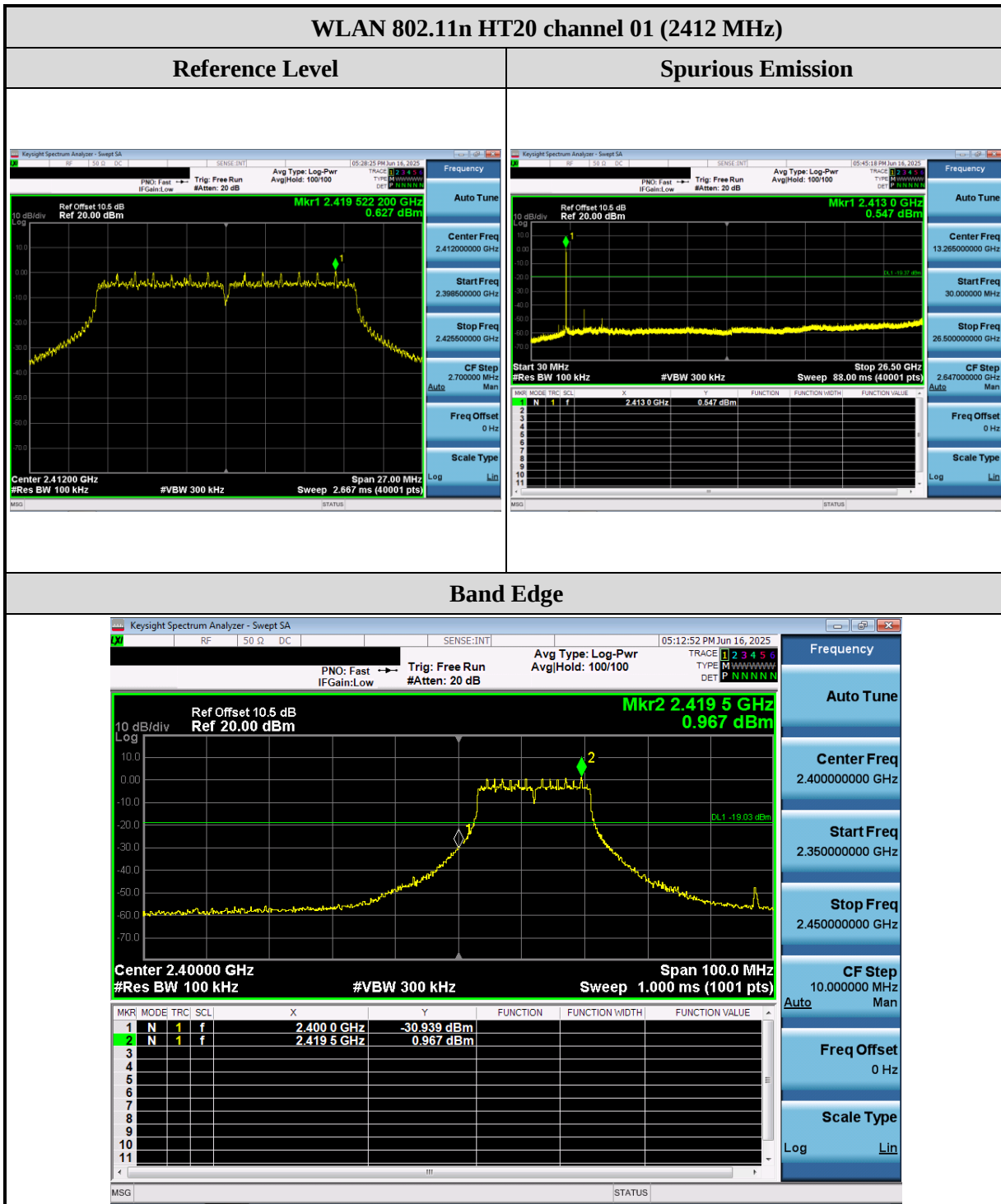
## Chain A



## Chain A



## Chain A



## Chain A

