

FCC 47 CFR PART 15 SUBPART C CERTIFICATION TEST REPORT

For

IP Indoor Monitor

MODEL NUMBER: DHI-VTH5421HB-W

ADDTIONAL MODEL NUMBER: VTH5421HB-W; DHI-VTH5421HB-W-USA;

DHI-VTH5421HW-W; VTH5421HW-W; DHI-VTH5421HW-W-USA

PROJECT NUMBER: 4790254061-4

REPORT NUMBER: 4790254061-4-3

FCC ID: SVN-VTH5421HBW

ISSUE DATE: Jan 26, 2022

Prepared for

Zhejiang Dahua Vision Technology Co., Ltd.

Prepared by

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Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|------------|---------------|------------|
| V0 | 01/26/2022 | Initial Issue | |



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.

Address: No.1199, Bin'an road, Binjiang District, Hangzhou,

P.R.China.

Manufacturer Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.

Address: No.1199, Bin'an road, Binjiang District, Hangzhou,

P.R.China.

Factory Information

Company Name: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD

Address: No.1199, Bin'an road, Binjiang District, Hangzhou,

P.R.China.

Company Name: ZHEJIANG DAHUA ZHILIAN CO.,LTD.

Address: No.28, Donggiao Road, Dongzhou Street, Fuyang District,

Hangzhou, P.R. China.

EUT Description

Product Name IP Indoor Monitor Model Name DHI-VTH5421HB-W

Additional No. VTH5421HB-W; DHI-VTH5421HB-W-USA; DHI-VTH5421HW-W;

VTH5421HW-W; DHI-VTH5421HW-W-USA

Sample Number 4587242
Data of Receipt Sample Jan 17, 2021

Date Tested Jan 17, 2021 ~ Jan 25, 2021

APPLICABLE STANDARDS

STANDARD TEST RESULTS

CFR 47 Part 15 Subpart C PASS



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| | Summary of Test Results | | | | | | |
|--------|--|--|--------------|--|--|--|--|
| Clause | Test Items | FCC Rules | Test Results | | | | |
| 1 | 6db DTS Bandwidth | FCC 15.247 (a) (2) | Complied | | | | |
| 2 | Conducted Power | FCC 15.247 (b) (3) | Complied | | | | |
| 3 | Power Spectral Density | FCC 15.247 (e) | Complied | | | | |
| 4 | Conducted Band edge And Spurious emission | FCC 15.247 (d) | Complied | | | | |
| 5 | Radiated Band edges and Spurious emission | FCC 15.247 (d) FCC 15.209 FCC 15.205 | Complied | | | | |
| 6 | Conducted Emission Test For AC Power Port | FCC 15.207 | Complied | | | | |
| 7 | Antenna Requirement | FCC 15.203 | Complied | | | | |

Remark:

| Prepared By: | Reviewed By: | | |
|----------------------------------|------------------------------------|--|--|
| Tom Tang | Leon Wu | | |
| Tom Tang Project Engineer | Leon Wu Senior Project Engineer | | |
| Authorized By: | | | |
| Chris Zhong. | | | |
| Chris Zhong Laboratory Leader | | | |

¹⁾ The measurement result for the sample received is <Pass> according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15C> when <Accuracy Method> decision rule is applied.



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

| Accreditation Certificate | A2LA (Certificate No.: 4829.01) UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1247) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (IC Designation No.: 25056; CAB No.:CN0073) UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. |
|------------------------------|--|
|------------------------------|--|

Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.



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4. CALIBRATION AND UNCERTAINTY

MEASURING INSTRUMENT CALIBRATION 4.1.

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. **MEASUREMENT UNCERTAINTY**

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Item | Uncertainty |
|--|----------------------|
| Conduction emission | 3.1 |
| Radiation Emission test(include Fundamental emission) (9KHz-30MHz) | 3.4dB |
| Radiation Emission test(include Fundamental emission) (30MHz-1GHz) | 3.4dB |
| Radiation Emission test (1GHz to 26GHz)(include Fundamental emission) | 3.9dB (1GHz-18Gz) |
| Notes This was estaintened and amount of the standard of the s | 4.2dB (18GHz-26.5Gz) |

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



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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

| Product Name: | IP Indoor Monitor |
|----------------------------------|--|
| Model No.: | DHI-VTH5421HB-W |
| Operating Frequency: | IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz |
| Type of Modulation: | IEEE for 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE for 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Channels Step: | Channels with 5MHz step |
| Test software of EUT: | Secure CRT (manufacturer declare) |
| Antenna Type: | PCB antenna |
| Antenna Gain: Antenna1: 1.46 dBi | |
| | Remark: This data is provided by customer and our lab isn't responsible for this data |

Remark:

Model No.:

| Number: | Name: | Number: | Name: | Number: | Name: |
|---------|-----------------------|---------|-----------------------|---------|------------------|
| 1 | DHI-VTH5421HB-W | 2 | VTH5421HB-W | 3 | DHI-VTH5421HB-W- |
| | | | | | USA |
| 4 | DHI-VTH5421HW-W | 5 | VTH5421HW-W | 6 | DHI-VTH5421HW-W- |
| | 2111 11110 1211111 11 | | V 11.10 12 11 11 V 11 | | USA |

Only the main model **DHI-VTH5421HB-W** was tested and only the data of this model is shown in this test report. Since Their electrical circuit design, layout, components used and internal wiring are identical, only the name of the models.

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5.2. MAXIMUM OUTPUT POWER

| Number of Transmit Chains (NTX) | IEE Std. 802.11 | Channel Number | Max AV Conducted Power (dBm) |
|---------------------------------------|-------------------|----------------|------------------------------|
| 1 | IEEE 802.11B SISO | 1-11[11] | 14.12 |
| 1 | IEEE 802.11G SISO | 1-11[11] | 11.53 |
| 1 | IEEE 802.11nHT20 | 1-11[11] | 11.27 |
| 1 | IEEE 802.11nHT40 | 3-9[7] | 12.45 |

5.3. CHANNEL LIST

| | Channel List for 802.11b/g/n (20 MHz) | | | | | | |
|---------|---------------------------------------|---------|--------------------|---------|--------------------|---------|--------------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1 | 2412 | 4 | 2427 | 7 | 2442 | 10 | 2457 |
| 2 | 2417 | 5 | 2432 | 8 | 2447 | 11 | 2462 |
| 3 | 2422 | 6 | 2437 | 9 | 2452 | | |

| | Channel List for 802.11n (40 MHz) | | | | | | |
|---------|-----------------------------------|---------|--------------------|---------|--------------------|---------|--------------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 3 | 2422 | 5 | 2432 | 7 | 2442 | 9 | 2452 |
| 4 | 2427 | 6 | 2437 | 8 | 2447 | | |



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5.4. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency | | |
|-----------------------|-------------------|---------------------------|--|--|
| WiFi TX(802.11b) | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz | | |
| WiFi TX(802.11g) | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz | | |
| WiFi TX(802.11n HT20) | CH 1, CH 6, CH 11 | 2412MHz, 2437MHz, 2462MHz | | |
| WiFi TX(802.11n HT40) | CH 3, CH 6, CH 9 | 2422MHz, 2437MHz, 2452MHz | | |

5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band | | | | | | | |
|--|----------|------|-----------------------------------|--------|------------|------|------|
| Test Softw | vare | | Secure CRT (manufacturer declare) | | | | |
| | Transmit | | | Test C | t Channel | | |
| Modulation Mode | Antenna | | NCB: 20MHz | | NCB: 40MHz | | |
| WIOGC | Number | CH 1 | CH 6 | CH 11 | CH 3 | CH 6 | CH 9 |
| 802.11b | 1 | N/A | N/A | N/A | | | |
| 802.11g | 1 | N/A | N/A | N/A | | / | |
| 802.11n HT20 | 1 | N/A | N/A | N/A | | | |
| 802.11n HT40 | 1 | | / | | 45 | 45 | 45 |



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5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|------|-----------------|--------------|--------------------|
| 1 | 2400-2483.5 | PCB antenna | 1.46 |

| Test Mode | Transmit and Receive Mode | Description |
|---------------------|---------------------------|---|
| IEEE 802.11b | ⊠1TX, 1RX | Antenna1 can be used as transmitting/receiving antenna independently. |
| IEEE 802.11g | ⊠1TX, 1RX | Antenna1 can be used as transmitting/receiving antenna independently. |
| IEEE 802.11N (HT20) | ⊠1TX, 1RX | Antenna1 can be used as transmitting/receiving antenna independently. |
| IEEE 802.11N (HT40) | ⊠1TX, 1RX | Antenna1 can be used as transmitting/receiving antenna independently. |

5.7. THE WORSE CASE CONFIGURATIONS

For the product, there two transmission antennas, and pre-testing both of them, only the worse data for the antenna is recorded in the report.

Worst-case data rates as provided by the client were:

802.11b mode: 1 Mbps 802.11g mode: 6 Mbps 802.11n HT20 mode: MCS0 802.11n HT40 mode: MCS0

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5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name | Description |
|------|-----------------|------------|----------------|--------------------|
| 1 | Laptop | ThinkPad | E590 | N/A |
| 2 | SD Card | N/A | N/A | Supply by UL Lab |
| 3 | Outdoor Station | DAHUA | DHI-VTO1210C-X | Supply by Customer |
| 4 | Led Lighting | Kbaoele | LTE-1101 | Supply by UL Lab |
| 5 | Fixed frequency | N/A | N/A | Supply by Customer |

I/O PORT

| Cable No | Port | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|------|----------------|------------|-----------------|---------|
| 1 | USB | USB to TTL | USB | 100cm Length | N/A |

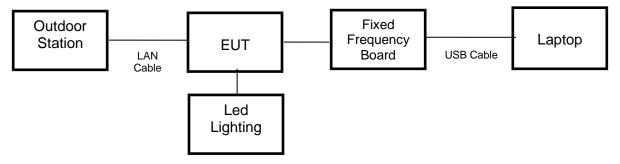
ACCESSORY

| Item | Accessory | Brand Name | Model Name | Description |
|------|------------|------------|---------------------------|---|
| 1 | AC Adapter | AC POWER | ADS-12AM-12 12012-EPCU | INPUT:100-240V,50/60Hz, 0.3A OUTPUT:12V 1A |

TEST SETUP

The EUT can work in an engineer mode with a software through a table PC.

SETUP DIAGRAM FOR TESTS



Remark: The EUT has been built one SD card during the testing



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5.9. MEASURING INSTRUMENT AND SOFTWARE USED

| | Conducted Emissions (Instrument) | | | | | | | |
|-------------------------|----------------------------------|----------------------------------|-------------------------------------|-------------|------------|--------------------|------------|------------|
| Llood | Equipment | | | | , | Upper Last | Loot Col | Novt Col |
| Used | Equipment | Manufacturer | Model | | Serial No. | Cal. | Last Cal. | Next Cal. |
| $\overline{\mathbf{V}}$ | EMI Test Receiver | R&S | ESR3 | | 126700 | 2020-12-05 | 2021-12-04 | 2022-12-03 |
| | Two-Line V- Network | R&S | ENV2 | 16 | 126701 | 2020-12-05 | 2021-12-04 | 2022-12-03 |
| | | | | Soft | ware | | | |
| Used | Des | cription | | Ma | nufacturer | Name | Version | |
| | Test Software for C | Conducted distu | ırbance | | R&S | EMC32 | Ver. 9.25 | |
| | Radiated Emissions (Instrument) | | | | | | | |
| Used | Equipment | Manufacturer | Model | No. | Serial No. | Upper Last Cal. | Last Cal. | Next Cal. |
| $\overline{\mathbf{V}}$ | Spectrum Analyzer | Keysight | N901 | | 155727 | 2020-05-10 | 2021-05-09 | 2022-05-08 |
| \square | EMI test receiver | R&S | ESR | 26 | 126703 | 2020-12-05 | 2021-12-04 | 2022-12-03 |
| V | Receiver Antenna (9kHz-30MHz) | Schwarzbeck | FMZB ² | 1513 | 155456 | 2018-06-15 | 2021-06-03 | 2024-06-02 |
| \checkmark | Receiver Antenna (30MHz-1GHz) | SunAR RF Motion | JB1 | l | 177821 | N/A | 2019-01-28 | 2022-01-27 |
| | Receiver Antenna (1GHz-18GHz) | R&S | HF90 | 07 | 126705 | 2018-01-29 | 2019-01-28 | 2022-01-27 |
| | Receiver Antenna (1GHz-18GHz) | Schwarzbeck | BBHA9 | 120D | 155392 | 2018-06-20 | 2021-06-07 | 2024-06-06 |
| \ | Pre-amplification (To 18GHz) | Compliance Direction System Inc. | PAP-10 50 | | 177825 | 2019-03-18 | 2020-12-05 | 2022-03-25 |
| | Pre-amplification (To 26.5GHz) | R&S | SCU-2 | 26D | 135391 | 2020-12-05 | 2021-12-04 | 2022-12-03 |
| V | Band Reject Filter | Wainwright | WRCJ 2350-24 2483 2533.5-4 | 400- .5- | 1 | 2020-05-10 | 2021-05-09 | 2022-05-08 |
| V | Highpass Filter | Wainwright | WHKX 2700-3 18000-4 | 000- | 2 | 2020-05-10 | 2021-05-09 | 2022-05-08 |
| | Software | | | | | | | |
| Used | Descr | escription Manufa | | | turer | Name | Version | |
| V | | | | | | | | |
| | Other instruments | | | | | | | |
| Used | Equipment | Manufacturer | Model | No. | Serial No. | Upper Last Cal. | Last Cal. | Next Cal. |
| V | Spectrum Analyzer | Keysight | N901 | 0B | 155368 | 2020-05-10 | 2021-05-09 | 2022-05-08 |
| | Power Meter | Keysight | U2021 | XA | 155370 | 2020-05-10 | 2021-05-09 | 2022-05-08 |



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6. MEASUREMENT METHODS

| No. | Test Item | KDB Name | Section |
|-----|---|---|---------------------------|
| 1 | 6dB Bandwidth | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.2 |
| 2 | Conducted Output Power | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.3.2.3 (Method AVGPM) |
| 3 | Power Spectral Density | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.4 (Method PKPSD) |
| 4 | Out-of-band emissions in non-restricted bands | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.5 |
| 5 | Out-of-band emissions in restricted bands | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.6 |
| 6 | Band-edge | KDB 558074 D01 15.247 Meas Guidance v05r02 | 8.7 |
| 7 | Conducted Emission Test For AC Power Port | ANSI C63.10-2013 | 6.2 |



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7. ANTENNA PORT TEST RESULTS

7.1. TEST ENVIRONMENT

| Environment Parameter | Selected Values During Tests |
|-----------------------|------------------------------|
| Relative Humidity | 53.8% |
| Atmospheric Pressure: | 102.5kPa |
| Temperature | 19.7°C |



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7.2. ON TIME AND DUTY CYCLE

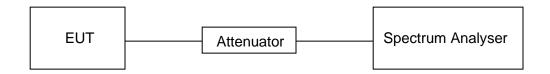
LIMITS

None; for reporting purposes only

PROCEDURE

FCC KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

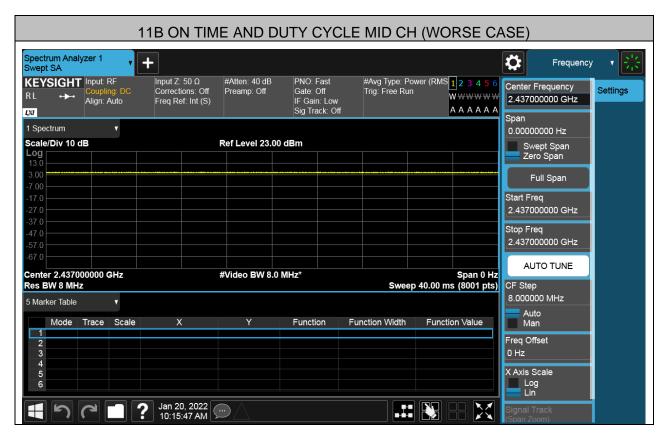
| Mode | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) | 1/T Minimum VBW (KHz) |
|-------------|----------------------|------------------|--------------------------------|----------------------|--|--------------------------------|
| 11B | 100 | 100 | 1 | 100 | 0 | 0.01 |
| 11G | 100 | 100 | 1 | 100 | 0 | 0.01 |
| 11N HT20 | 100 | 100 | 1 | 100 | 0 | 0.01 |
| 11N HT40 | 100 | 100 | 1 | 100 | 0 | 0.01 |

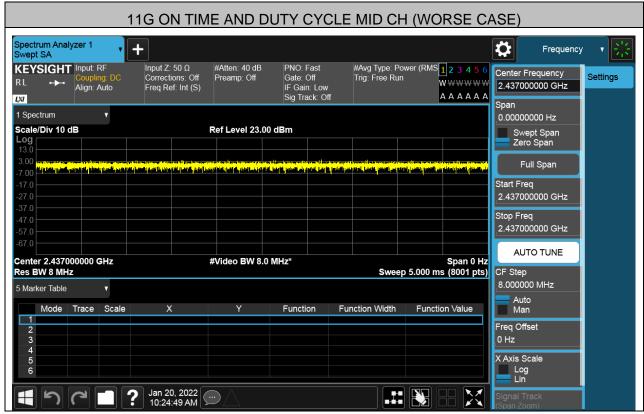
Note: 1) Duty Cycle Correction Factor=10log(1/x).

2) Where: x is Duty Cycle(Linear)

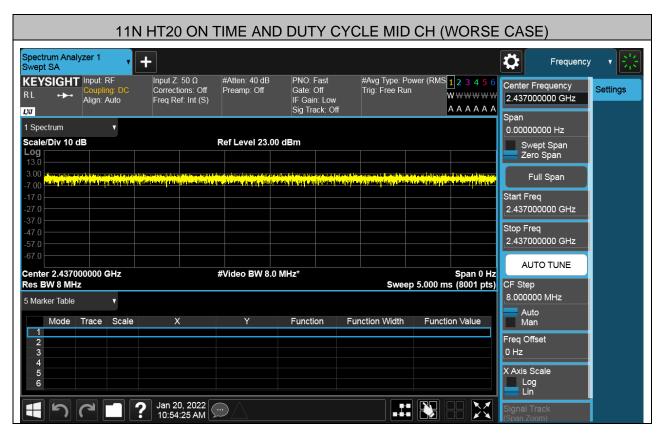
3) Where: T is On Time (transmit duration)

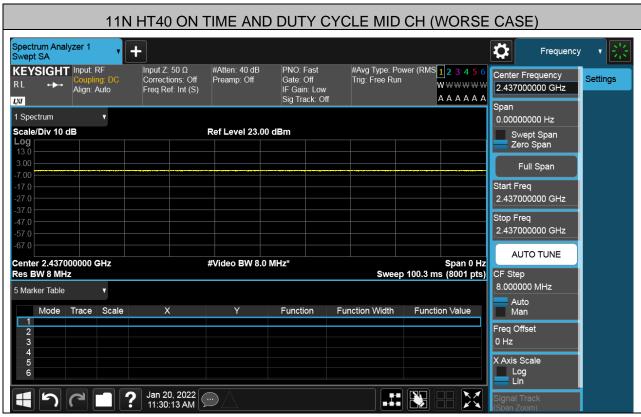














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7.3. 6 dB BANDWIDTH

LIMITS

| FCC Part15 (15.247) Subpart C | | | | | |
|-------------------------------|---------------|-----------|--------------------------|--|--|
| Section | Test Item | Limit | Frequency Range (MHz) | | |
| FCC 15.247(a)(2) | 6dB Bandwidth | >= 500KHz | 2400-2483.5 | | |

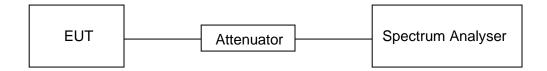
TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyzer and use the following settings:

| Center Frequency | The centre frequency of the channel under test |
|------------------|--|
| Detector | Peak |
| RBW | For 6dB Bandwidth :100K |
| VBW | For 6dB Bandwidth : ≥3 × RBW |
| Trace | Max hold |
| Sweep | Auto couple |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP





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RESULTS

| Test Mode | Test Channel | 6dB bandwidth (MHz) | Result |
|-----------|--------------|------------------------|--------|
| | LCH | 9.078 | Pass |
| 11B | MCH | 9.048 | Pass |
| | HCH | 9.045 | Pass |
| 11G | LCH | 16.57 | Pass |
| | MCH | 16.55 | Pass |
| | HCH | 16.57 | Pass |
| | LCH | 17.70 | Pass |
| 11N HT20 | MCH | 17.71 | Pass |
| | HCH | 17.72 | Pass |
| 11N HT40 | LCH | 36.50 | Pass |
| | MCH | 36.44 | Pass |
| | HCH | 36.46 | Pass |



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<u>Test Graphs</u>

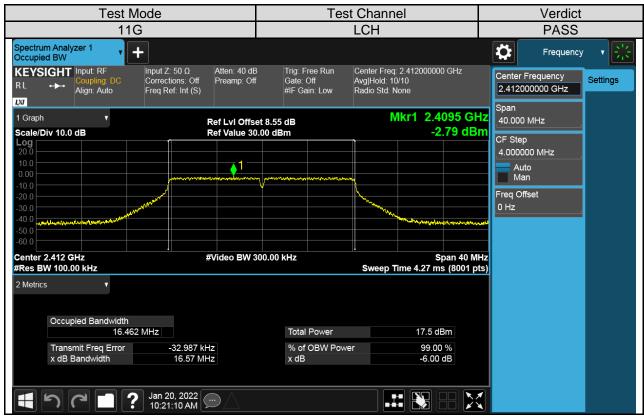
For 6dB Bandwidth part:



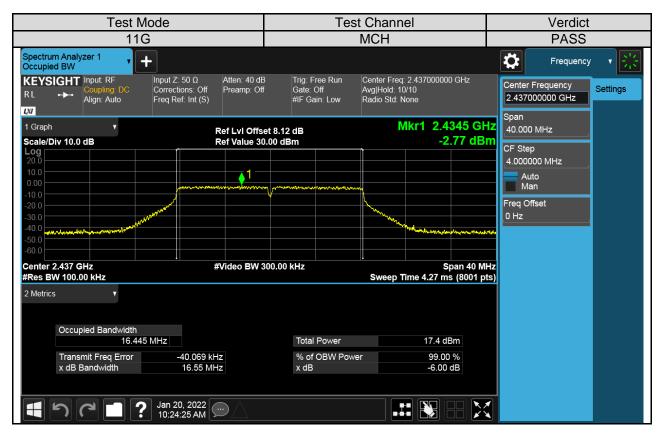






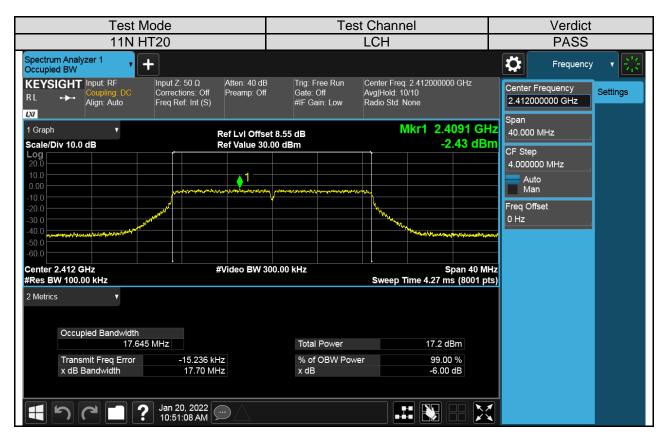


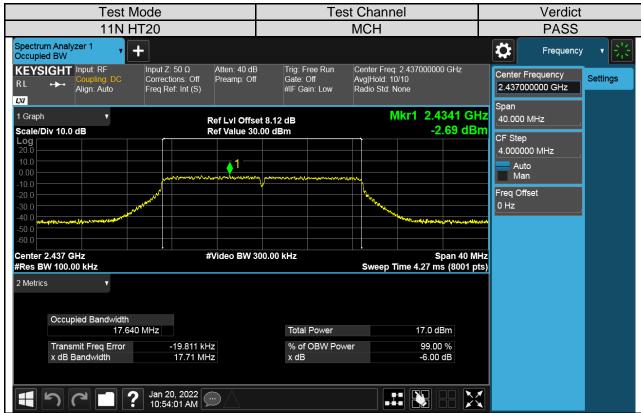






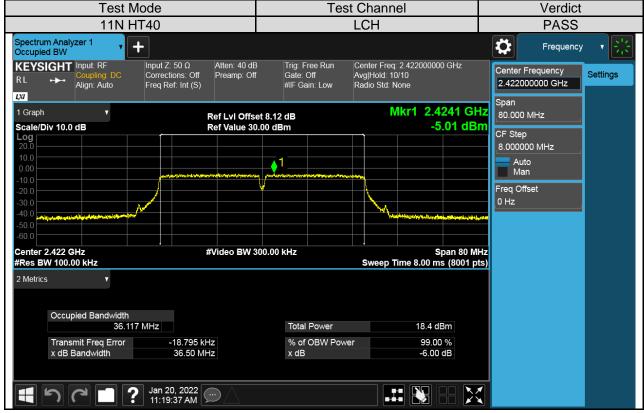




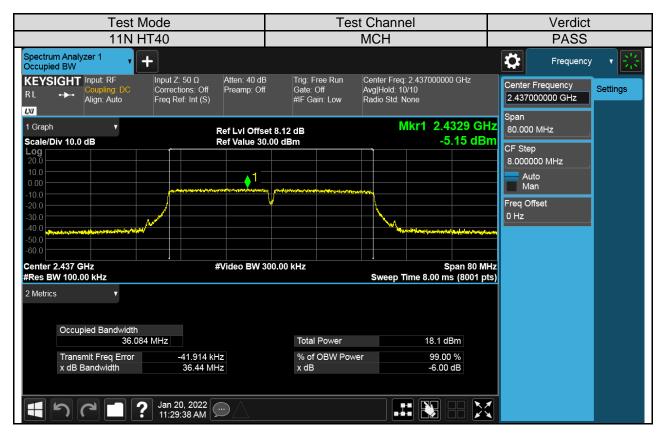


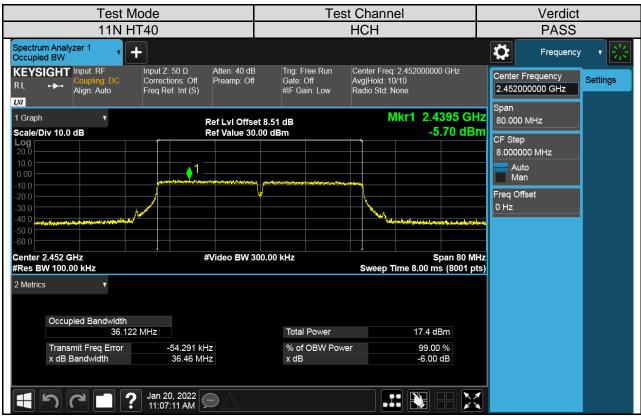












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7.4. CONDUCTED POWER

LIMITS

| FCC Part15 (15.247) Subpart C | | | |
|-------------------------------|--------------|-----------------|--------------------------|
| Section | Test Item | Limit | Frequency Range (MHz) |
| FCC 15.247(b)(3) | Output Power | 1 watt or 30dBm | 2400-2483.5 |

TEST PROCEDURE

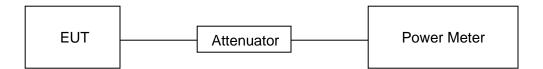
Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power Meter.

Measure the power of each channel.

AVG Detector use for AVG result.

TEST SETUP





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RESULTS

| Test Mode | Test Channel | Maximum Conducted Output Power (AV) | Result |
|-----------|--------------|-------------------------------------|--------|
| | | dBm | |
| | LCH | 14.12 | Pass |
| 11B | MCH | 14.09 | Pass |
| | HCH | 13.55 | Pass |
| 11G | LCH | 11.53 | Pass |
| | MCH | 11.38 | Pass |
| | HCH | 10.86 | Pass |
| | LCH | 11.27 | Pass |
| 11N HT20 | MCH | 11.01 | Pass |
| | HCH | 10.63 | Pass |
| 11N HT40 | LCH | 12.45 | Pass |
| | MCH | 12.09 | Pass |
| | HCH | 11.17 | Pass |

Remark:

- For all the test results has been adjusted the duty cycle factor.
 For Correction Factor is refer to the result in section 7.2
- 3) For all test data are have adjusted with cable loss factor.

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7.5. POWER SPECTRAL DENSITY

LIMITS

| FCC Part15 (15.247) Subpart C | | | |
|-------------------------------|---------------------------|----------------------------|--------------------------|
| Section | Test Item | Limit | Frequency Range (MHz) |
| FCC §15.247 (e) | Power Spectral Density | 8 dBm in any 3 kHz band | 2400-2483.5 |

TEST PROCEDURE

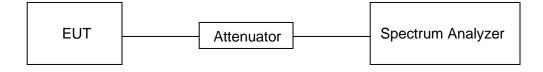
Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following settings:

| Center Frequency | The centre frequency of the channel under test |
|------------------|--|
| Detector | Peak |
| RBW | 3 kHz ≤ RBW ≤100 kHz |
| VBW | ≥3 × RBW |
| Span | 1.5 x DTS bandwidth |
| Trace | Max hold |
| Sweep time | Auto couple. |

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP





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RESULTS

| Test Mode | Test Channel | Maximum Peak power spectral density (dBm/30kHz) | Result |
|-----------|--------------|--|--------|
| | LCH | -0.34 | Pass |
| 11B | MCH | -0.22 | Pass |
| | HCH | -0.80 | Pass |
| | LCH | -5.54 | Pass |
| 11G | MCH | -5.76 | Pass |
| | HCH | -6.40 | Pass |
| | LCH | -5.29 | Pass |
| 11N HT20 | MCH | -5.38 | Pass |
| | HCH | -5.92 | Pass |
| 11N HT40 | LCH | -7.83 | Pass |
| | MCH | -7.73 | Pass |
| | HCH | -8.91 | Pass |



Test Graphs:



| Test Mode | Test Channel | Verdict |
|-----------|--------------|---------|
| 11B | MCH | PASS |

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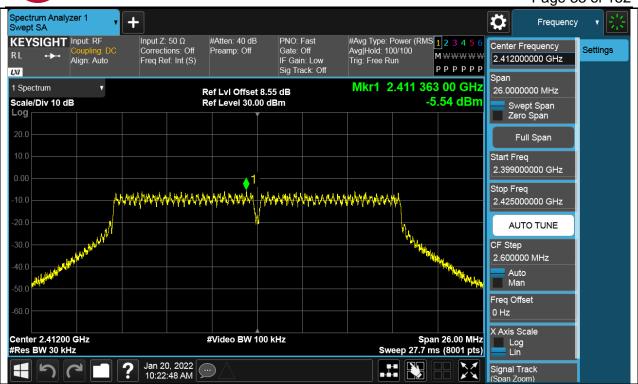




| Test Mode | Test Channel | Verdict |
|-----------|--------------|---------|
| 11G | LCH | PASS |



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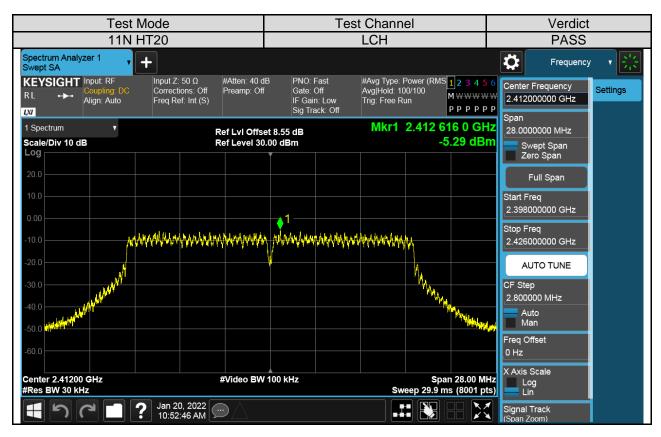






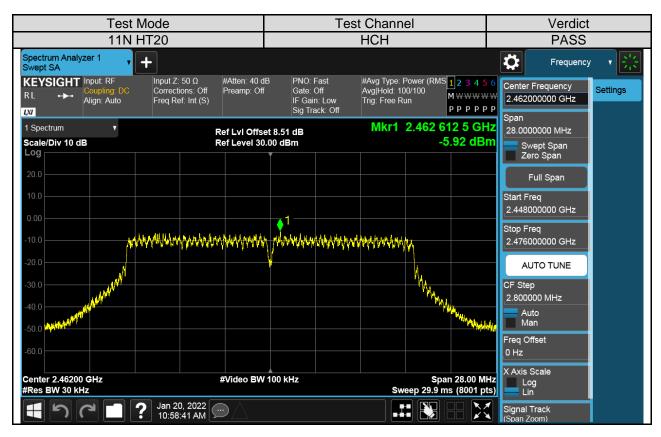






















7.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

| FCC Part15 (15.247) Subpart C | | | |
|---|--|--|--|
| Section Test Item Limit | | | |
| Conducted Bandedge and Spurious Emissions Conducted Bandedge and Spurious Emissions At least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power | | | |

TEST PROCEDURE

Refer to FCC KDB 558074, connect the UUT to the spectrum analyser and use the following

| Center Frequency | The centre frequency of the channel under test |
|------------------|--|
| Detector | Peak |
| RBW | 100K |
| VBW | ≥3 × RBW |
| Span | 1.5 x DTS bandwidth |
| Trace | Max hold |
| Sweep time | Auto couple. |

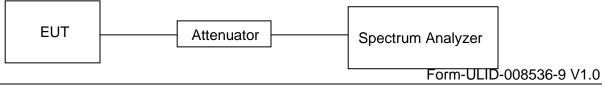
settings:

Use the peak marker function to determine the maximum PSD level.

| Span | Set the center frequency and span to encompass frequency range to be measured |
|--------------------|---|
| Detector | Peak |
| RBW | 100K |
| VBW | ≥3 × RBW |
| measurement points | ≥span/RBW |
| Trace | Max hold |
| Sweep time | Auto couple. |

Use the peak marker function to determine the maximum amplitude level.

TEST SETUP





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Part I : Conducted Bandedge

RESULTS TABLE

| Test Mode | Test Antenna | Test Channel | Test Result | Verdict |
|-----------|--------------|--------------|---------------------|---------|
| 44D | Antonno 1 | LCH | See the test graphs | PASS |
| 11B | Antenna 1 | HCH | See the test graphs | PASS |
| 440 | Antenna 1 | LCH | See the test graphs | PASS |
| 11G | | HCH | See the test graphs | PASS |
| 44N UT20 | Antonno 1 | LCH | See the test graphs | PASS |
| 11N HT20 | Antenna 1 | HCH | See the test graphs | PASS |
| 44N UT40 | Antonno 1 | LCH | See the test graphs | PASS |
| 11N HT40 | Antenna 1 | HCH | See the test graphs | PASS |

TEST GRAPHS

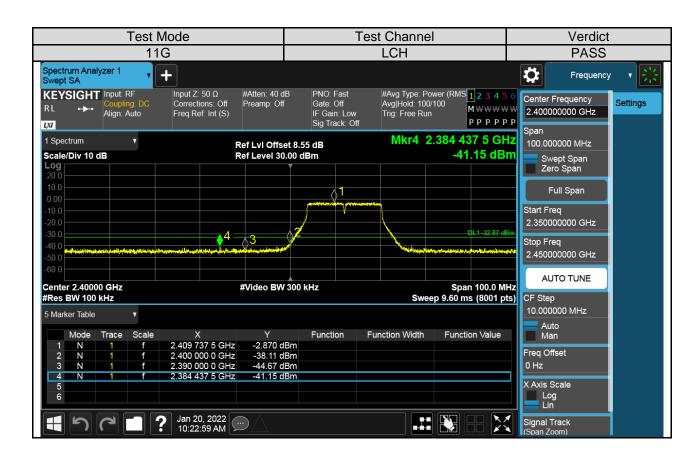


| Test Mode | Test Channel | Verdict |
|-----------|--------------|---------|
| 11B | HCH | PASS |



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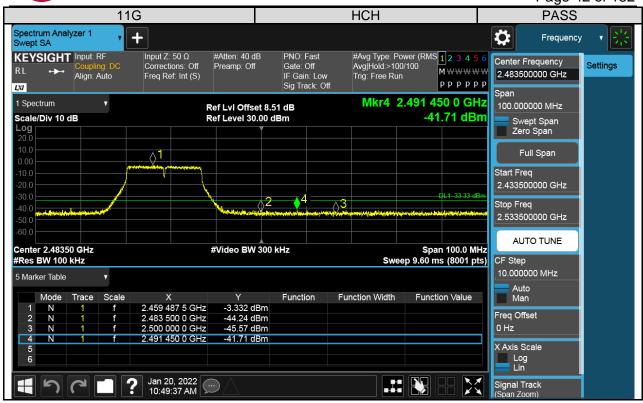


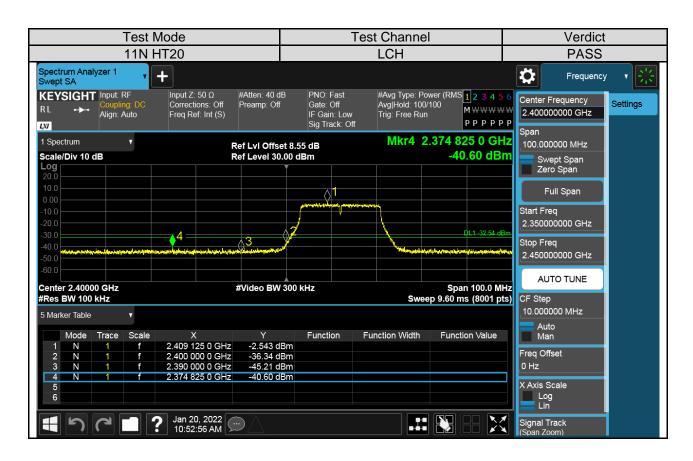


Test Mode Test Channel Verdict



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Form-ULID-008536-9 V1.0



Test Mode Test Channel Verdict 11N HT40 HCH PASS Spectrum Analyzer 1 Ö Frequency wept SA Input Z: 50 Ω Corrections: Off Freq Ref: Int (S) #Avg Type: Power (RMS 1 2 3 4 5 6 Avg|Hold:>100/100 MWWWWWW #Atten: 40 dB KEYSIGHT Input: RF PNO: Fast Center Frequency Settings Preamp: Off Gate: Off Align: Auto 2.483500000 GHz IF Gain: Low PPPPPP LΧΙ Mkr4 2.496 712 5 GHz 1 Spectrum 100.000000 MHz Ref Lvl Offset 8.51 dB -40.85 dBm Scale/Div 10 dB Ref Level 30.00 dBm Swept Span Zero Span Full Span 0.00 Start Freq 2.433500000 GHz 2.533500000 GHz AUTO TUNE Center 2.48350 GHz #Res BW 100 kHz Span 100.0 MHz Sweep 9.60 ms (8001 pts) #Video BW 300 kHz CF Step 10.000000 MHz 5 Marker Table Auto Man Scale Function Function Width Function ∀alue 2.435 375 0 GHz -5.728 dBm Freq Offset 2.483 500 0 GHz 2.500 000 0 GHz -43.76 dBm -42.94 dBm Ν 0 Hz Ν 2.496 712 5 GHz -40.85 dBm X Axis Scale 5 6 Log Lin Jan 20, 2022 11:09:07 AM X Signal Track



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Part II : Conducted Emission

Test Result Table

| Test Mode | Test Antenna | Channel | Pref(dBm) | Puw(dBm) | Verdict |
|-----------|--------------|---------|---------------------|--------------------------------------|---------|
| | | LCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| 11B SISO | Antenna 1 | MCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | HCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | LCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| 11G SISO | Antenna 1 | MCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | HCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | LCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| 11N HT20 | Antenna 1 | MCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | HCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | LCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| 11N HT40 | Antenna 1 | MCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |
| | | HCH | See the test graphs | <limit< td=""><td>PASS</td></limit<> | PASS |



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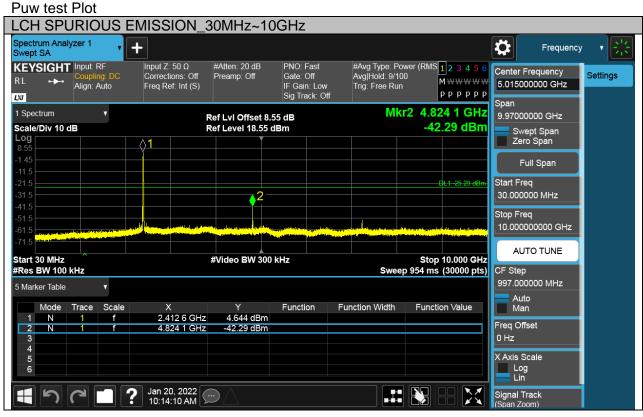
Test Plots

| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B | LCH | PASS |





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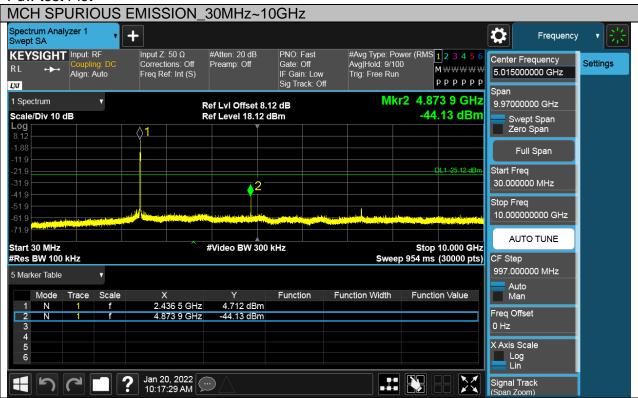
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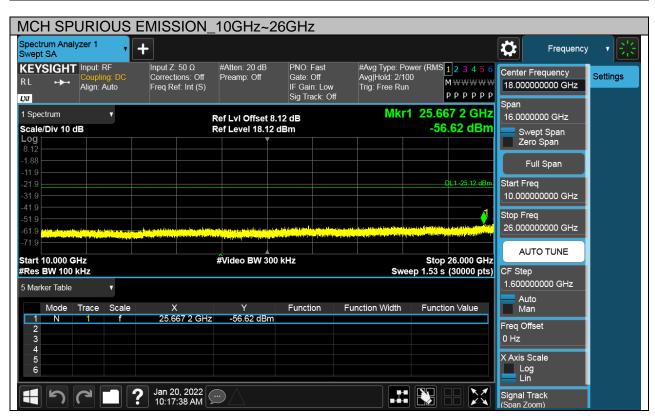
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B | MCH | PASS |





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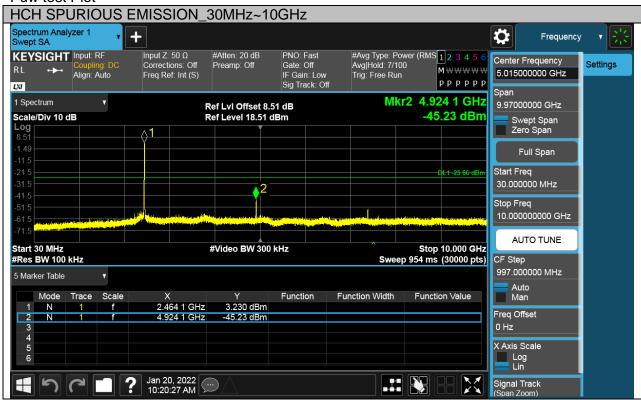
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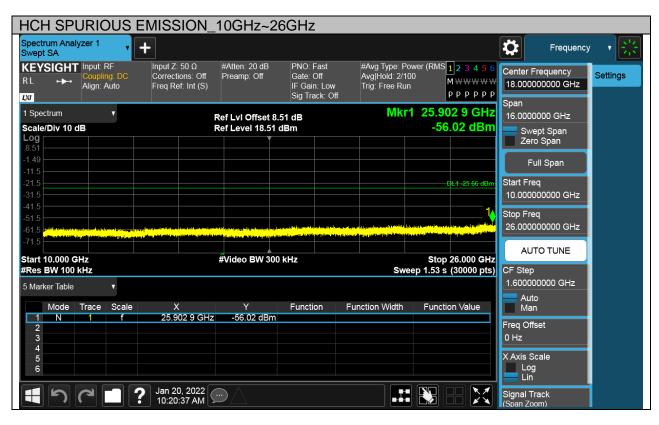
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11B | HCH | PASS |





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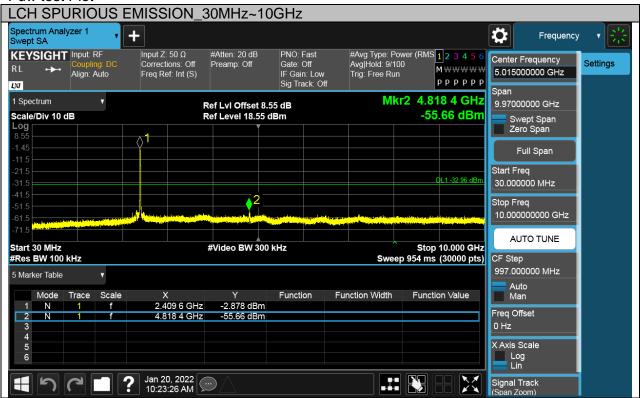
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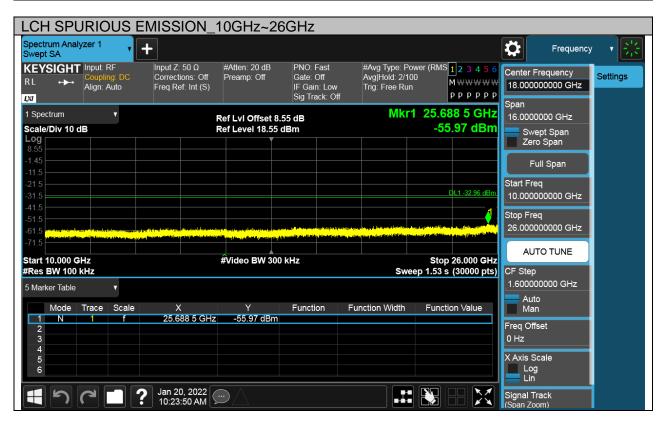
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G | LCH | PASS |





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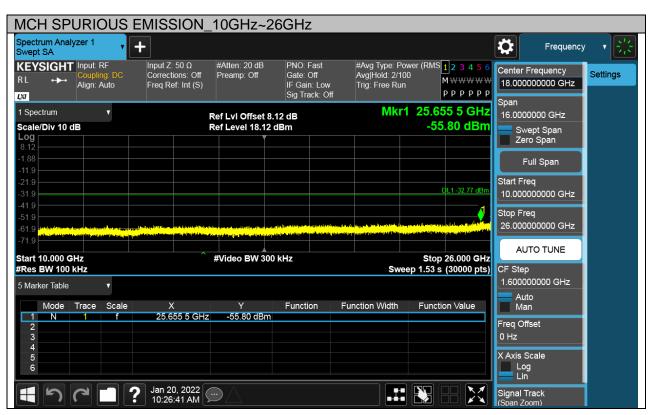
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G | MCH | PASS |





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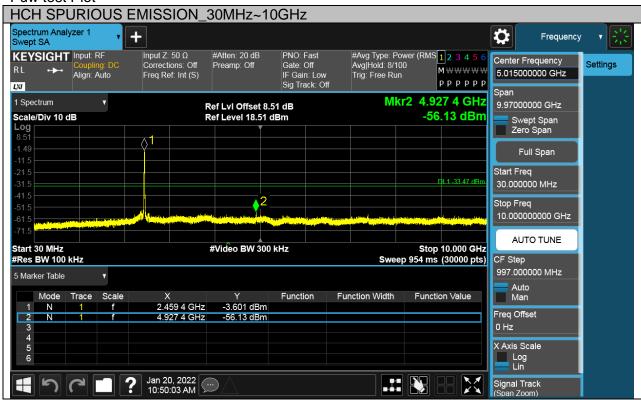
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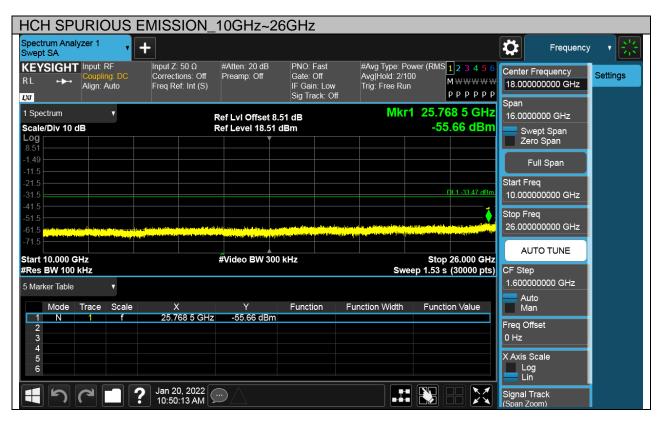
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11G | HCH | PASS |





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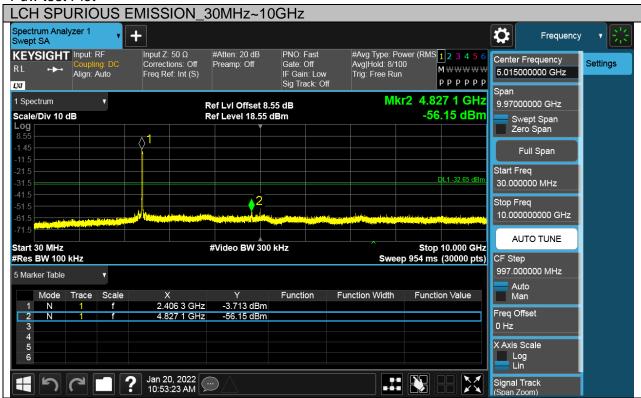
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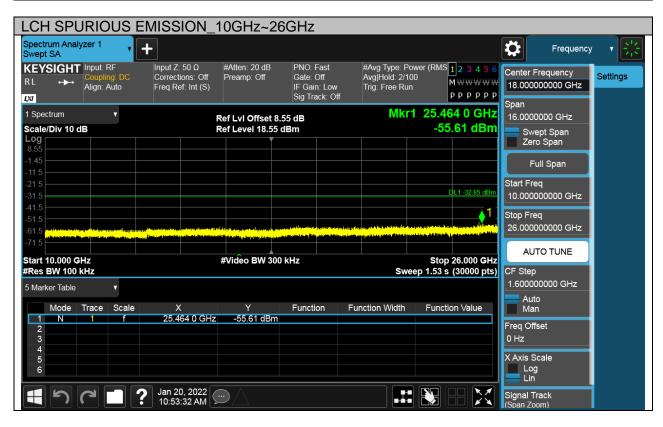
| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N HT20 | LCH | PASS |





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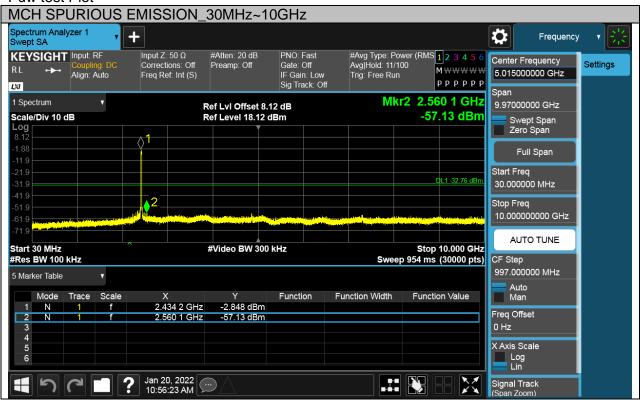


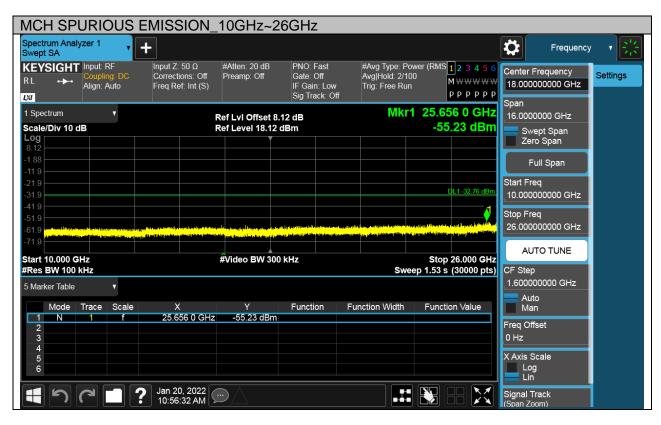
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| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N HT20 | MCH | PASS |











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| Test Mode | Channel | Verdict |
|-----------|---------|---------|
| 11N HT20 | HCH | PASS |

