

GUANGDONG HENGDI TECHNOLOGY
CORP.,LTD.

TEST REPORT

SCOPE OF WORK
FCC TESTING-1012254

REPORT NUMBER
GZHH00531672-002

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GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Application
For
Certification

FCC ID: 2AWZKHD24B24GR**Drone Mach 10inch with Camera Streaming****Model: 1012254****Additional Model: 101XXXX(where xxxx can be 0000-9999 which represent different customers)****Brand Name: Sharper Image****2.4GHz Wi-Fi Transceiver****Report No.: GZHH00531672-002**

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

Prepared and Checked by:**Approved by:**

Sign on file

**Terry Tang
Assistant Supervisor**

**Ryan Chen
Project Engineer
Date: Apr 25, 2024**

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Intertek Testing Service Shenzhen Ltd. Longhua Branch

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MEASUREMENT/TECHNICAL REPORT**Drone Mach 10inch with Camera Streaming****Model: 1012254****FCC ID: 2AWZKHD24B24GR**

This report concerns (check one) Original Grant Class II Change

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-23] Edition] provision.

Report prepared by:

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1.0 Summary of Test Results

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Applicant Address: Building C, Jinhui Industrial Building, South of Yuting Road, East of Taian Road Shantou China

Manufacturer: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Manufacturer Address: Building C, Jinhui Industrial Building, South of Yuting Road, East of Taian Road Shantou China

Model: 1012254

FCC ID: 2AWZKHD24B24GR

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Drone Mach 10inch with Camera Streaming with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. The EUT is powered by DC 3.7V rechargeable battery. Once use the USB cable charging to the EUT, the wireless function will be closed. For more detailed features description, please refer to the user's manual.

The Model: 101XXXX(where xxxx can be 0000-9999 which represent different customers) is the same as the Model: 1012254 in hardware aspect. The difference in model number serves as marketing strategy.

Type of Modulation: CCK, BPSK, QPSK, 16QAM, 64QAM.

Antenna Type: Integral Antenna

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

Remaining portions are subject to the following procedures:

1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 15B SDOC.
3. The Corresponding transmitter is in the process of being filed under the FCC ID: 2AWZKHD24B24G.

2.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.10: 2013 and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community GuanHu Subdistrict, LongHua District, Shenzhen, People's Republic of China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by DC 3.7V rechargeable battery during the test. Only the worst case mode is shown in the report.

The EUT has 802.11b/g/n-HT20 mode and one WIFI antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The unit was operated standalone and placed at the center of table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

Test software: FCC Assist 1.1.8

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

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3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by GUANGDONG HENGDI TECHNOLOGY CORP.,LTD. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
iPod (Provided by Intertek)	Apple	A1421

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Date of Test: Apr 19, 2024

Model: 1012254

4.0 Measurement Results**4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):**

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	0.0	1.0
Middle Channel: 2437	0.6	1.1
High Channel: 2462	0.8	1.2

IEEE 802.11g (Antenna Gain = 2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	1.5	1.4
Middle Channel: 2437	1.9	1.5
High Channel: 2462	2.3	1.7

IEEE 802.11n-HT20 (Antenna Gain = 2dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	1.7	1.5
Middle Channel: 2437	2.3	1.7
High Channel: 2462	2.9	1.9

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 2.9dBm

EUT max. E.I.R.P = 2.9dBm + 2dBi = 4.9dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

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Date of Test: Apr 19, 2024

Model: 1012254

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	10.170
2437	10.200
2462	10.200

IEEE 802.11g(16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.110
2437	16.350
2462	16.350

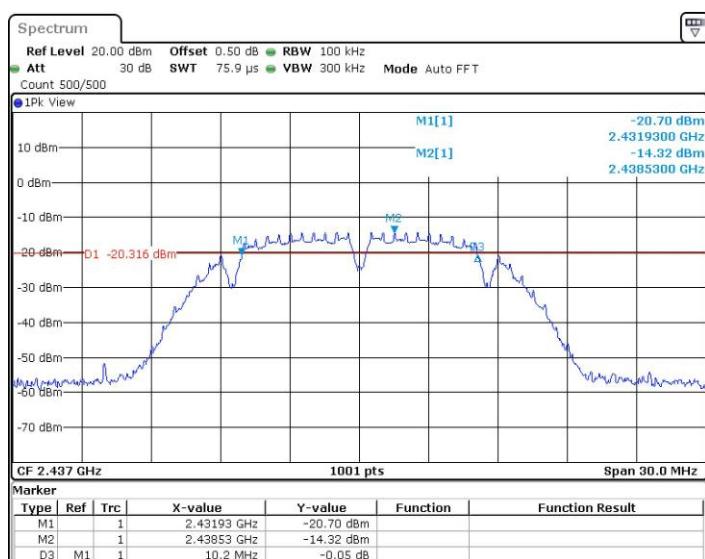
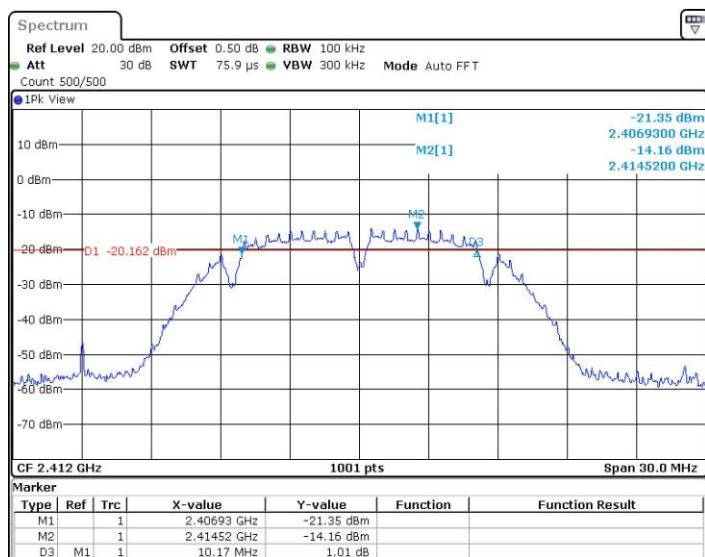
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.110
2437	16.350
2462	16.590

The test plots are attached as below.

TEST REPORT

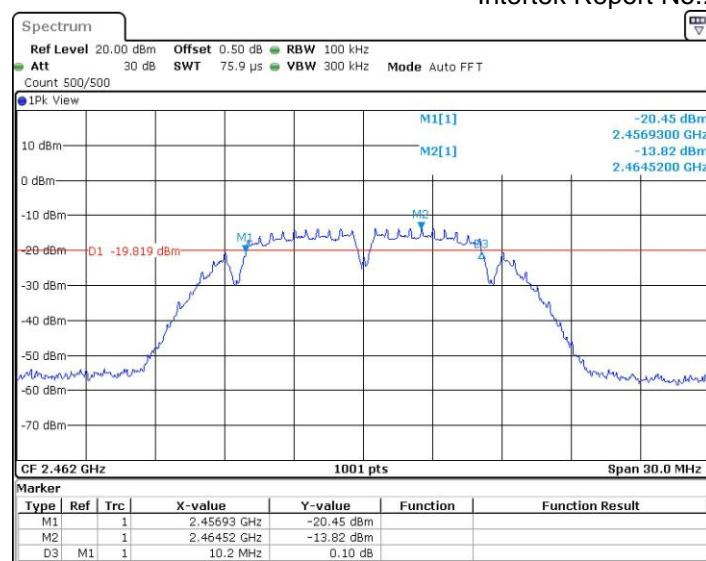
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802.11b



TEST REPORT

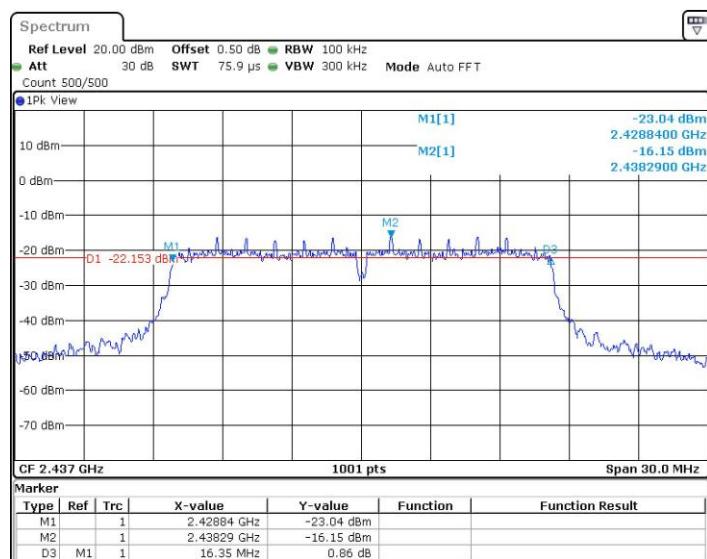
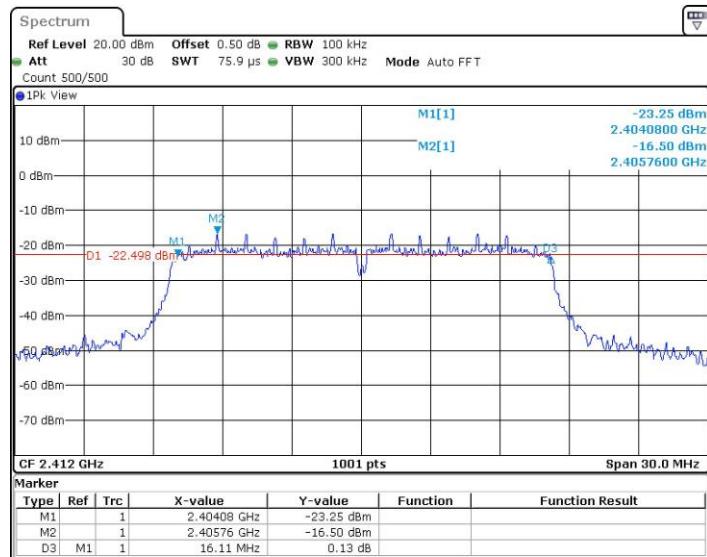
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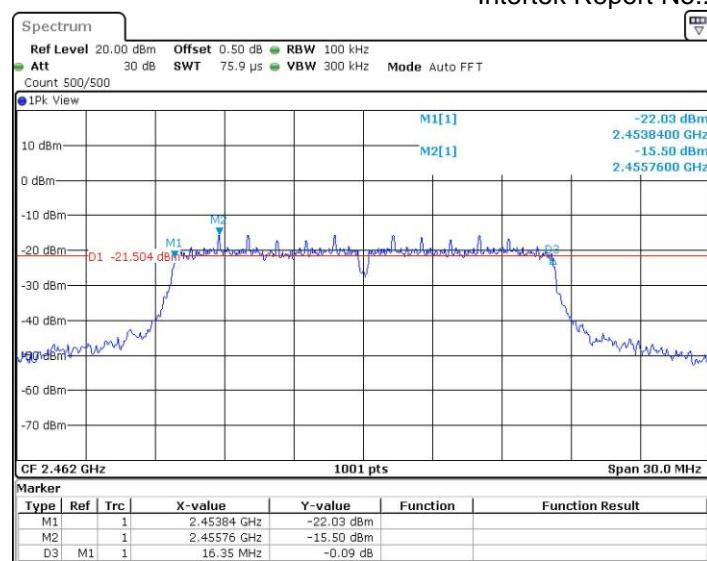
802.11g

Intertek Report No.: GZHH00531672-002



TEST REPORT

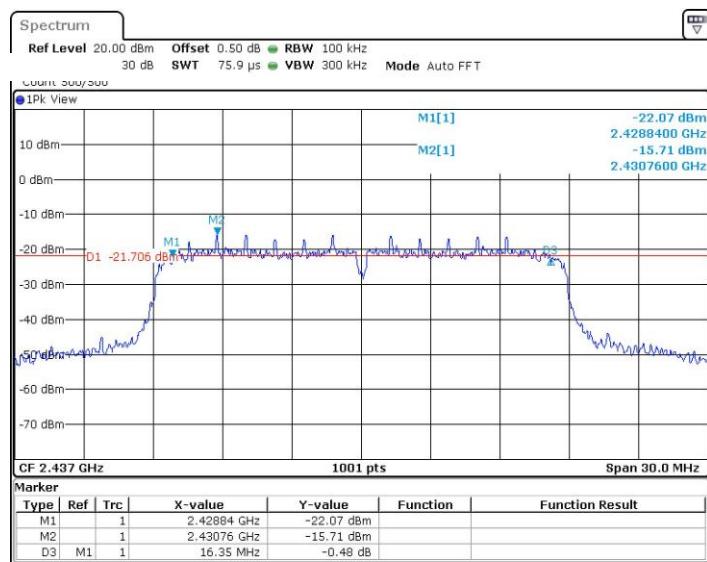
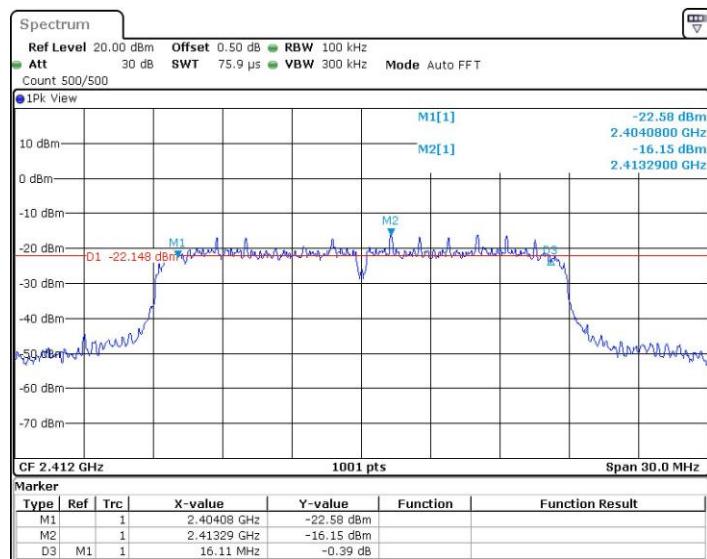
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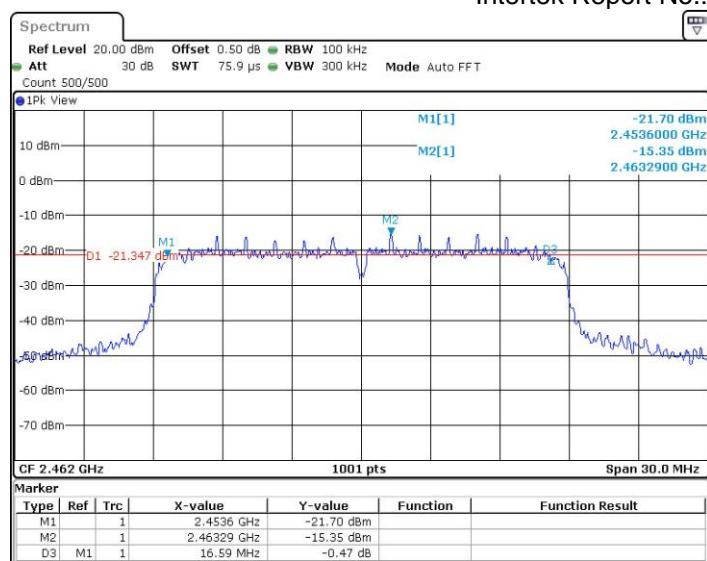
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802.11n-HT20



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Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-30.52
2437	-30.10
2462	-29.89

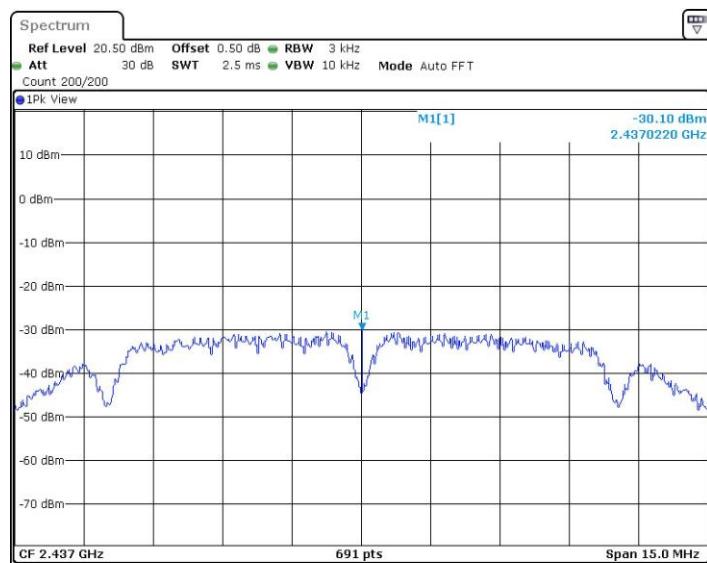
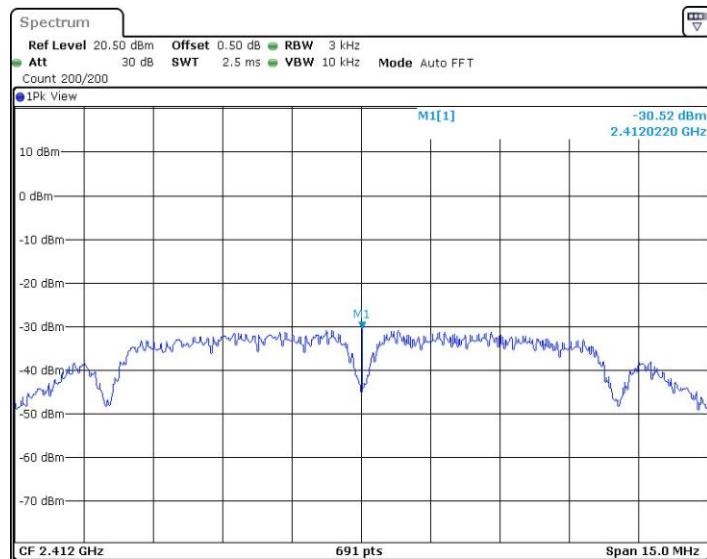
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-31.85
2437	-31.16
2462	-30.20

IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-29.93
2437	-29.77
2462	-30.80

The test plots are attached as below.

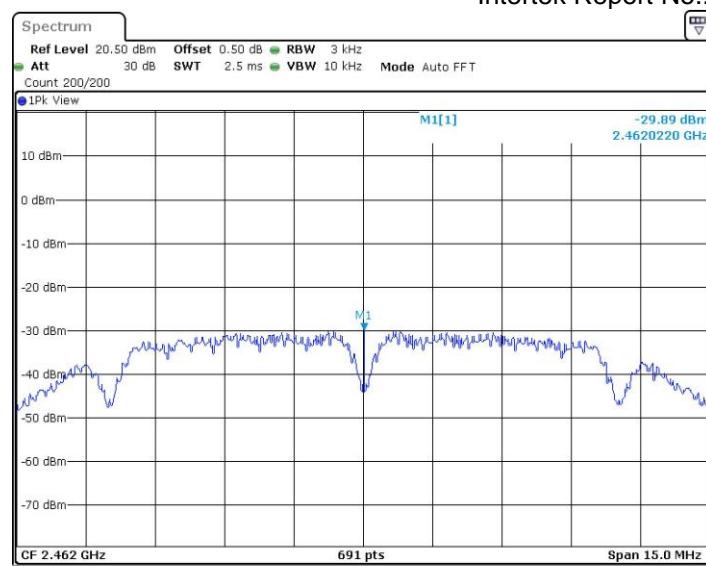
TEST REPORT**802.11b**

Intertek Report No.: GZHH00531672-002



TEST REPORT

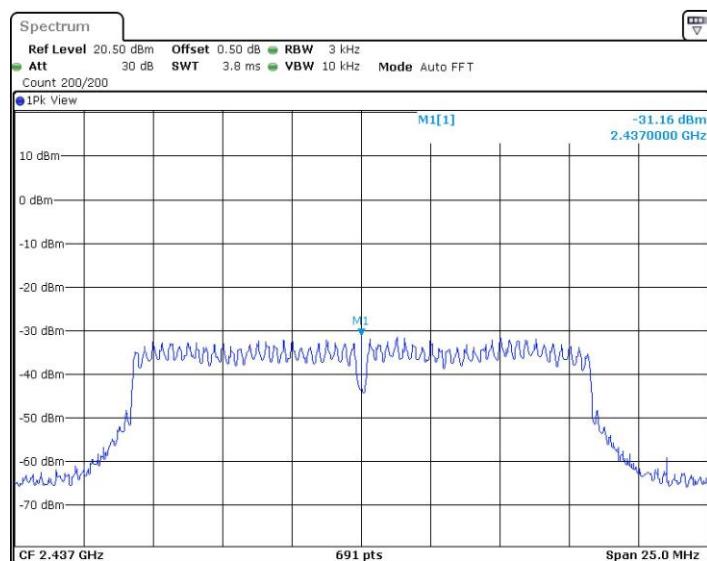
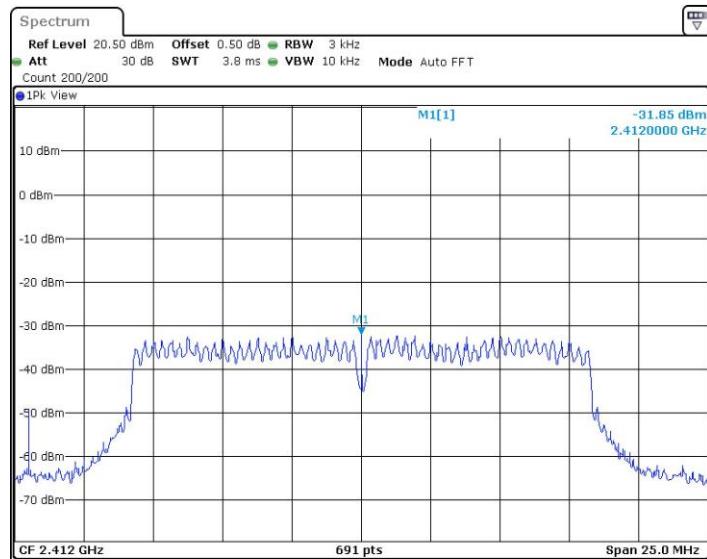
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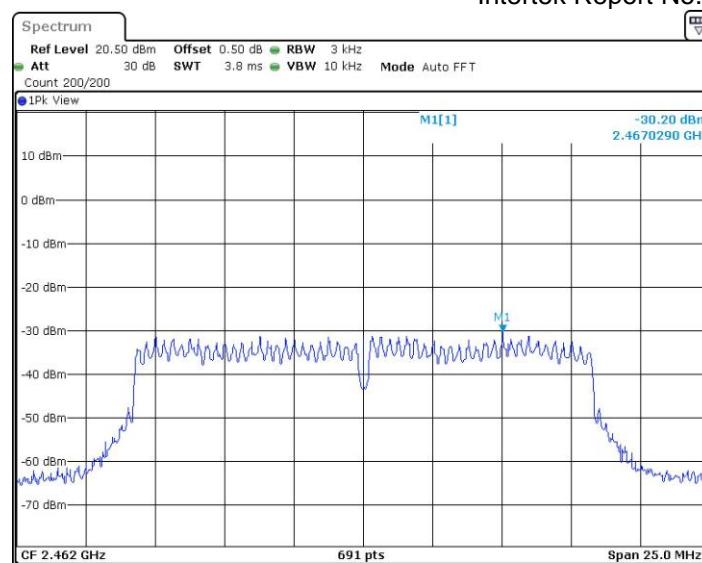
802.11g

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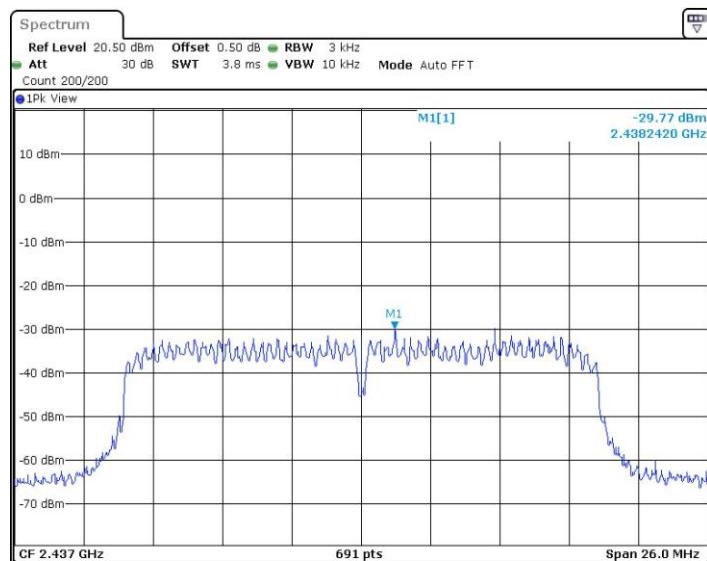
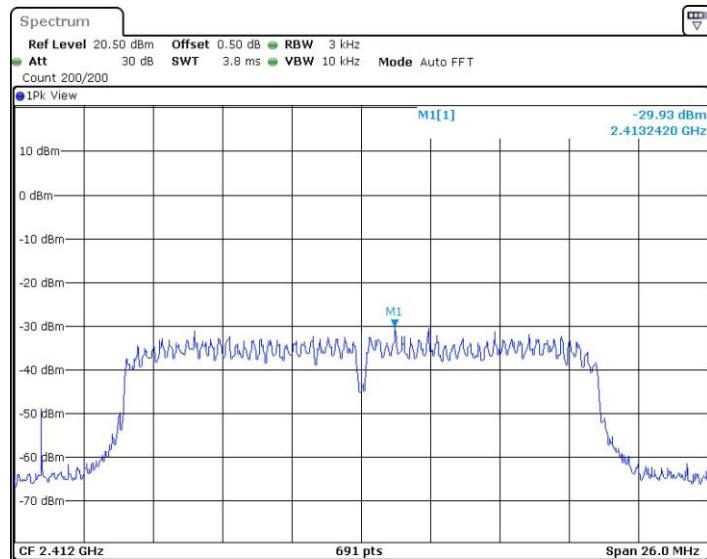
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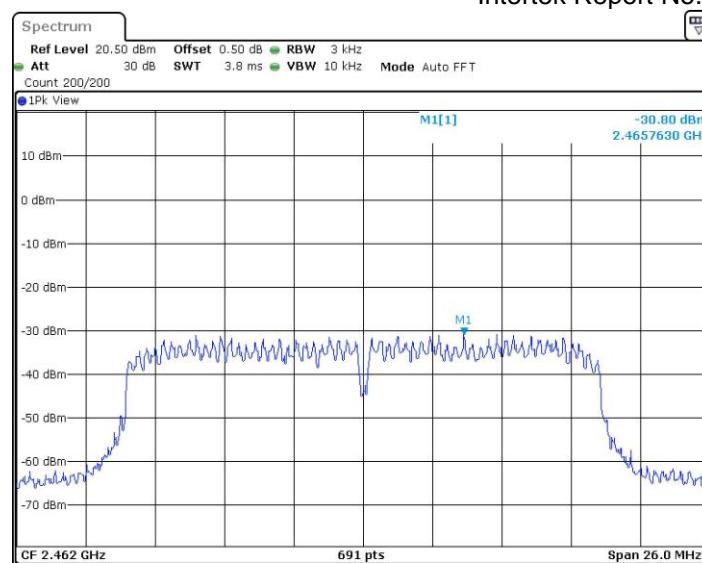
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802.11n-HT20



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4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g/n-HT20.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

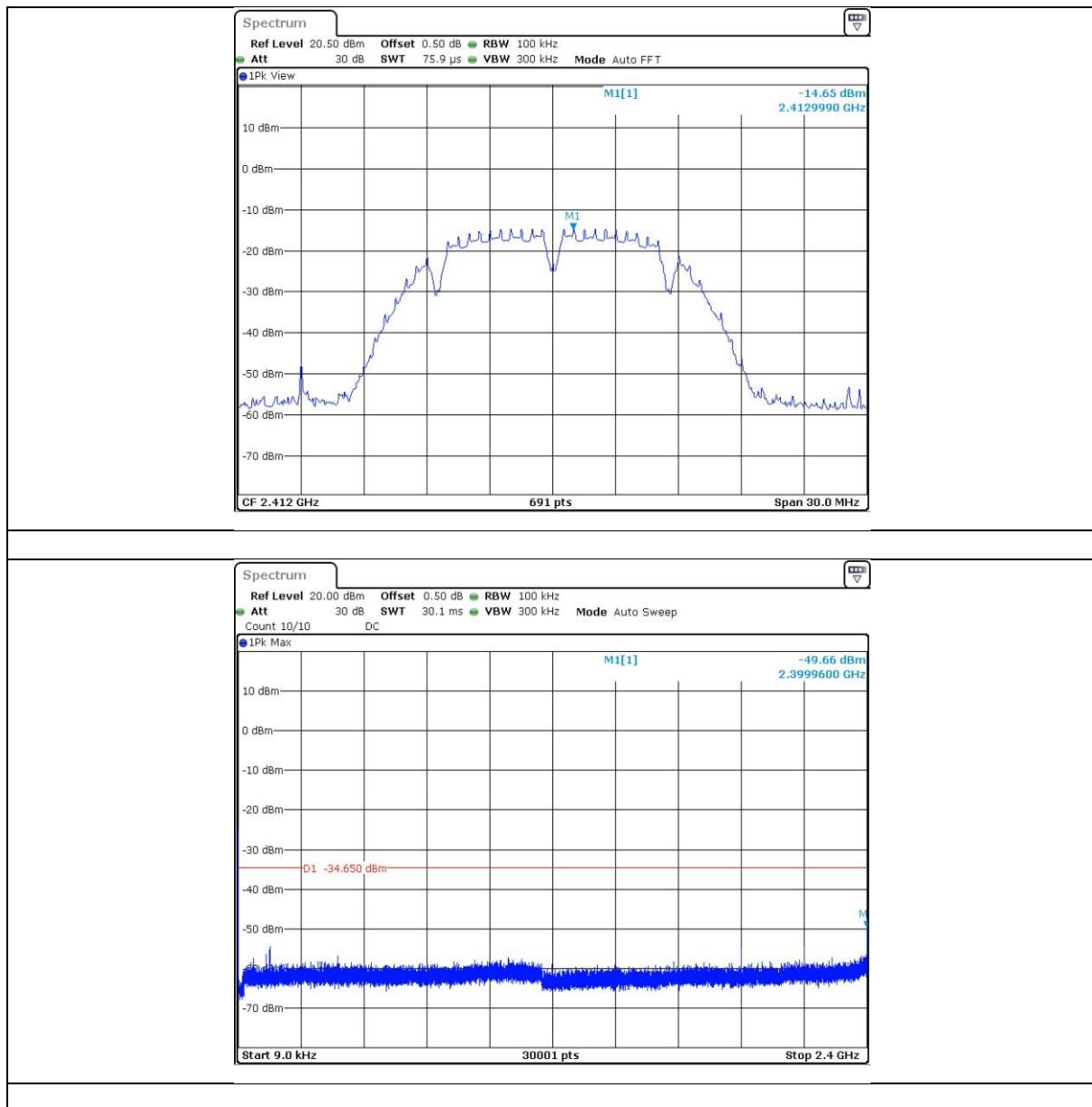
The test plots are attached as below.

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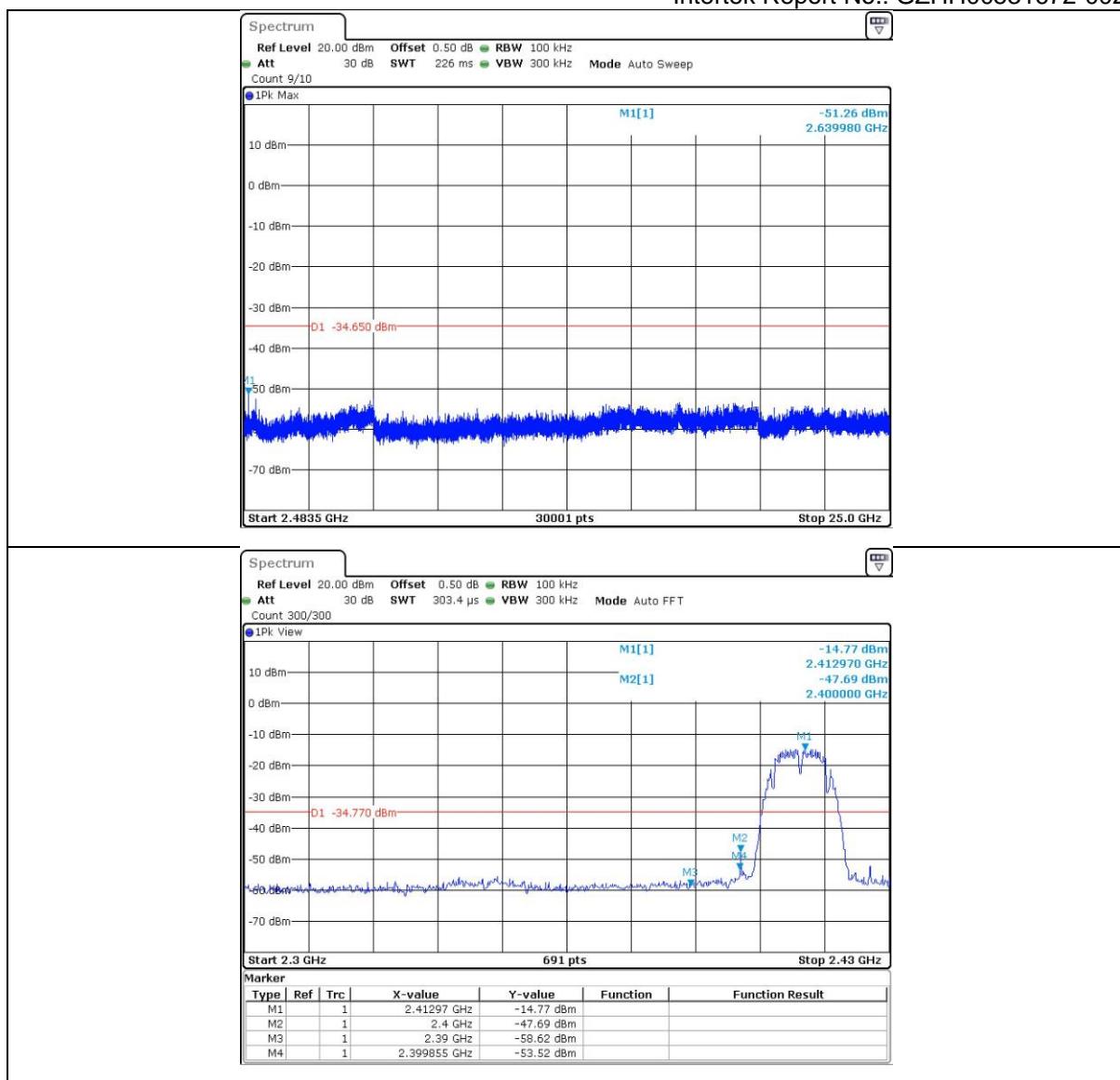
802.11b

Channel 01 (2412MHz) Reference Level: -14.65dBm



TEST REPORT

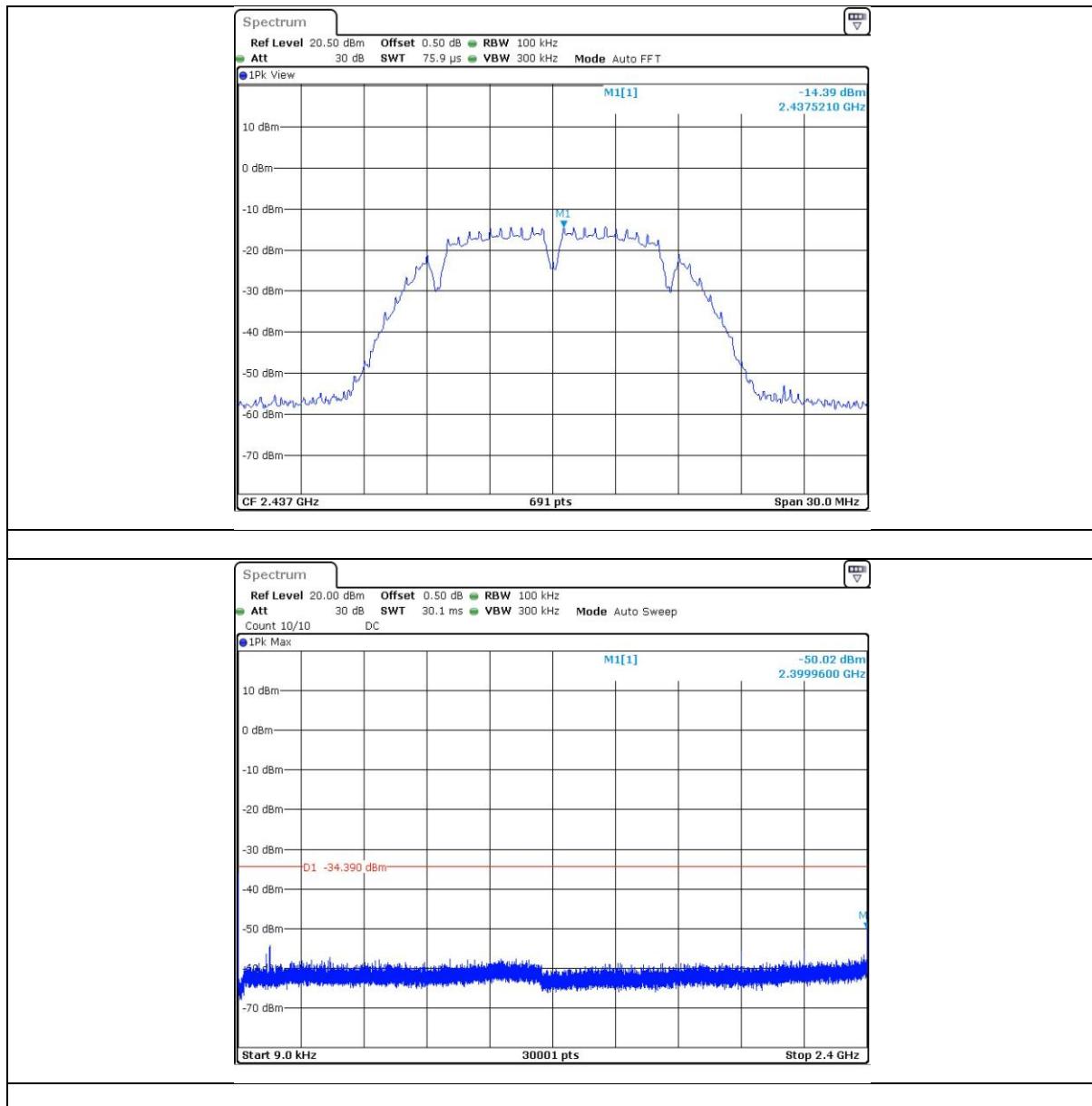
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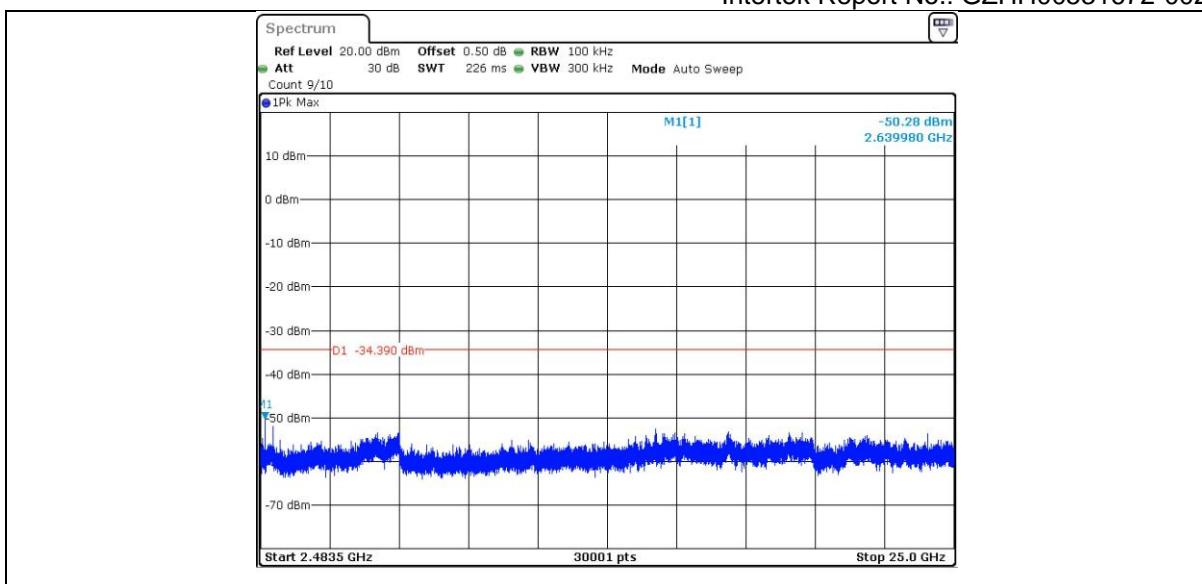
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Channel 06 (2437MHz) Reference Level: -14.39dBm



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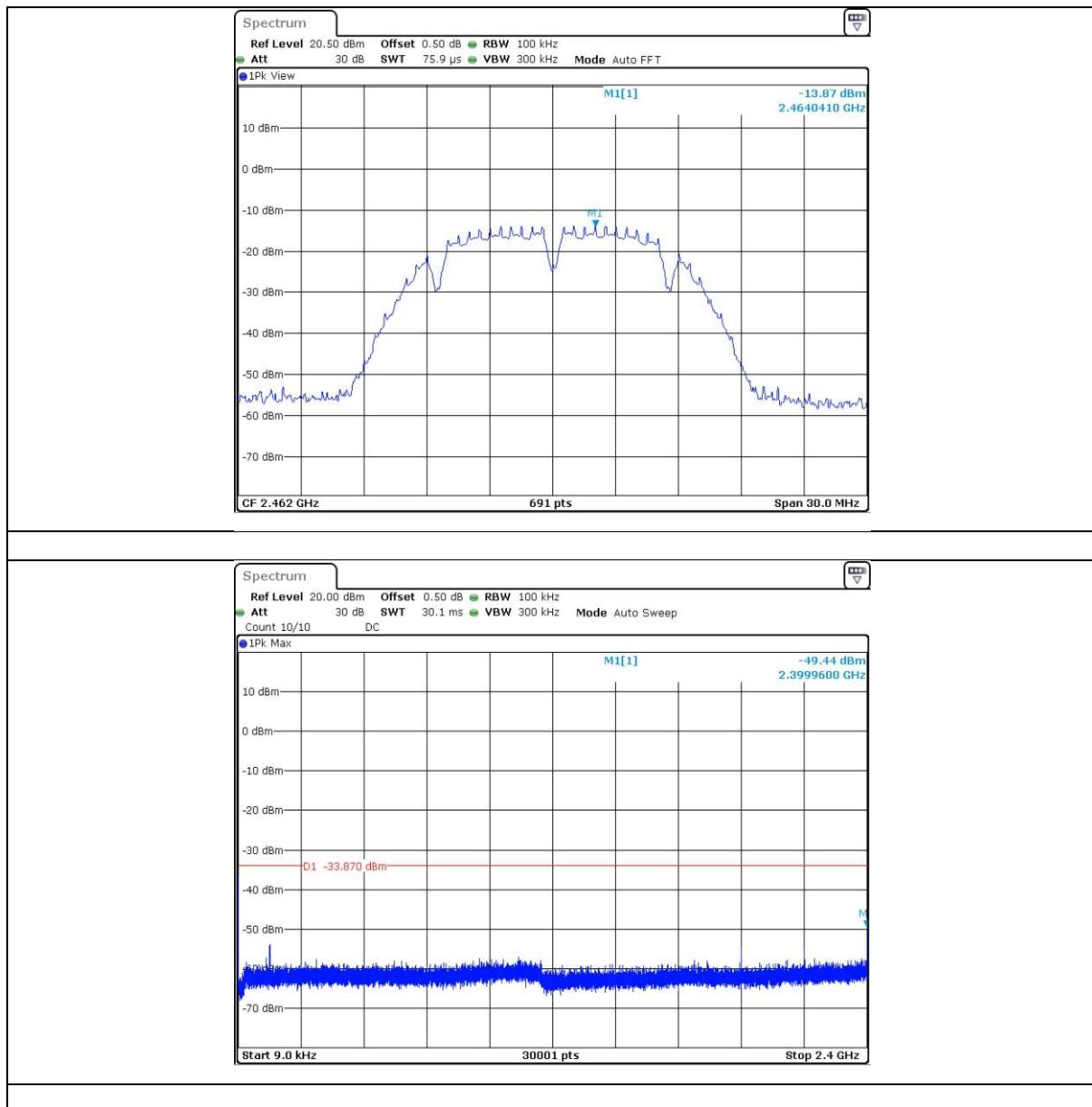
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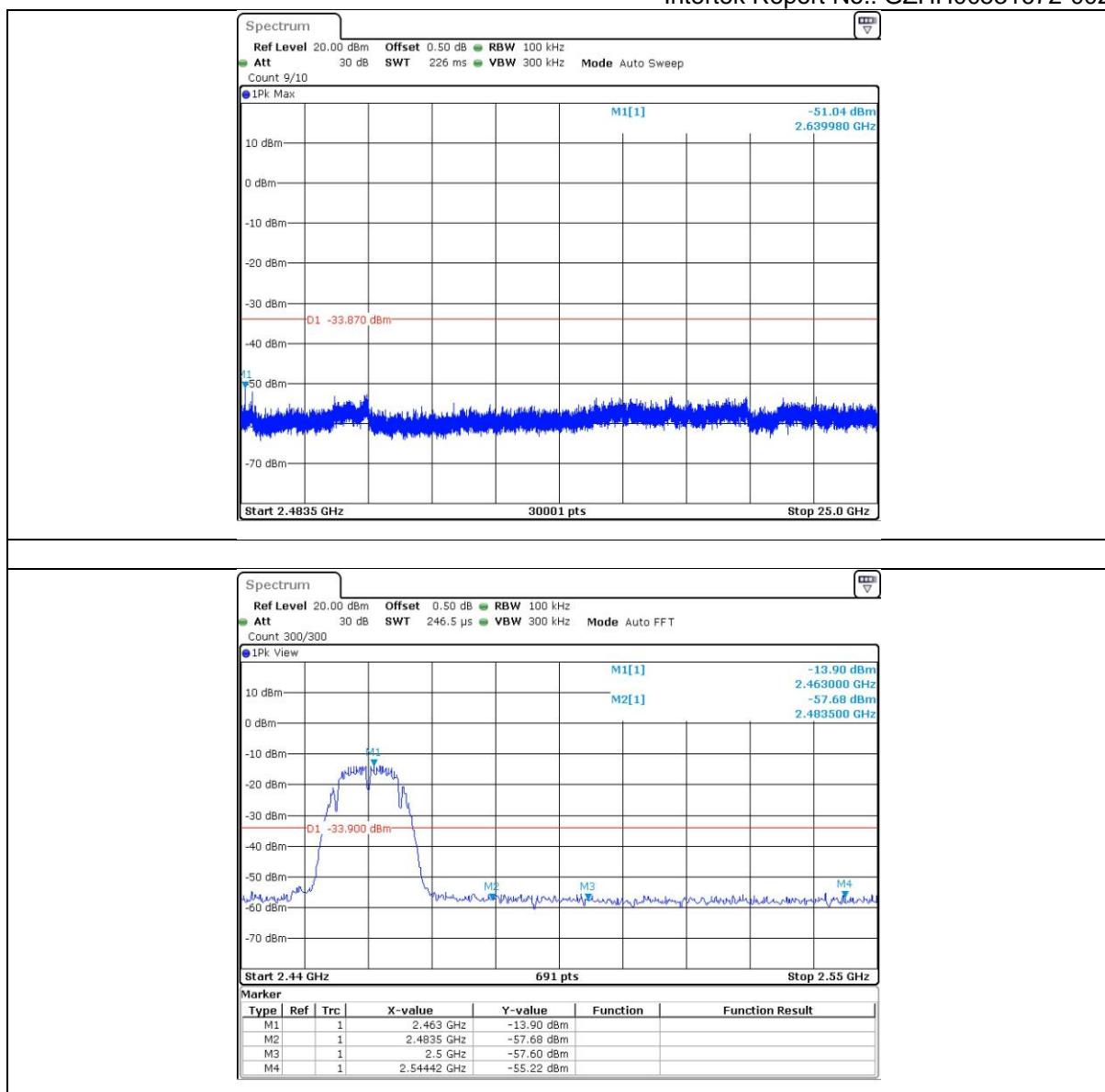
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Channel 11 (2462MHz) Reference Level: -13.87dBm



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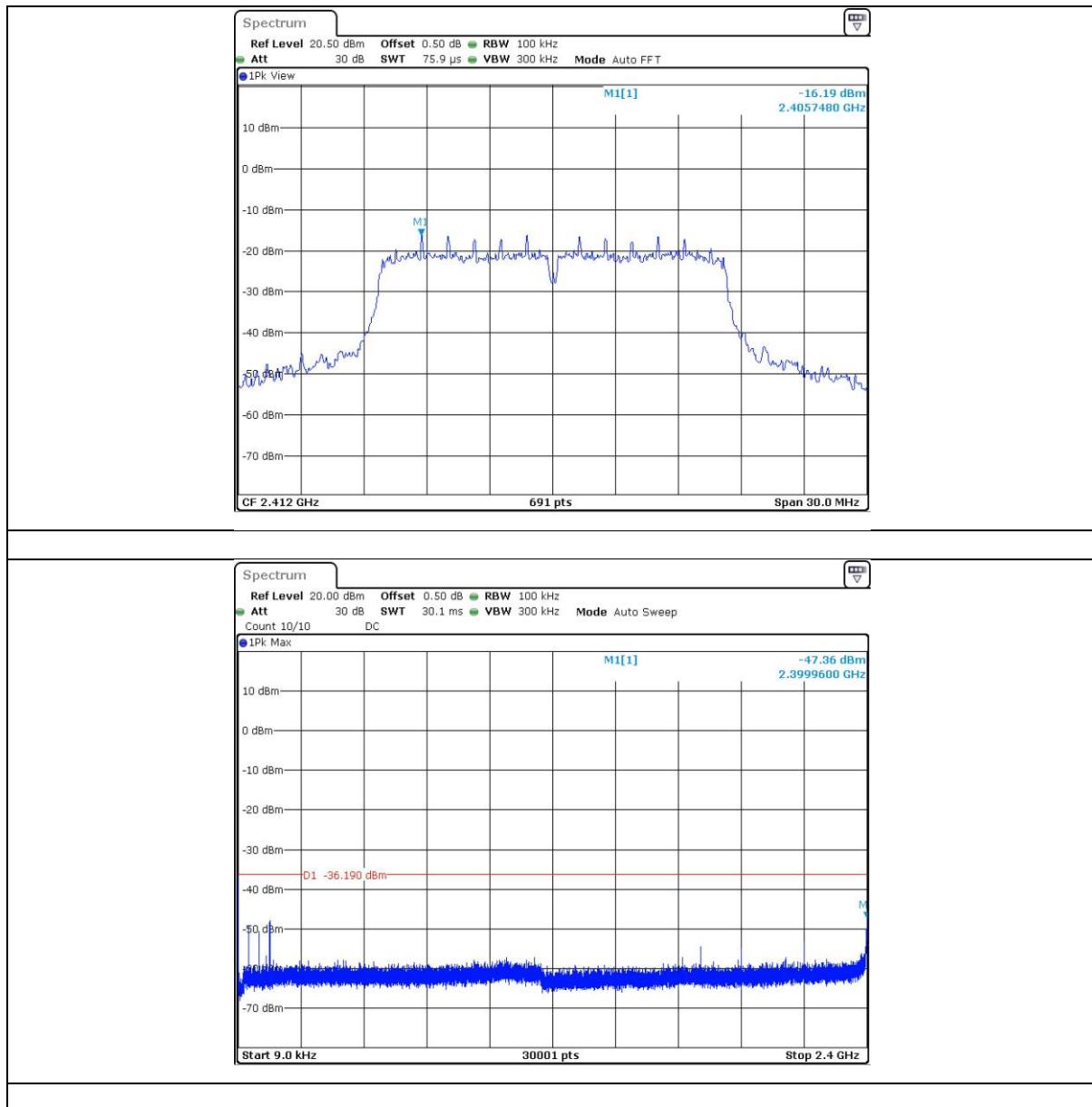


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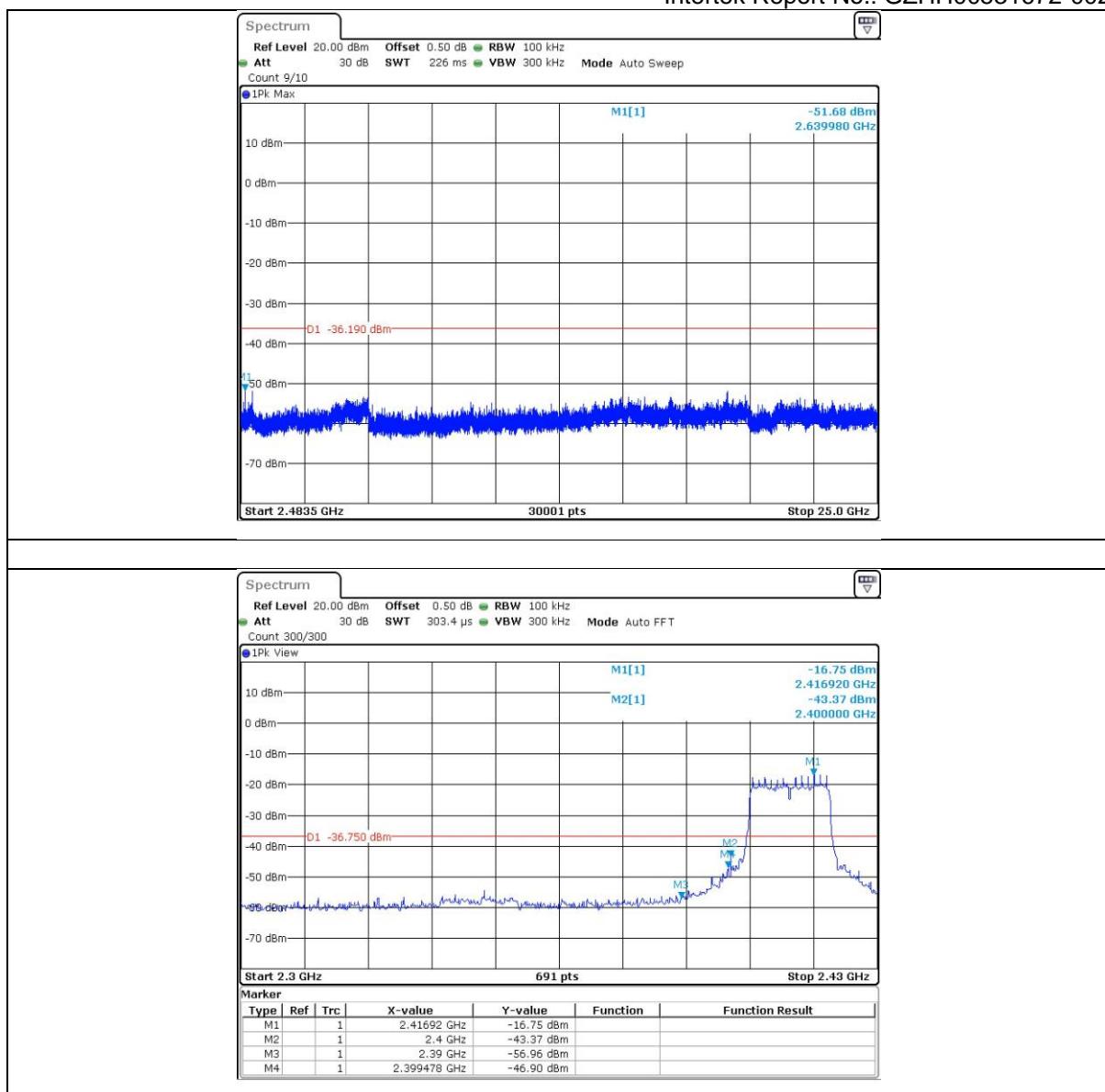
802.11g

Channel 01 (2412MHz) Reference Level: -16.19dBm



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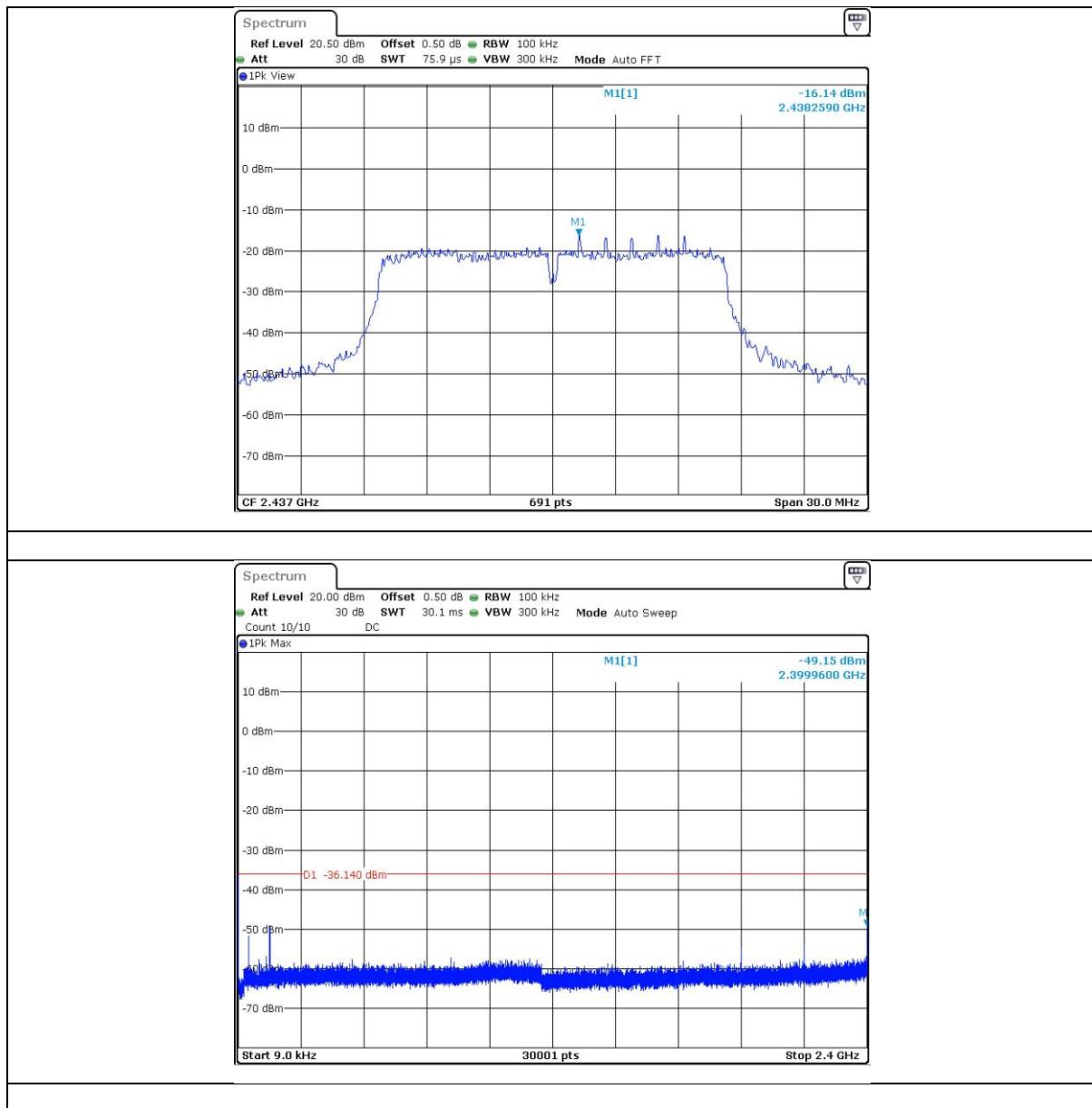
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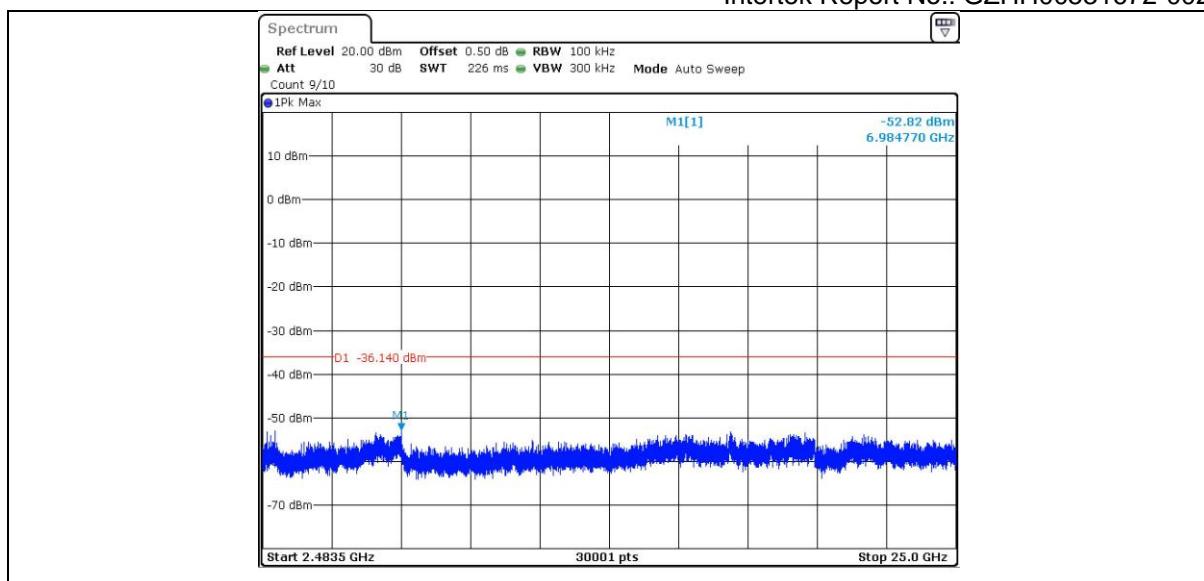
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Channel 06 (2437MHz) Reference Level: -16.14dBm



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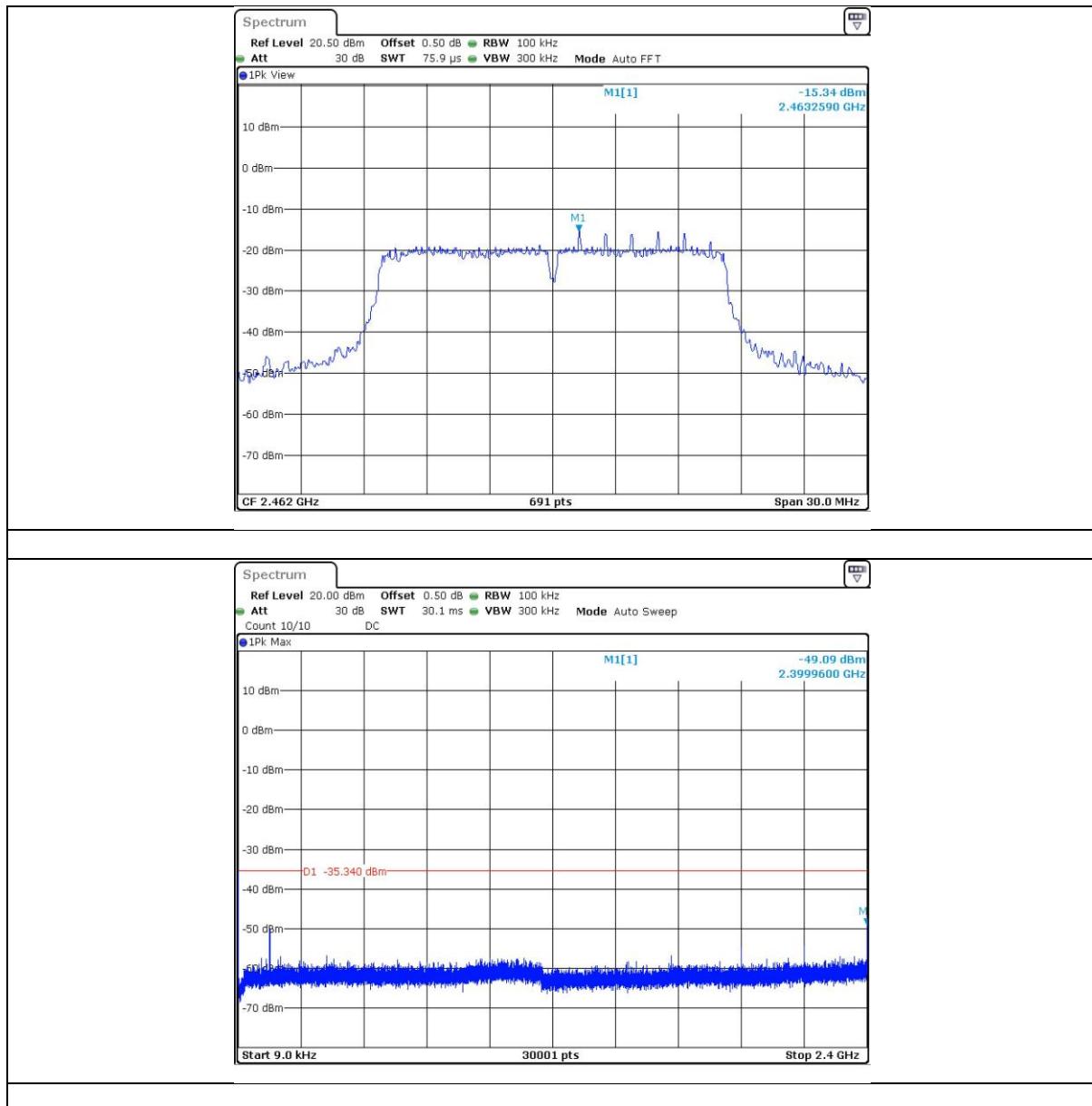
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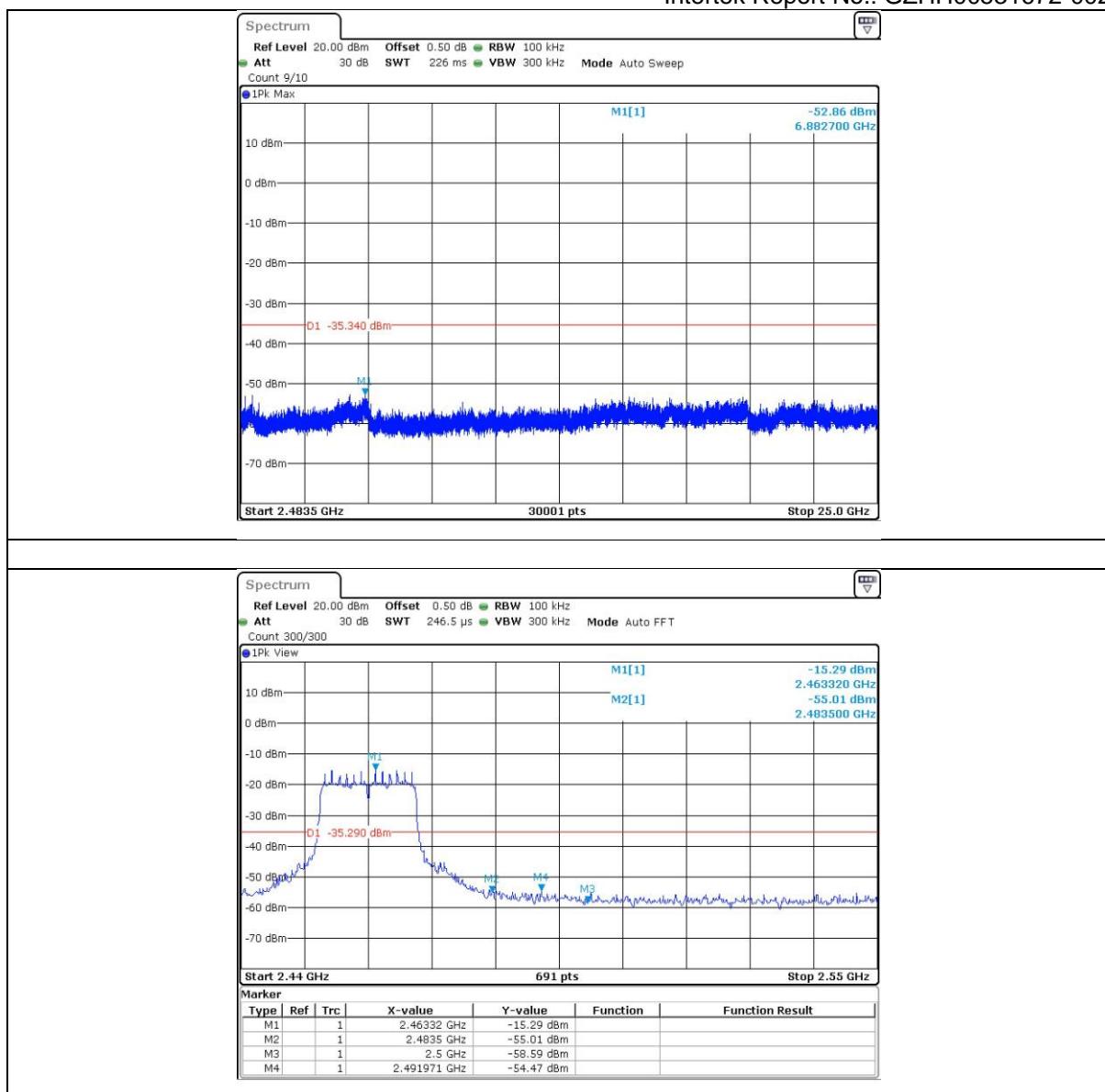
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Channel 11 (2462MHz) Reference Level: -15.34dBm



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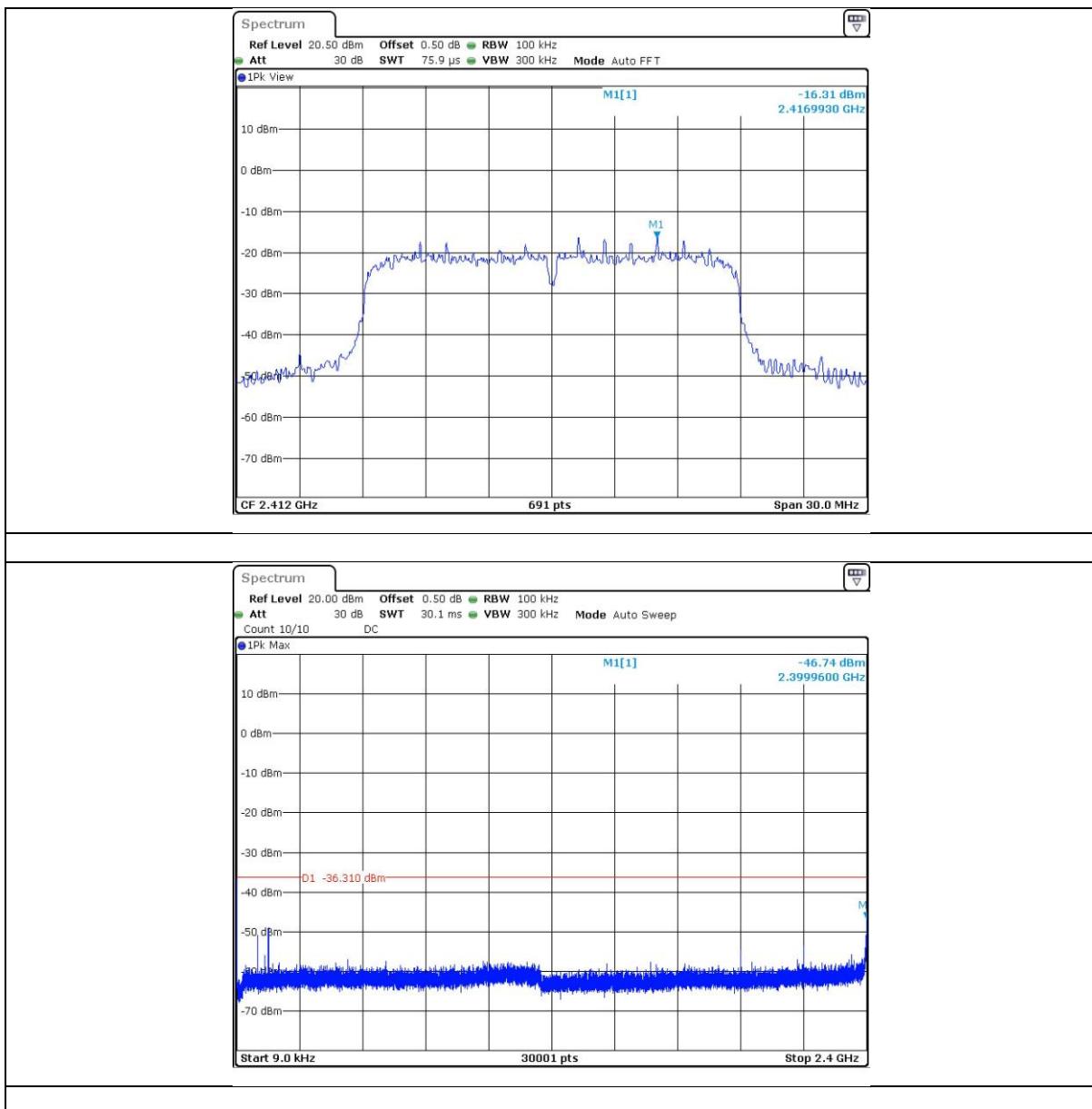


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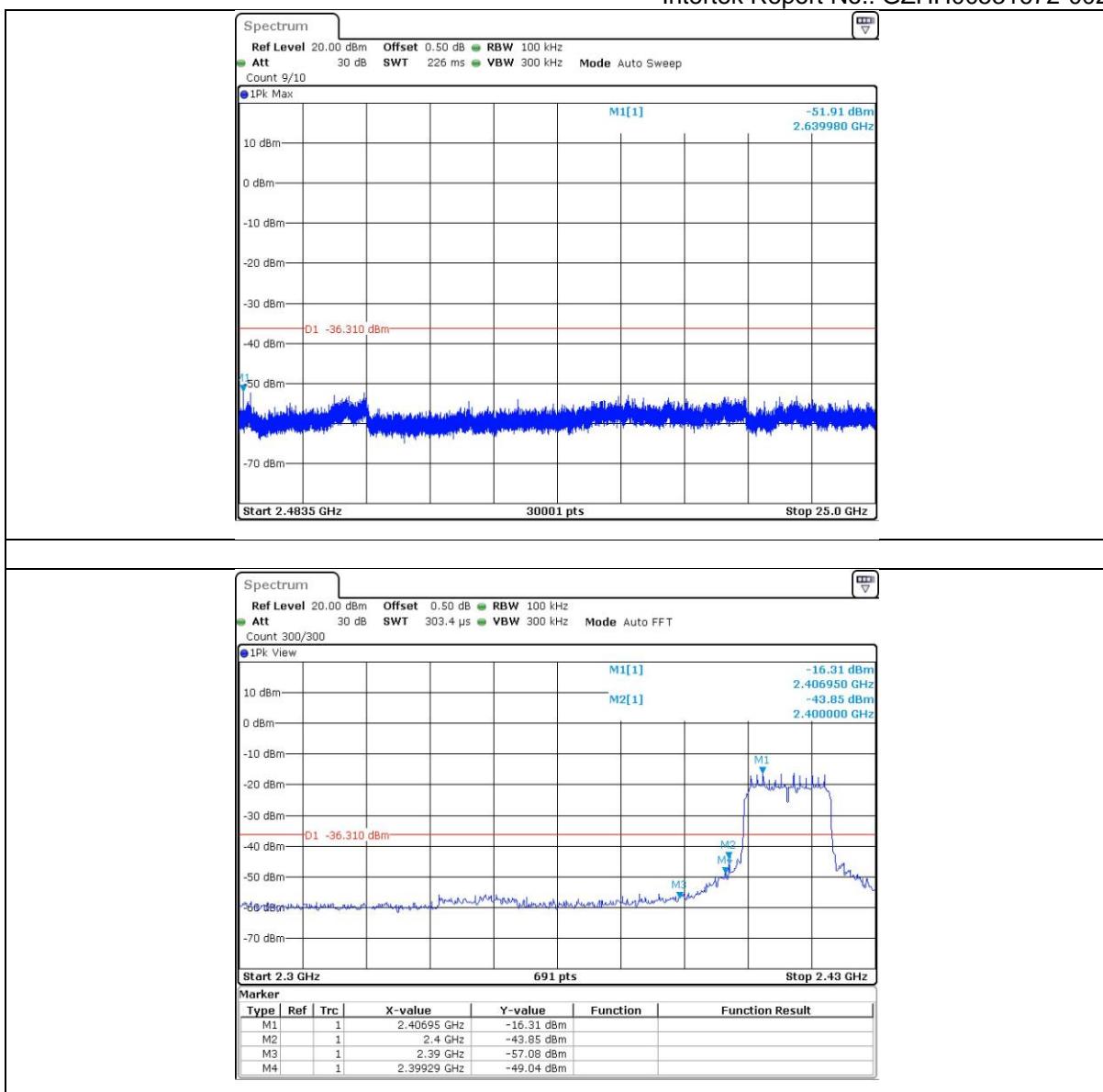
802.11n-HT20

Channel 01 (2412MHz) Reference Level: -16.31dBm



TEST REPORT

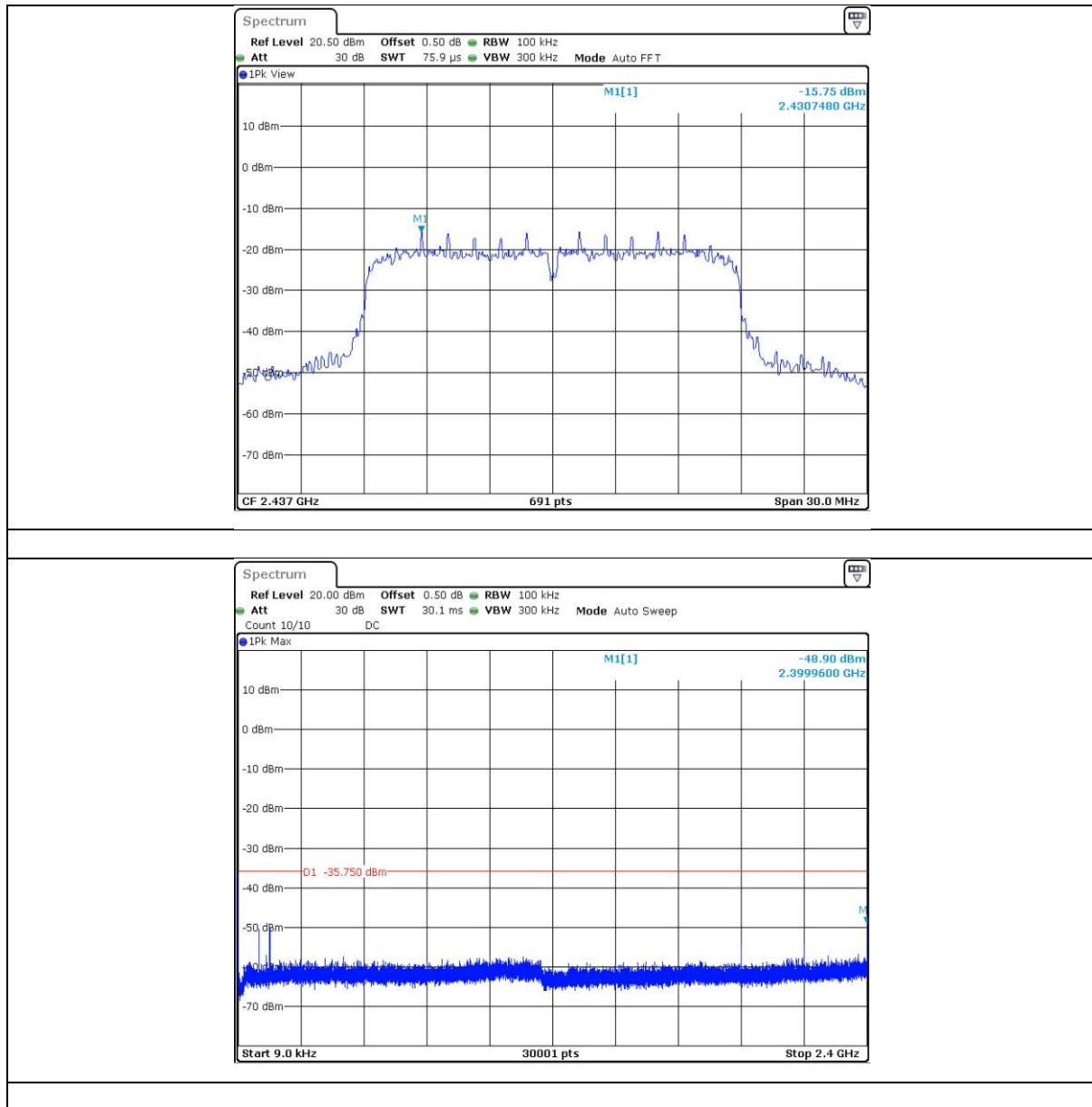
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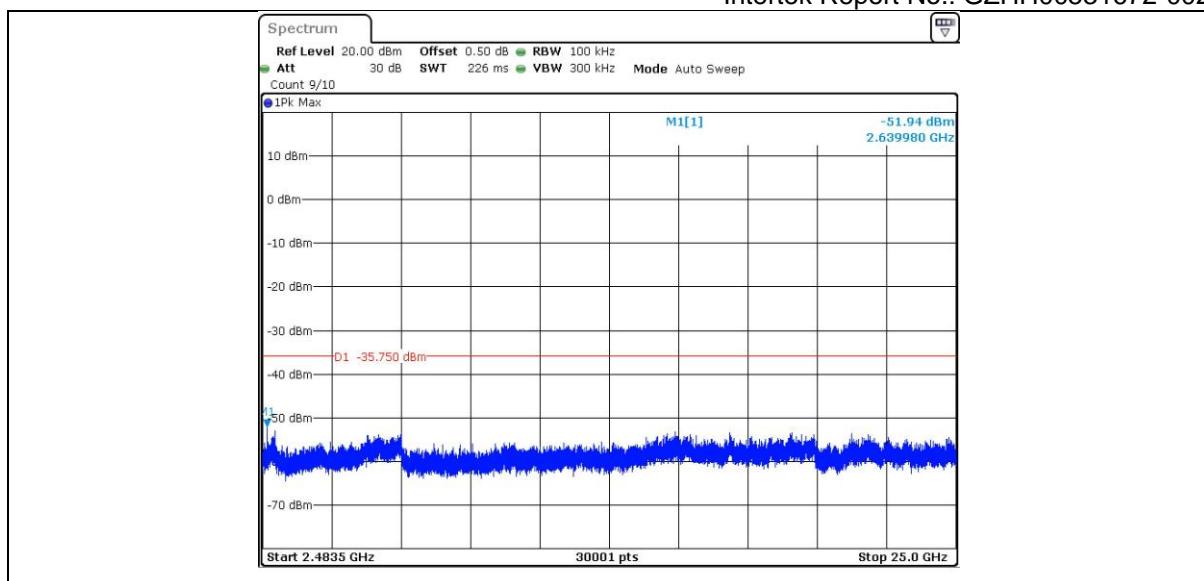
Intertek Report No.: GZHH00531672-002

Channel 06 (2437MHz) Reference Level: -15.75dBm



TEST REPORT

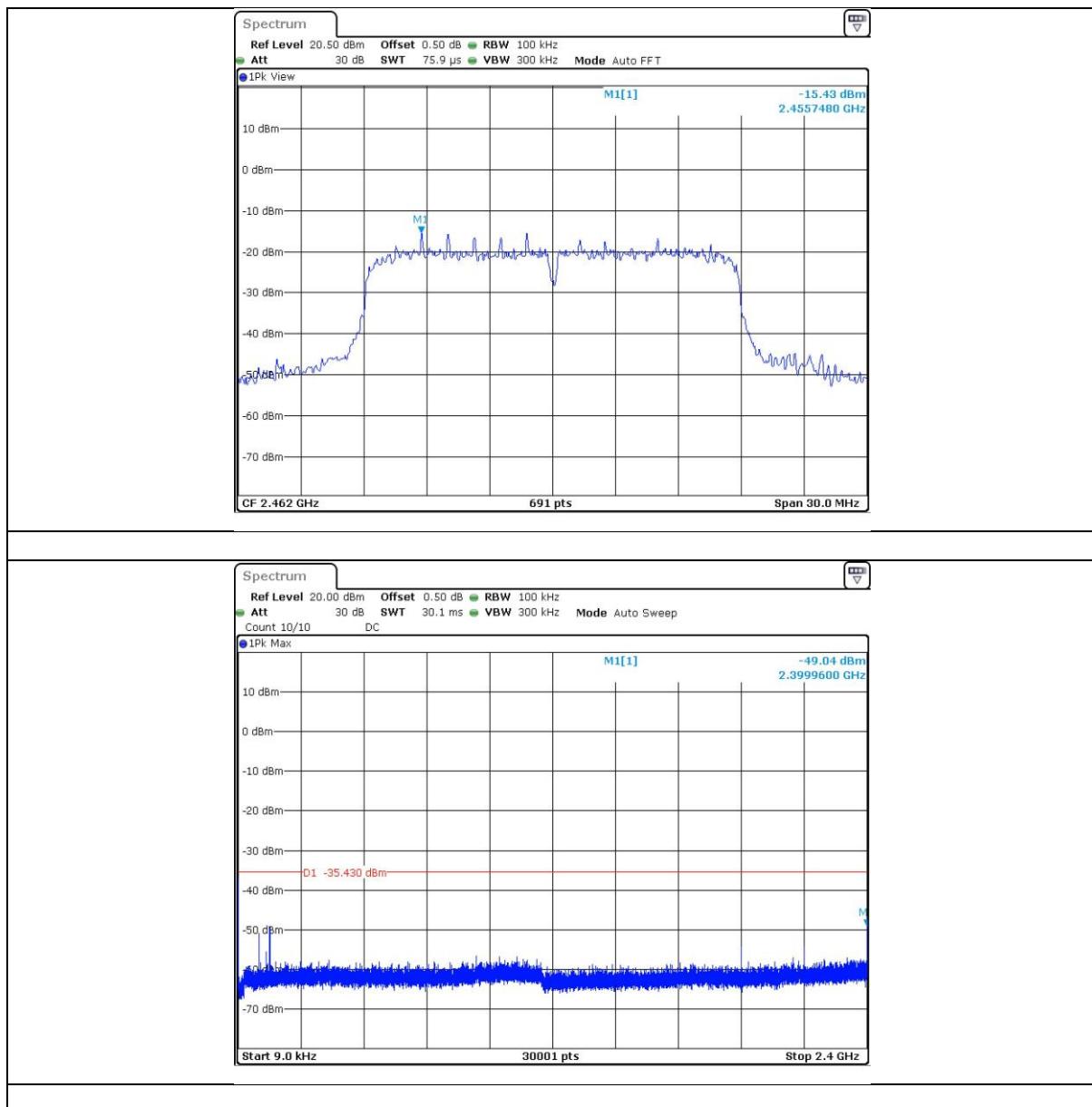
Intertek Report No.: GZHH00531672-002



TEST REPORT

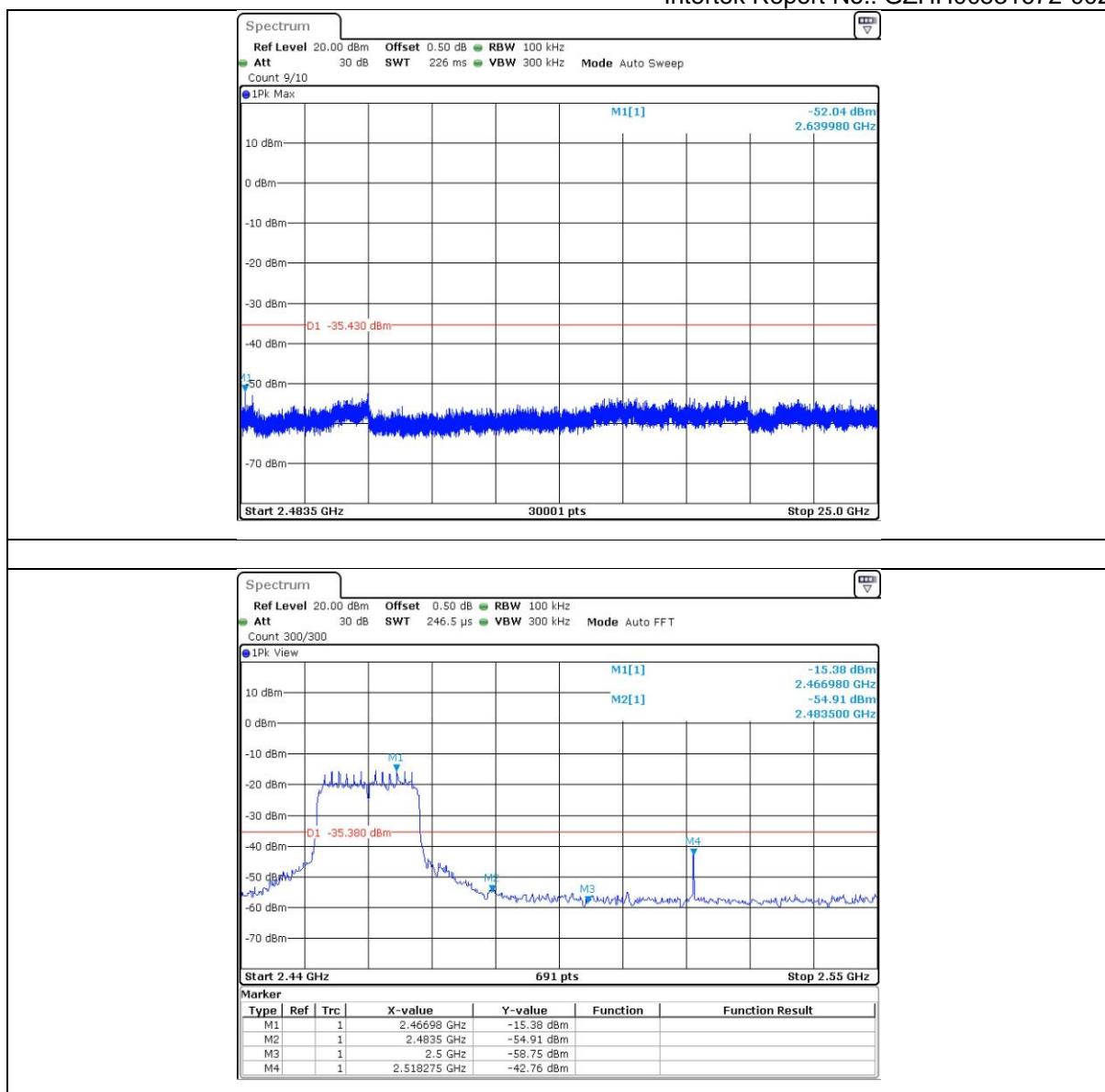
Intertek Report No.: GZHH00531672-002

Channel 11 (2462MHz) Reference Level: -15.43Bm



TEST REPORT

Intertek Report No.: GZHH00531672-002



TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Not required, since all emissions are more than 20dB below fundamental
 See attached data sheet

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where

FS = Field Strength in $\text{dB}\mu\text{V}/\text{m}$ RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

Example

Assume a receiver reading of 62.0 $\text{dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 $\text{dB}\mu\text{V}/\text{m}$. This value in $\text{dB}\mu\text{V}/\text{m}$ was converted to its corresponding level in $\mu\text{V}/\text{m}$.

RA = 62.0 $\text{dB}\mu\text{V}$

AF = 7.4 dB/m

CF = 1.6 dB

AG = 29.0 dB

PD = 0 dB

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V}/\text{m}$$

Level in mV/m = Common Antilogarithm $[(42 \text{ dB}\mu\text{V}/\text{m})/20] = 125.9 \mu\text{V}/\text{m}$

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 01)
at
215.980700MHz

Judgement: Passed by 1.9dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

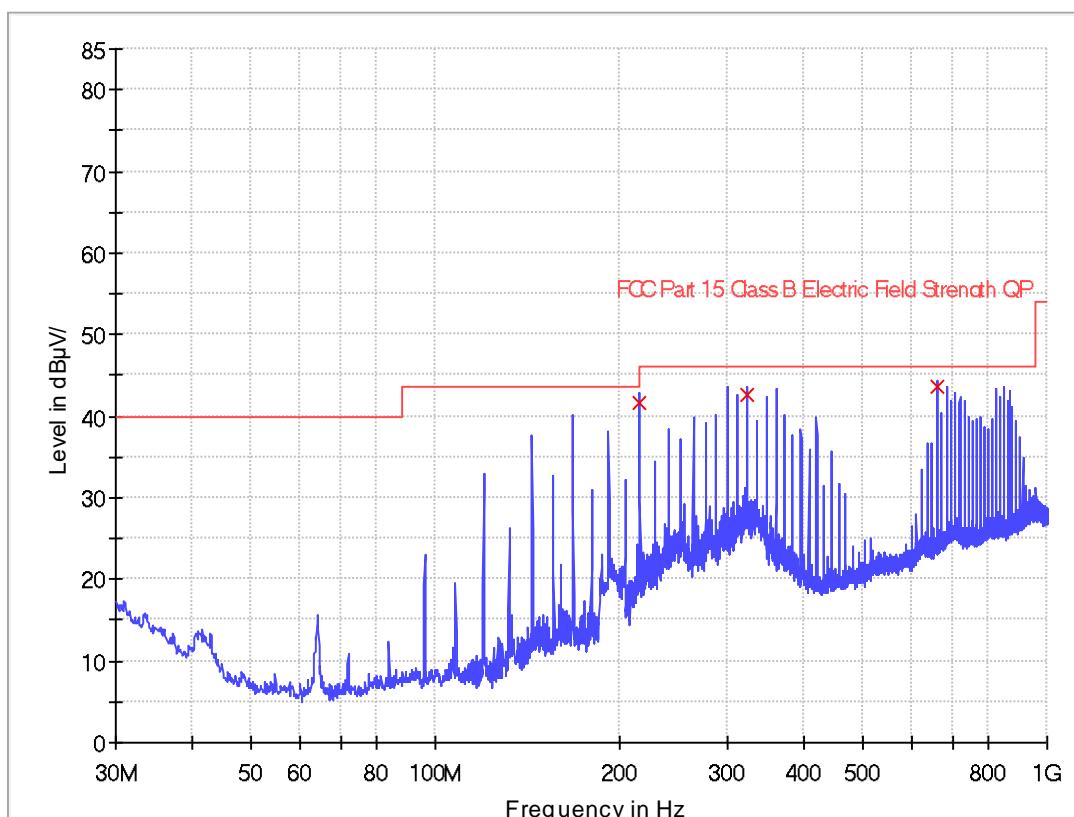
Date of Test: Apr 19, 2024

Model: 1012254

Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Horizontal

FCC Part 15



Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V/m)
215.980700	41.6	1000.0	120.000	H	12.3	1.9	43.5
323.910000	42.7	1000.0	120.000	H	16.1	3.3	46.0
660.015000	43.7	1000.0	120.000	H	24.1	2.3	46.0

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dB μ V/m) = Corr. (dB/m) + Read Level (dB μ V)
3. Margin (dB) = Limit Line(dB μ V/m) – Level (dB μ V/m)

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

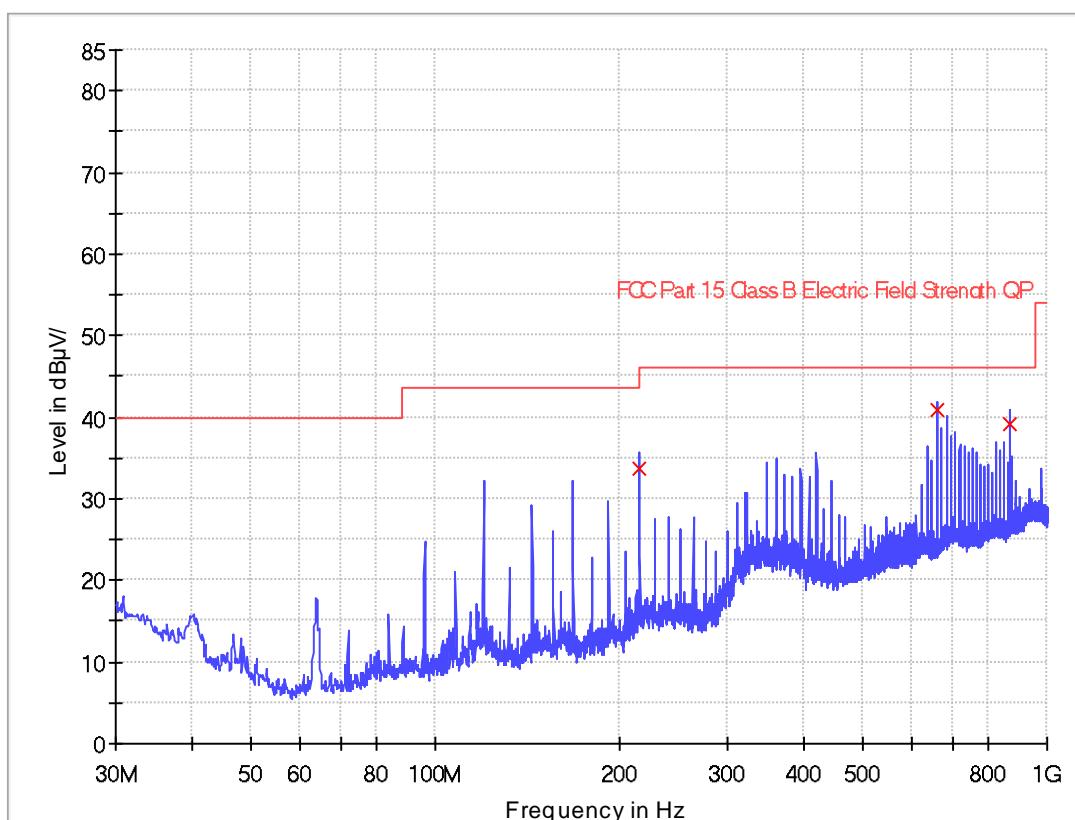
Date of Test: Apr 19, 2024

Model: 1012254

Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Vertical

FCC Part 15



Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V/m)
215.997500	33.8	1000.0	120.000	V	12.3	9.7	43.5
660.015000	40.9	1000.0	120.000	V	24.1	5.2	46.0
868.201250	39.2	1000.0	120.000	V	25.9	6.8	46.0

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dB μ V/m) = Corr. (dB/m) + Read Level (dB μ V)
3. Margin (dB) = Limit Line(dB μ V/m) – Level (dB μ V/m)

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	52.9	36.1	34.2	51.0	74.0	-23.0
Horizontal	*2331.120	49.7	34.7	33.1	48.1	74.0	-25.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	40.3	36.1	34.2	38.4	54.0	-15.6
Horizontal	*2331.120	41.7	34.7	33.1	40.1	54.0	-13.9

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11b-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	51.9	36.1	34.6	50.4	74.0	-23.6
Horizontal	*7311.000	47.2	35.6	37.1	48.7	74.0	-25.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	40.5	36.1	34.6	39.0	54.0	-15.0
Horizontal	*7311.000	38.6	35.6	37.1	40.1	54.0	-13.9

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	50.2	36.1	34.6	48.7	74.0	-25.3
Horizontal	*2485.220	47.5	35.6	37.2	49.1	74.0	-24.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	41.7	36.1	34.6	40.2	54.0	-13.8
Horizontal	*2485.220	40.5	35.6	37.2	42.1	54.0	-11.9

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11g-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	48.0	36.1	34.2	46.1	74.0	-27.9
Horizontal	*2321.100	51.6	34.7	33.1	50.0	74.0	-24.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	43.0	36.1	34.2	41.1	54.0	-12.9
Horizontal	*2321.100	41.6	34.7	33.1	40.0	54.0	-14.0

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	49.4	36.1	34.6	47.9	74.0	-26.1
Horizontal	*7311.000	47.5	35.6	37.1	49.0	74.0	-25.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.1	34.6	41.3	54.0	-12.7
Horizontal	*7311.000	40.0	35.6	37.1	41.5	54.0	-12.5

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11g-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	49.2	36.1	34.6	47.7	74.0	-26.3
Horizontal	*2488.320	48.5	35.6	37.2	50.1	74.0	-23.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	42.1	36.1	34.6	40.6	54.0	-13.4
Horizontal	*2488.320	38.5	35.6	37.2	40.1	54.0	-13.9

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11n-HT20-Channel 01)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	47.0	36.1	34.2	45.1	74.0	-28.9
Horizontal	*2323.200	52.9	34.7	33.1	51.3	74.0	-22.7

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4824.000	41.9	36.1	34.2	40.0	54.0	-14.0
Horizontal	*2322.200	40.5	34.7	33.1	38.9	54.0	-15.1

NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

Operating Mode: Transmitting (802.11n-HT20-Channel 06)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	48.2	36.1	34.6	46.7	74.0	-27.3
Horizontal	*7311.000	45.6	35.6	37.1	47.1	74.0	-26.9

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4874.000	41.9	36.1	34.6	40.4	54.0	-13.6
Horizontal	*7311.000	39.0	35.6	37.1	40.5	54.0	-13.5

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024 Model: 1012254

Operating Mode: Transmitting (802.11n-HT20-Channel 11)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	48.2	36.1	34.6	46.7	74.0	-27.3
Horizontal	*2488.120	50.0	35.6	37.2	51.6	74.0	-22.4

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	*4924.000	41.6	36.1	34.6	40.1	54.0	-13.9
Horizontal	*2488.120	39.7	35.6	37.2	41.3	54.0	-12.7

NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.9 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

- [] Not required - No digital part
- [] Test results are attached
- [x] Included in the separated report.

TEST REPORT

Intertek Report No.: GZHH00531672-002

Applicant: GUANGDONG HENGDI TECHNOLOGY CORP.,LTD.

Date of Test: Apr 19, 2024

Model: 1012254

4.10 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

TEST REPORT

Intertek Report No.: GZHH00531672-002

 11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	10-May-2023	10-May-2024
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	10-May-2023	10-May-2024
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	4-Aug-2021	4-Aug-2024
SZ185-04	EMI Receiver	R & S	ESR7	102466	10-Nov-2023	10-Nov-2024
SZ061-08	Horn Antenna	ETS	3115	00092346	5-Sep-2021	5-Sep-2024
SZ061-15	Double-Ridged Waveguide Horn Antenna	ETS	3116C-PA	00224718	6-Jul-2021	6-Jul-2024
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	18-May-2021	18-May-2024
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	10-May-2023	10-May-2024
SZ056-06	Spectrum Analyzer	R&S	FSV40	101101	13-Dec-2023	13-Dec-2024
SZ181-04	Preamplifier	Agilent	8449B	3008A0247 4	27-Apr-2023	27-Apr-2024
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	12-Dec-2021	12-Dec-2024
SZ062-02	RF Cable	RADIALL	RG 213U	--	1-Nov-2023	1-May -2024
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	1-Nov-2023	1-May -2024
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	1-Nov-2023	1-May -2024
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	27-Apr-2023	27-Apr-2024

**** End of Report ****