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TEST REPORT

KCTL Inc.
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

KCTL

1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 19 Chapin Rd. Building D Pine Brook NJ 07058
- Date of Receipt : 2017-12-27

2. Use of Report : -

3. Name of Product and Model : SMART READY / HD2018GH

4. Manufacturer and Country of Origin : Samsung Electronics Co., Ltd. / Korea

5. FCC ID : A3LHD2018GH

6. Date of Test : 2018-02-13 to 2018-02-21

7. Test Standards : FCC Part 15 Subpart C, 15.247

8. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Dowon Ahn (Signature)	Technical Manager Name : Jongha Choi (Signature)

2018-03-07

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2018-02-26	Originally issued	-
2018-03-07	Changed model name and DCCF results	Several page

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1. Client information

Applicant:	Samsung Electronics Co., Ltd.
Address:	19 Chapin Rd. Building D Pine Brook NJ 07058
Telephone number:	+82 10 9458 7426
Contact person:	Chan Ho Youn / jjano.youn@samsung.com

Manufacturer:	Samsung Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep.of Korea

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2. Laboratory information

Address

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

Telephone Number: 82 31 285 0894

Facsimile Number: 82 505 299 8311

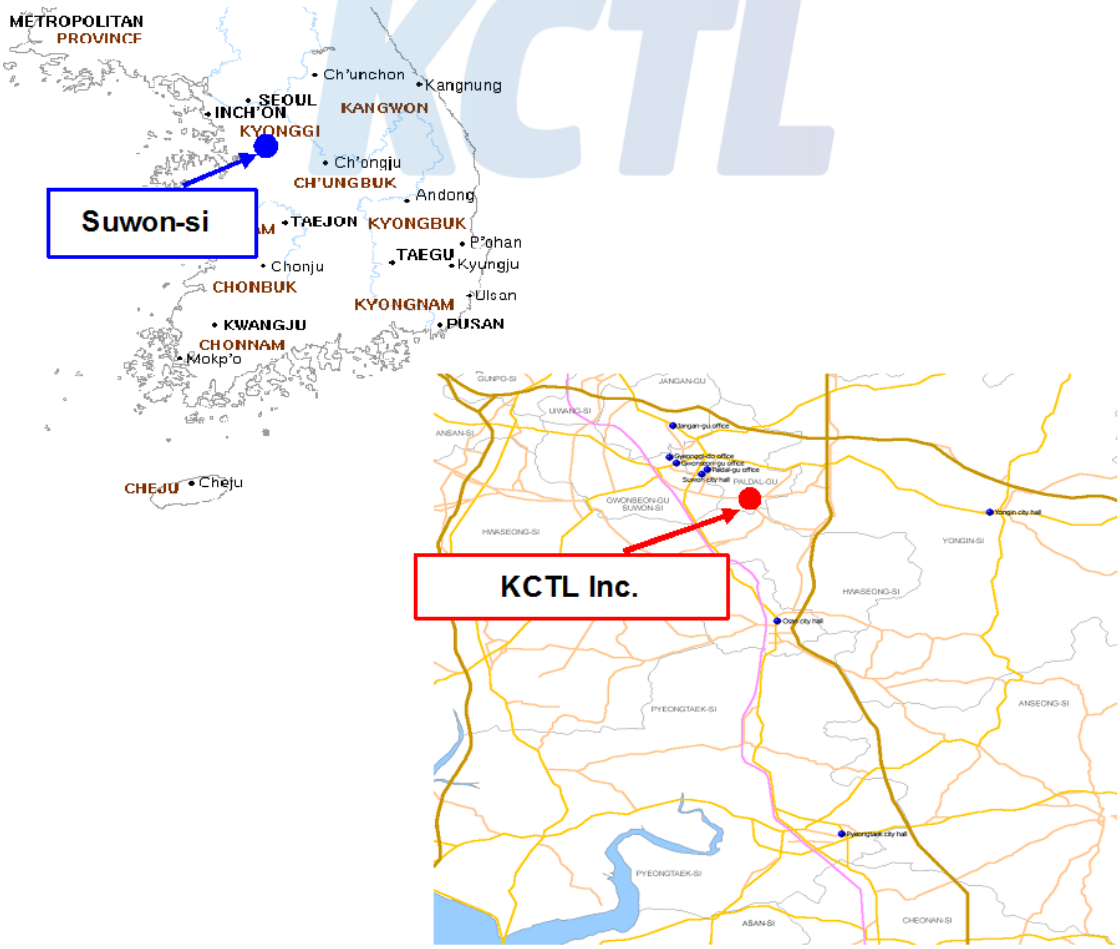
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No. : 8035A

KOLAS NO.: KT231

SITE MAP



3. Description of E.U.T.

3.1 Basic description

Applicant	Samsung Electronics Co., Ltd.
Address of Applicant	19 Chapin Rd. Building D Pine Brook NJ 07058
Manufacturer	Samsung Electronics Co., Ltd.
Address of Manufacturer	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep.of Korea
Type of equipment	SMART READY
Basic Model	HD2018GH
Serial number	N/A

3.2 General description

Frequency Range	2 412 ㎒ ~ 2 462 ㎒ (802.11b/g/n_HT20)
Type of Modulation	DSSS (802.11b), OFDM (802.11g/n_HT20)
The number of channels	11 ch (802.11b/g/n_HT20)
Type of Antenna	PIFA Antenna
Antenna Gain	2.22 ㏈i (2 400 ㎒ ~ 2 483.5 ㎒)
Transmit Power	17.57 ㏈m
Operation temperature	-10 ℃ ~ 50 ℃
Power supply	DC 5.00 V, DC 12.00 V
Product SW/HW version	180220 / 0.3
Radio SW/HW version	20171130 / 0.3
Test SW Version	ARTIK0051_DUTCTRL

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RF power setting in TEST SW	DC 5 V / DC 12 V 802.11b_2 412 ㎒ : 14 802.11b_2 437 ㎒ : 14 802.11b_2 462 ㎒ : 14 802.11g_2 412 ㎒ : 12 802.11g_2 437 ㎒ : 13 802.11g_2 462 ㎒ : 8 802.11n_HT20_2 412 ㎒ : 10 802.11n_HT20_2 437 ㎒ : 10 802.11n_HT20_2 462 ㎒ : 9

Note : The above EUT information was declared by the manufacturer.

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3.3 Ambient Conditions

	Temperature [℃]	Relative humidity [%]
Ambient Conditions	21	52

3.4 Test frequency

	802.11b/g/n_HT20
Lowest frequency	2 412 ㎒
Middle frequency	2 437 ㎒
Highest frequency	2 462 ㎒

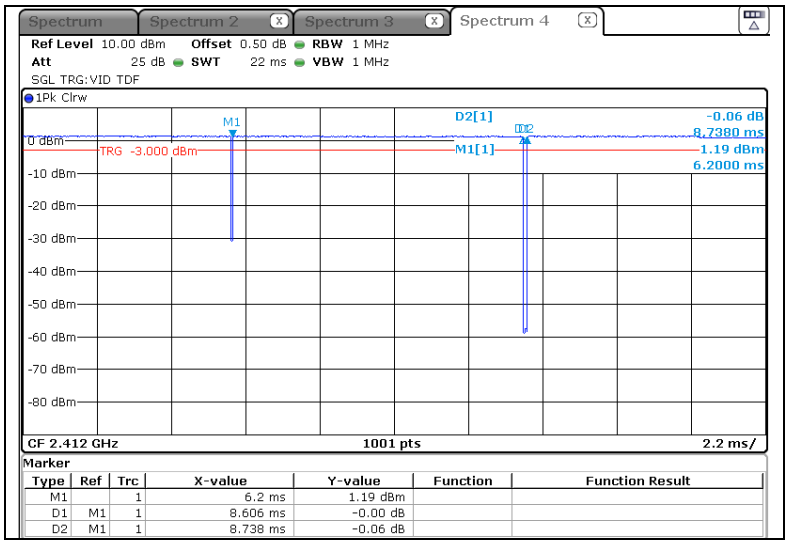
3.5 Test Voltage

Mode	Voltage
Nominal Voltage	DC 5.00 V, DC 12.00 V

3.6 Duty Cycle Correction Factor

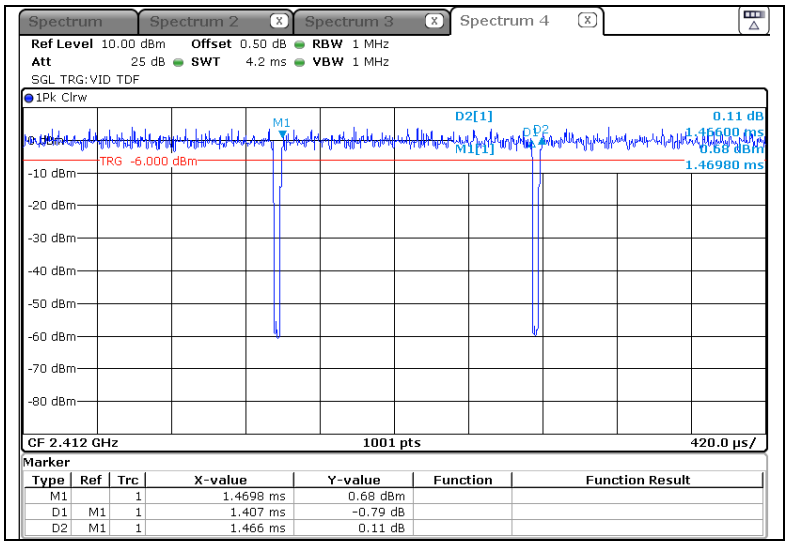
DC 5 V

- 802.11b



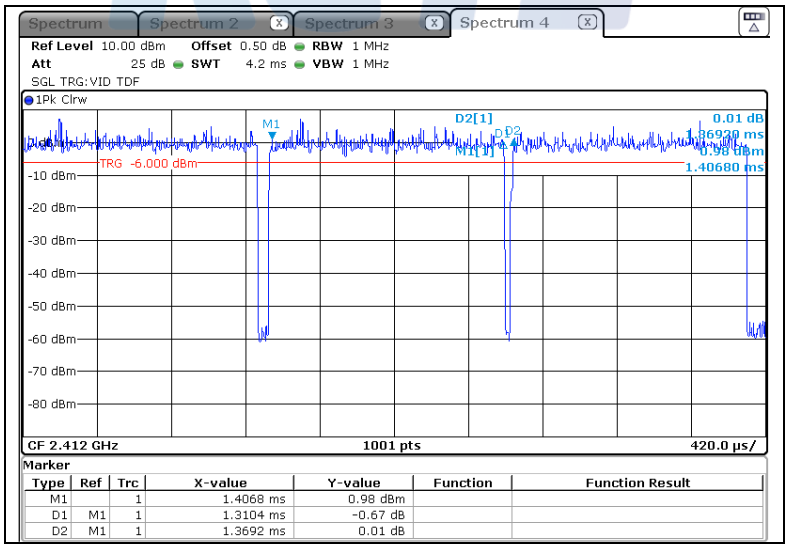
Note1) : period : 0.874 ms, On time : 0.861 ms
Note2) : DCCF = 10 log(1 / x) = 10 log(1 / 0.985) = 0.065 dB, x = 0.874 / 0.861 = 0.985
Note3) : 802.11b is a continuous transmission (duty cycle >=98 %)"

- 802.11g



Note1) : period : 0.147 ms, On time : 0.141 ms
Note2) : DCCF = 10 log(1 / x) = 10 log(1/0.959) = 0.181 dB, x = 0.141/0.147 = 0.959
Note3) : 802.11g is a continuous transmission (duty cycle <=98 %)"

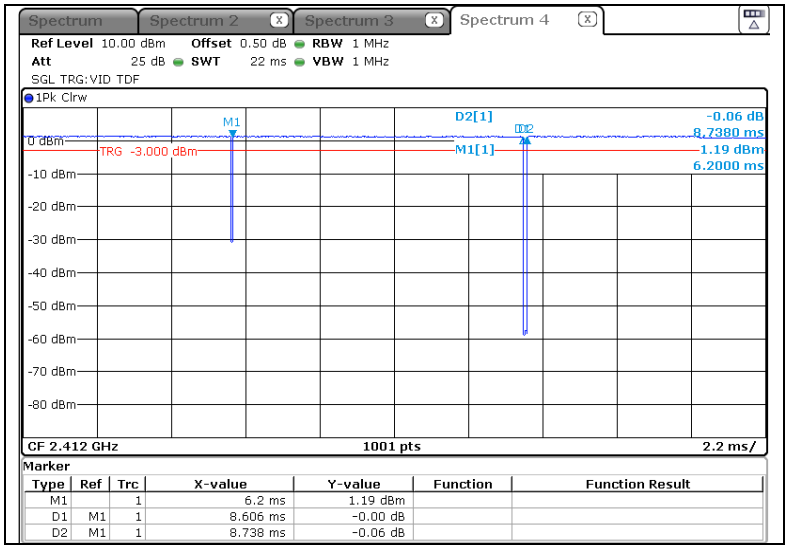
- 802.11n HT20



Note1) : period : 0.137 ms, On time : 0.131 ms
Note2) : DCCF = 10 log(1 / x) = 10 log(1/0.956) = 0.195 dB, x = 0.137/0.131 = 0.956
Note3) : 802.11n HT20 is a continuous transmission (duty cycle <=98 %)"

DC 12 V

- 802.11b

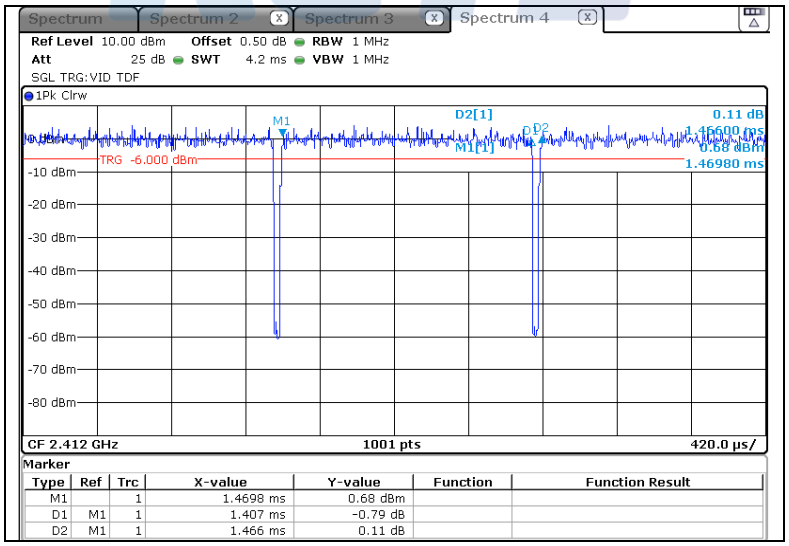


Note1) : period : 0.874 ms, On time : 0.861 ms

Note2) : DCCF = 10 log(1 / x) = 10 log(1 / 0.985) = 0.065 dB, x = 0.861 / 0.874 = 0.985

Note3) : 802.11b is a continuous transmission (duty cycle >=98 %)"

- 802.11g

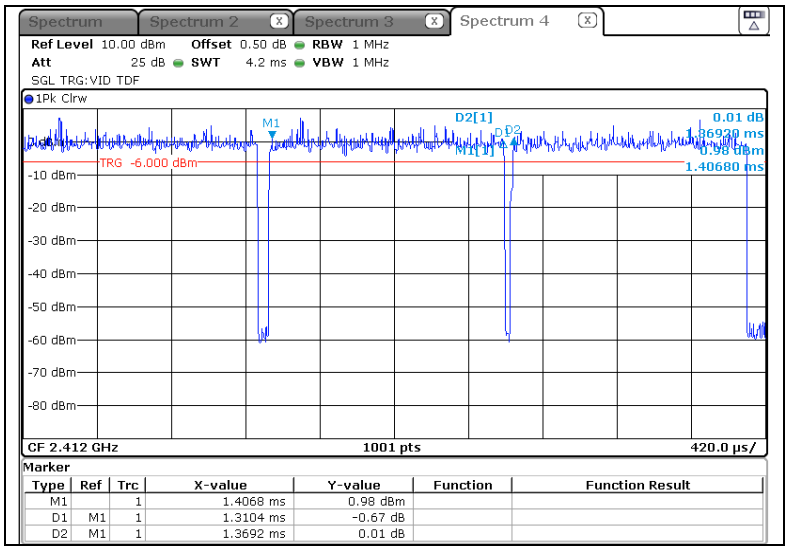


Note1) : period : 0.147 ms, On time : 0.141 ms

Note2) : DCCF = 10 log(1 / x) = 10 log(1/0.959) = 0.181 dB, x = 0.141/0.147 = 0.959

Note3) : 802.11g is a continuous transmission (duty cycle <=98 %)"

- 802.11n HT20



Note1) : period : 0.137 ms, On time : 0.131 ms
Note2) : DCCF = 10 log(1 / x) = 10 log(1/0.956) = 0.194 dB, x = 0.131/0.137 = 0.954
Note3) : 802.11n HT20 is a continuous transmission (duty cycle <=98 %)"

4. Summary of test results

4.1 Standards & results

FCC Rule Reference	Parameter	Report Section	Test Result
15.203, 15.247(b)(4)	Antenna Requirement	5.1	C
15.247(b)(3)	Maximum Peak Output Power	5.2	C
15.247(e)	Peak Power Spectral Density	5.3	C
15.247(a)(2)	6 dB Channel Bandwidth	5.4	C
-	Occupied Bandwidth	5.4	C
15.247(d),15.205(a),15.209(a)	Spurious Emission, Band Edge and Restricted bands	5.5	C
15.207(a)	Conducted Emissions	5.6	C
Note: C = complies, NC = Not complies, NT = Not tested, NA = Not Applicable			

4.2 Uncertainty

Measurement Item	Expanded Uncertainty U = *k*Uc (*k* = 2)	
Conducted RF power	1.44 dB	
Conducted Spurious Emissions	1.52 dB	
Radiated Spurious Emissions	30 MHz ~ 300 MHz:	+4.94 dB, -5.06 dB
		+4.93 dB, -5.05 dB
	300 MHz ~ 1 000 MHz:	+4.97 dB, -5.08 dB
		+4.84 dB, -4.96 dB
	1 GHz ~ 25 GHz:	+6.03 dB, -6.05 dB
Conducted Emissions	9 kHz ~ 150 kHz:	3.75 dB
	150 kHz ~ 30 MHz:	3.36 dB

5. Test results

5.1 Antenna Requirement

5.1.1 Regulation

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. 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.

And according to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.1.2 Result

-Complied

The transmitter has permanently attached PIFA Antenna (internal antenna) on board.

5.2 Maximum Peak Output Power

5.2.1 Regulation

According to §15.247(b)(3), For systems using digital modulation in the 902-928 ㎒, 2 400-2 483.5 ㎒, and 5 725-5 850 ㎒ bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 ㏈i. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 ㏈i are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

5.2.2 Measurement Procedure

These test measurement settings are specified in section 9.0 of 558074 D01 DTS Meas Guidance.

5.2.2.1 PKPM1 Peak-reading power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter.
The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

5.2.2.3 bandwidth (99%) measurement procedure

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

5.2.3 Test Result

- Complied

- DC 5 V

- 802.11b

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	13.97	30.00	16.03	11.81
Middle	2 437	13.37	30.00	16.63	11.01
Highest	2 462	13.07	30.00	16.93	10.76

- 802.11g

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	17.57	30.00	12.61	8.51
Middle	2 437	17.57	30.00	12.61	9.50
Highest	2 462	12.66	30.00	17.52	4.19

- 802.11n HT20

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	16.27	30.00	13.92	7.26
Middle	2 437	15.37	30.00	14.82	6.39
Highest	2 462	14.17	30.00	16.02	5.01

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

- DC 12 V

- 802.11b

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	14.07	30.00	15.93	11.90
Middle	2 437	13.47	30.00	16.53	10.88
Highest	2 462	13.17	30.00	16.83	10.87

- 802.11g

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	17.37	30.00	12.81	9.07
Middle	2 437	17.37	30.00	12.81	9.28
Highest	2 462	12.56	30.00	17.62	4.14

- 802.11n HT20

Channel	Frequency [㎒]	Result [dBm]	Limit [dBm]	Margin [dB]	Average power [dBm]
Lowest	2 412	16.07	30.00	14.12	7.10
Middle	2 437	15.27	30.00	14.92	6.41
Highest	2 462	14.07	30.00	16.12	4.91

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

5.3 Peak Power Spectral Density

5.3.1 Regulation

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 ㎑ band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3.2 Measurement Procedure

These test measurement settings are specified in section 10.0 of 558074 D01 DTS Meas Guidance.

5.3.2.1 Method PKPSD (peak PSD)

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

1) Set analyzer center frequency to DTS channel center frequency.

2) Set the span to 1.5 times the DTS bandwidth.

3) Set the RBW to: 3 ㎑ ≤ RBW ≤ 100 ㎑.

4) Set the VBW ≥ 3 x RBW.

5) Detector = peak.

6) Sweep time = auto couple.

7) Trace mode = max hold.

8) Allow trace to fully stabilize.

9) Use the peak marker function to determine the maximum amplitude level within the RBW.

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

5.3.3 Test Result

- Complied

- DC 5 V

- 802.11b

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-11.92	8.00	19.92
Middle	2 437	-12.22	8.00	20.22
Highest	2 462	-12.69	8.00	20.69

- 802.11g

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-15.59	8.00	23.59
Middle	2 437	-15.82	8.00	23.82
Highest	2 462	-19.47	8.00	27.47

- 802.11n HT20

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-15.92	8.00	23.92
Middle	2 437	-16.43	8.00	24.43
Highest	2 462	-17.28	8.00	25.28

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

- DC 12 V

- 802.11b

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-11.99	8.00	19.99
Middle	2 437	-12.19	8.00	20.19
Highest	2 462	-12.67	8.00	20.67

- 802.11g

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-15.45	8.00	23.45
Middle	2 437	-15.52	8.00	23.52
Highest	2 462	-19.27	8.00	27.27

- 802.11n HT20

Channel	Frequency [㎒]	Result [dB m/3 ㎑]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-17.41	8.00	25.41
Middle	2 437	-17.30	8.00	25.30
Highest	2 462	-18.18	8.00	26.18

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

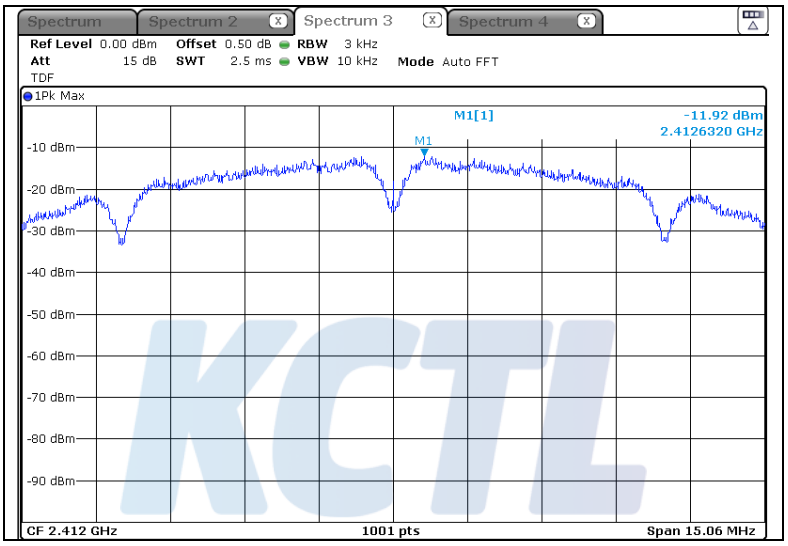
5.3.4 Test Plot

Figure 1. Plot of the Power Density

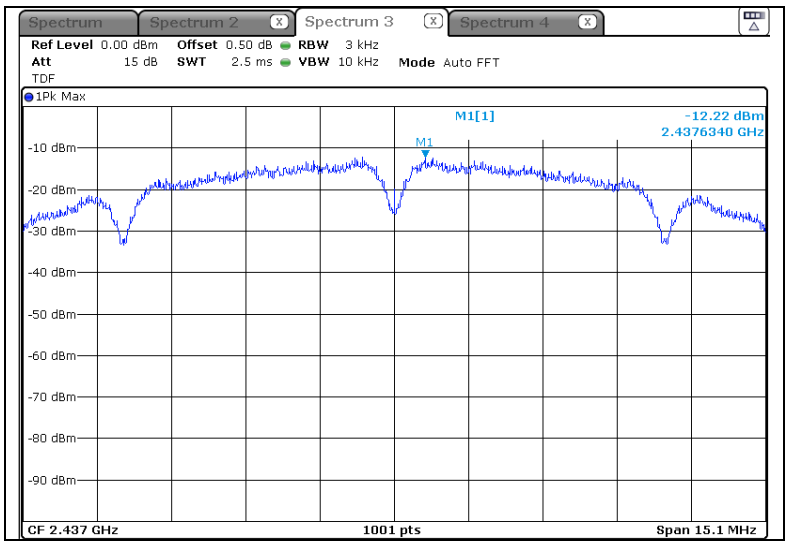
- DC 5 V

- 802.11b

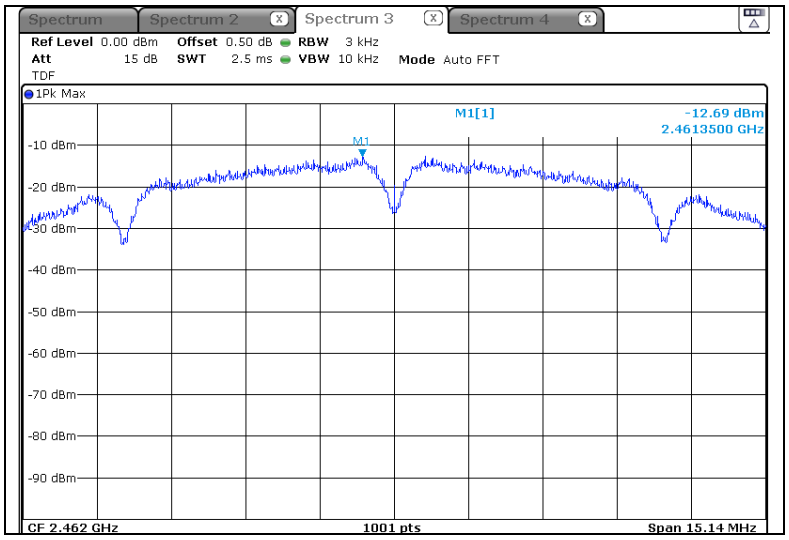
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

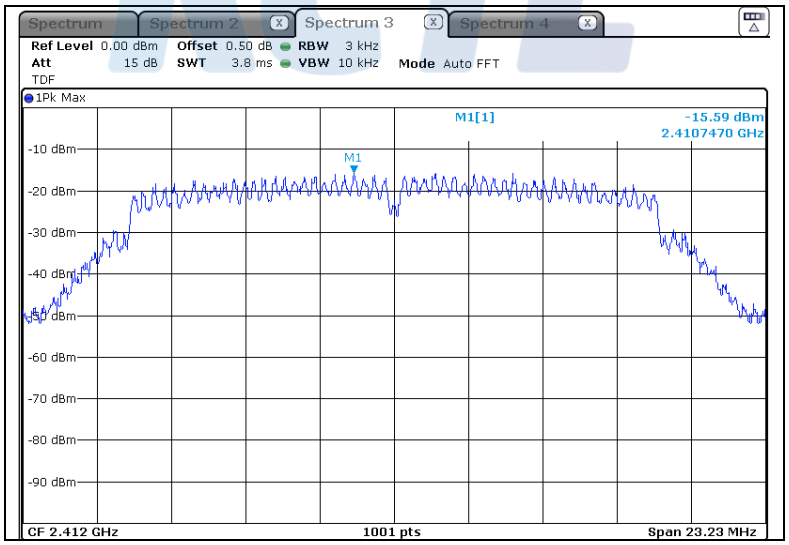


Highest Channel (2 462 ㎒)

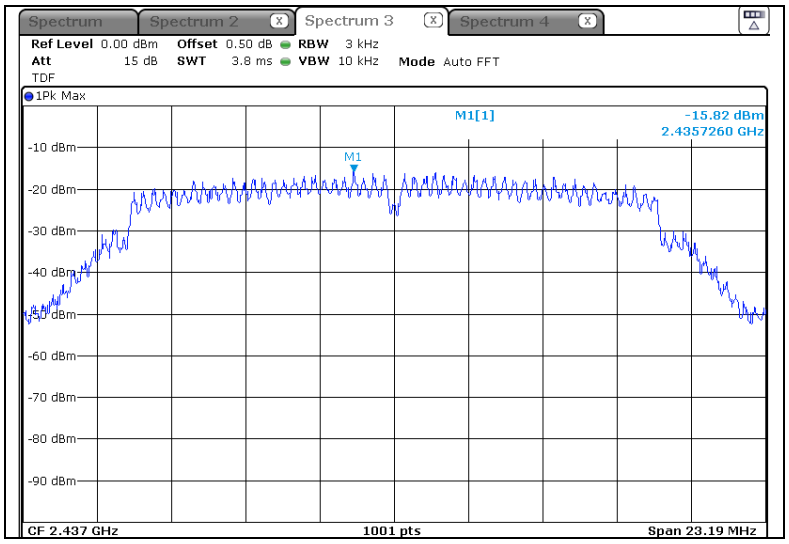


- 802.11g

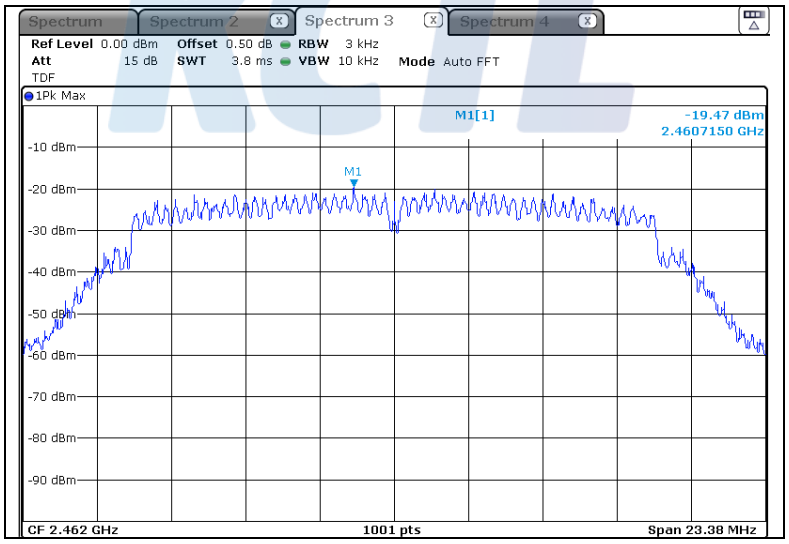
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

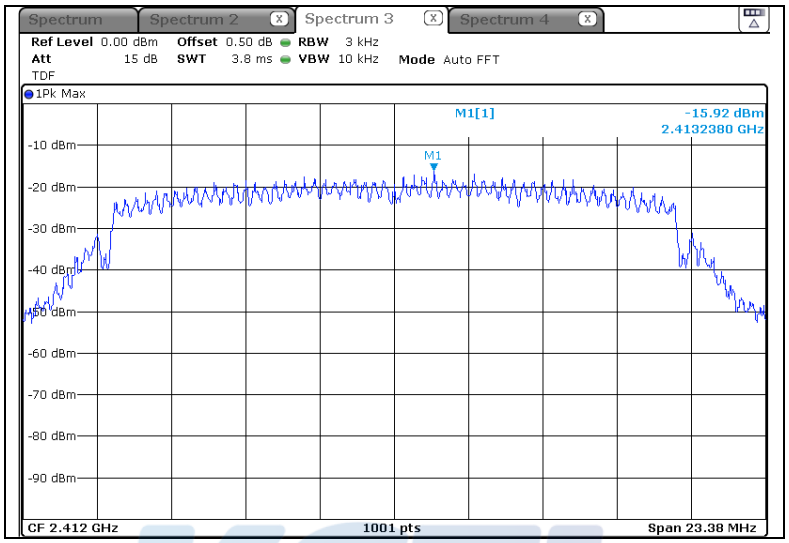


Highest Channel (2 462 ㎒)

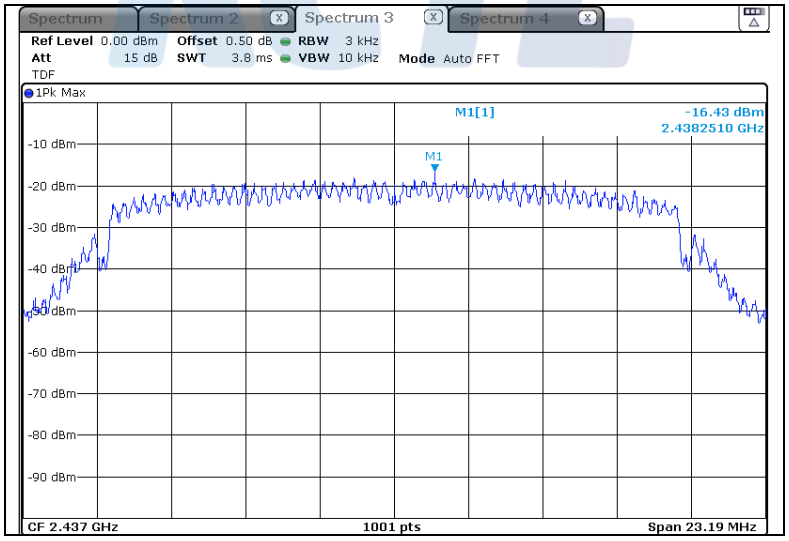


- 802.11n HT20

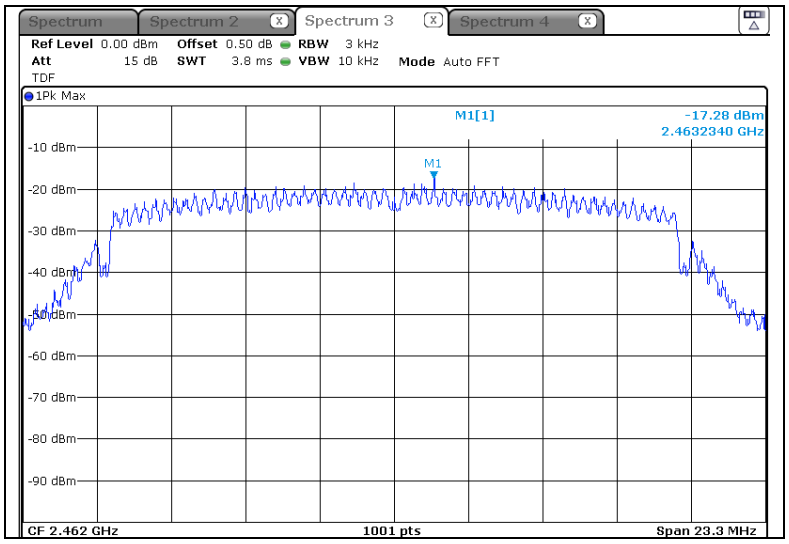
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



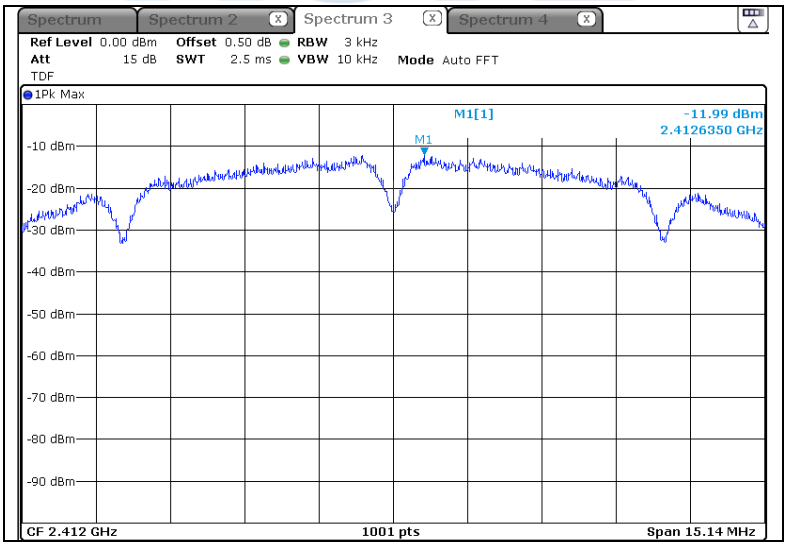
Highest Channel (2 462 ㎒)



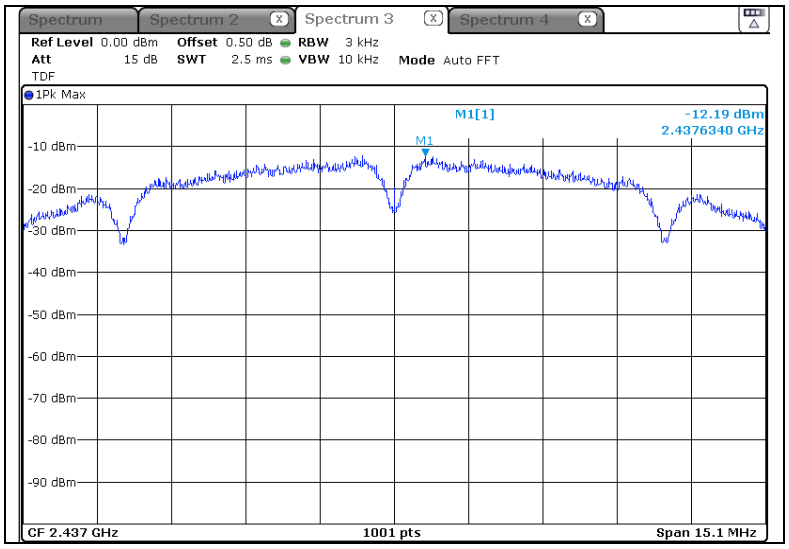
- DC 12 V

- 802.11b

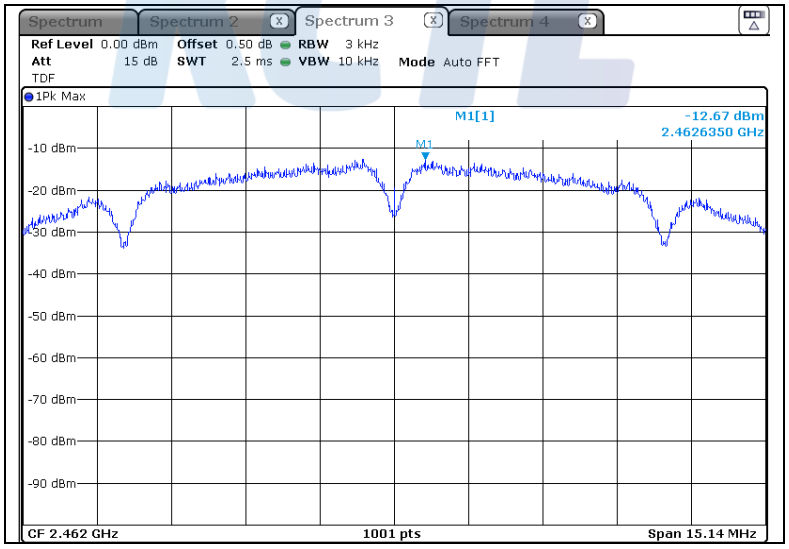
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

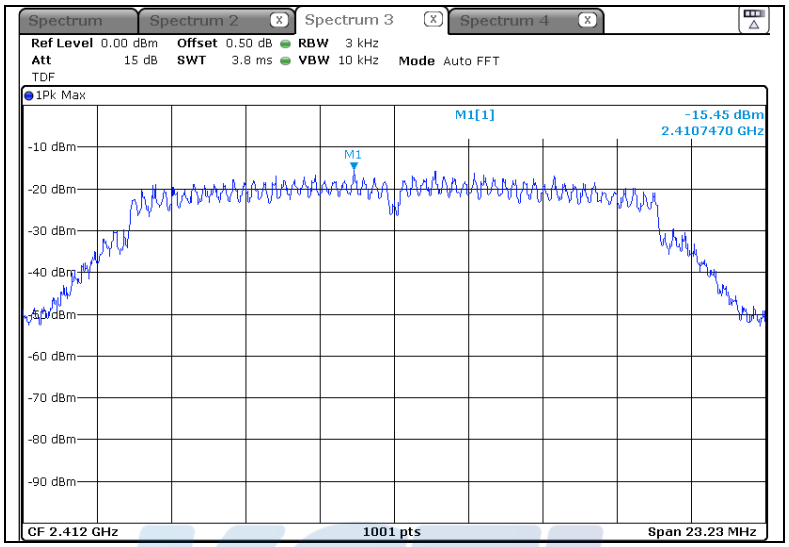


Highest Channel (2 462 ㎒)

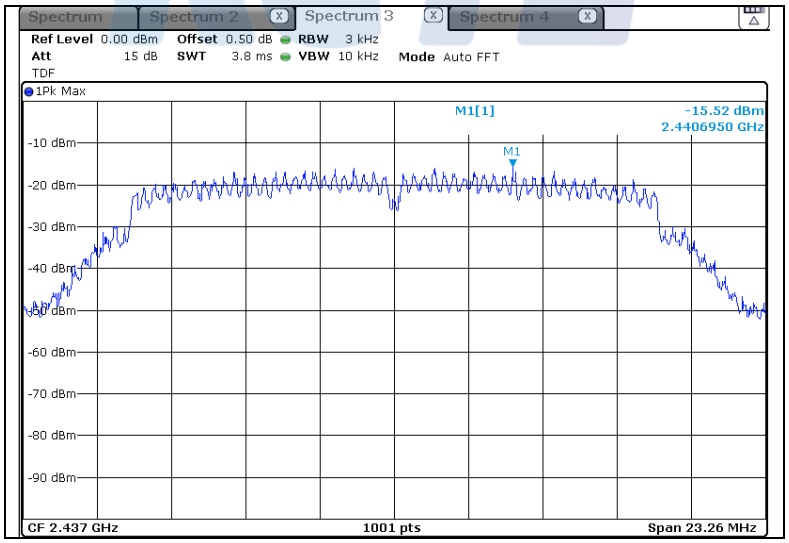


- 802.11g

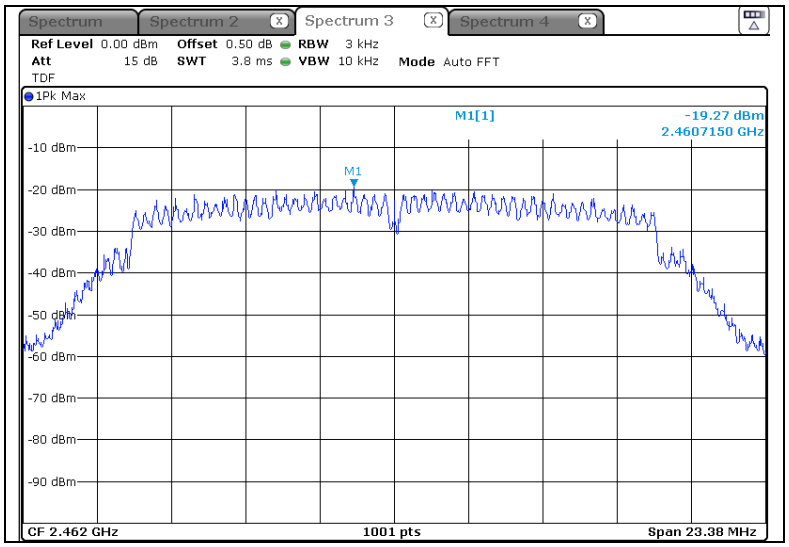
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

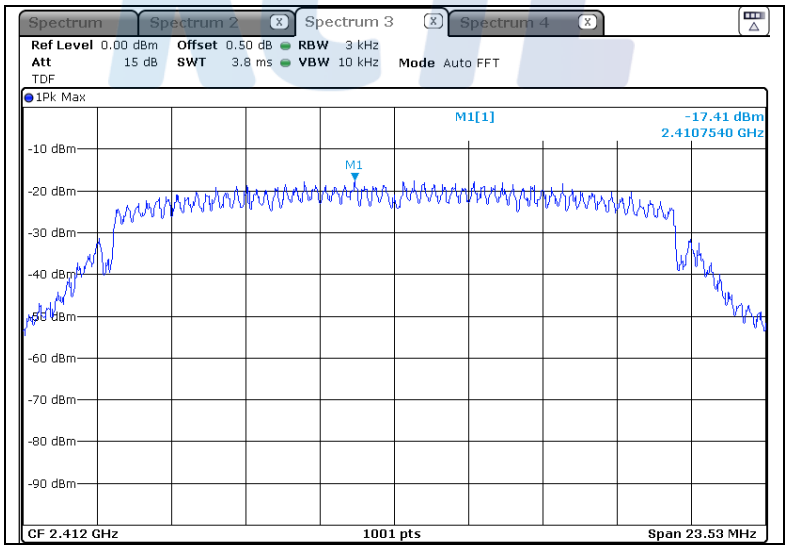


Highest Channel (2 462 ㎒)

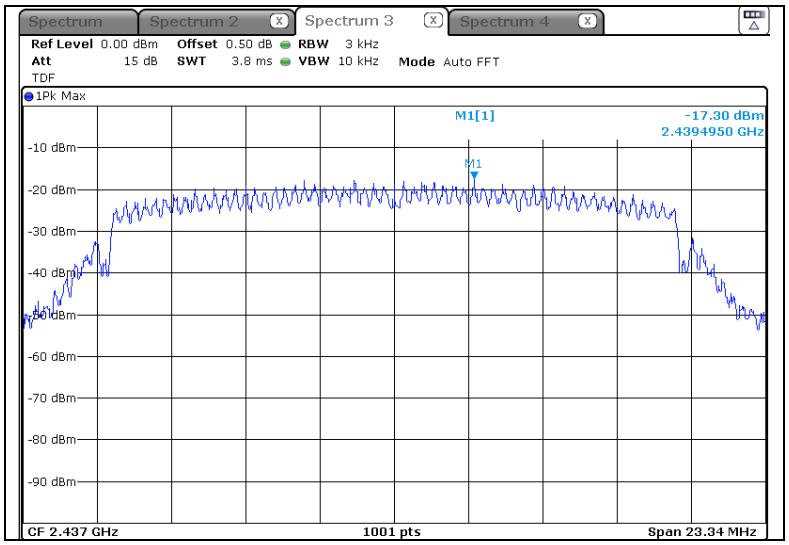


- 802.11n HT20

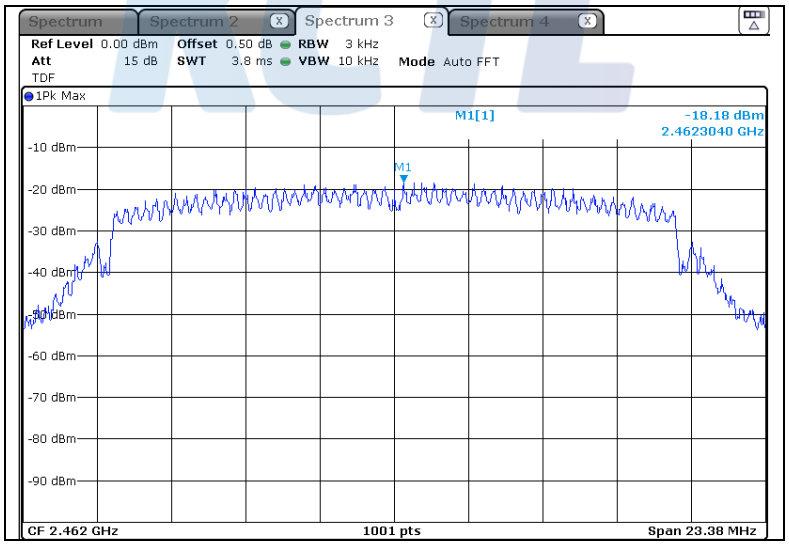
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



Highest Channel (2 462 ㎒)



5.4 6 dB Bandwidth(DTS Channel Bandwidth)

5.4.1 Regulation

According to §15.247(a)(2) Systems using digital modulation techniques may operate in the 902–928 ㎒, 2 400–2 483.5 ㎒, and 5 725–5 850 ㎒ bands. The minimum 6 ㏈ bandwidth shall be at least 500 ㎑.

5.4.2 Measurement Procedure

These test measurement settings are specified in section 8.0 of 558074 D01 DTS Meas Guidance.

5.4.2.1 DTS Channel Bandwidth-Option 1

1) Set RBW = 100 ㎑.
2) Set the video bandwidth (VBW) ≥ 3 x RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Sweep = auto couple.
6) Allow the trace to stabilize.
7) 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 ㏈ relative to the maximum level measured in the fundamental emission.

5.4.2.2 bandwidth (99%) measurement procedure

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

This test report shall not be reproduced, except in full, without the written approval

5.4.3 Test Result

- Complied

- DC 5 V

- 802.11b

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Min. Limit [MHz]	Occupied Bandwidth (99 % BW) [MHz]
Lowest	2 412	10.04	0.50	14.54
Middle	2 437	10.07	0.50	14.59
Highest	2 462	10.09	0.50	14.54

- 802.11g

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Min. Limit [MHz]	Occupied Bandwidth (99 % BW) [MHz]
Lowest	2 412	15.49	0.50	18.58
Middle	2 437	15.46	0.50	18.43
Highest	2 462	15.58	0.50	18.43

- 802.11n HT20

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Min. Limit [MHz]	Occupied Bandwidth (99 % BW) [MHz]
Lowest	2 412	15.58	0.50	19.53
Middle	2 437	15.46	0.50	19.68
Highest	2 462	15.53	0.50	19.53

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

- DC 12 V

- 802.11b

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	10.09	0.50	14.59
Middle	2 437	10.07	0.50	14.59
Highest	2 462	10.09	0.50	14.54

- 802.11g

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	15.49	0.50	18.53
Middle	2 437	15.51	0.50	18.58
Highest	2 462	15.58	0.50	18.28

- 802.11n HT20

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	15.68	0.50	19.53
Middle	2 437	15.56	0.50	19.28
Highest	2 462	15.58	0.50	19.43

NOTE:
1. We took the insertion loss of the cable loss into consideration within the measuring instrument.

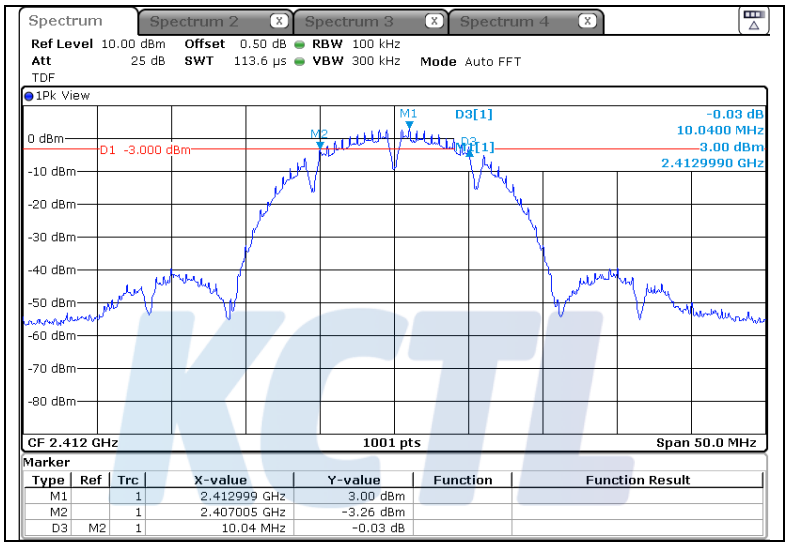
5.4.4 Test Plot

Figure 2. Plot of the 6 ㏈ Bandwidth & Occupied Bandwidth

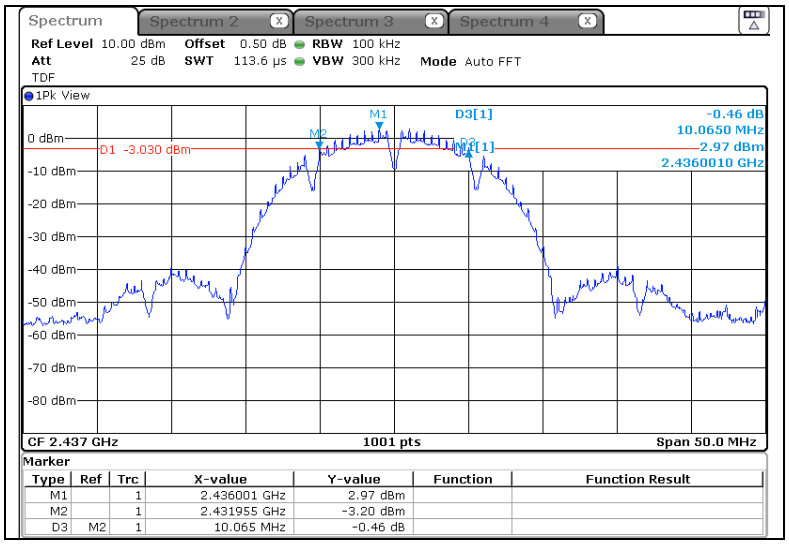
- DC 5 V

- 802.11b_6 ㏈ Bandwidth

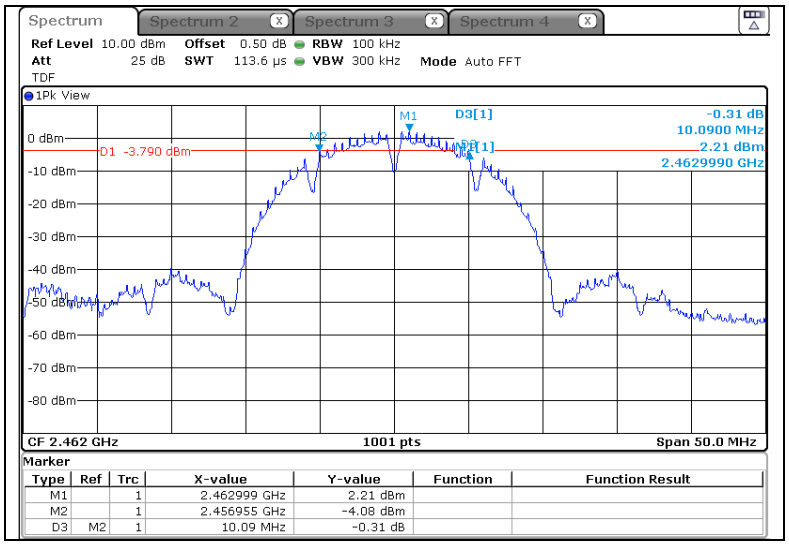
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

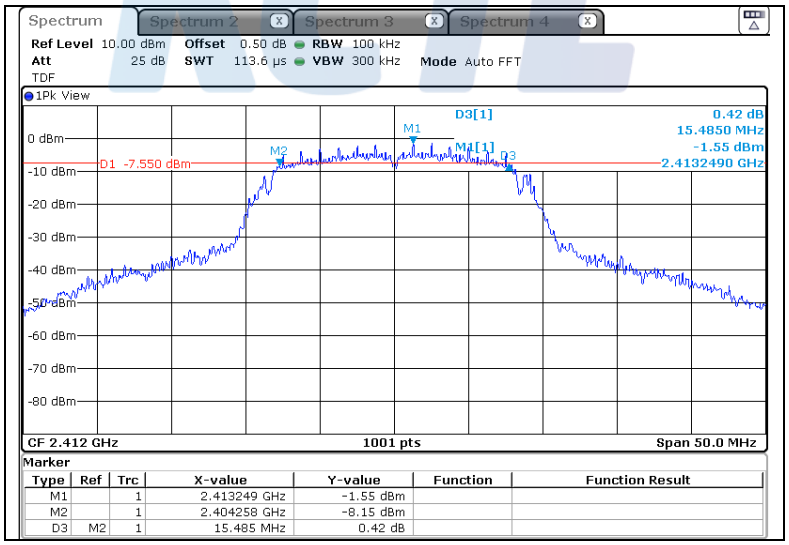


Highest Channel (2 462 ㎒)

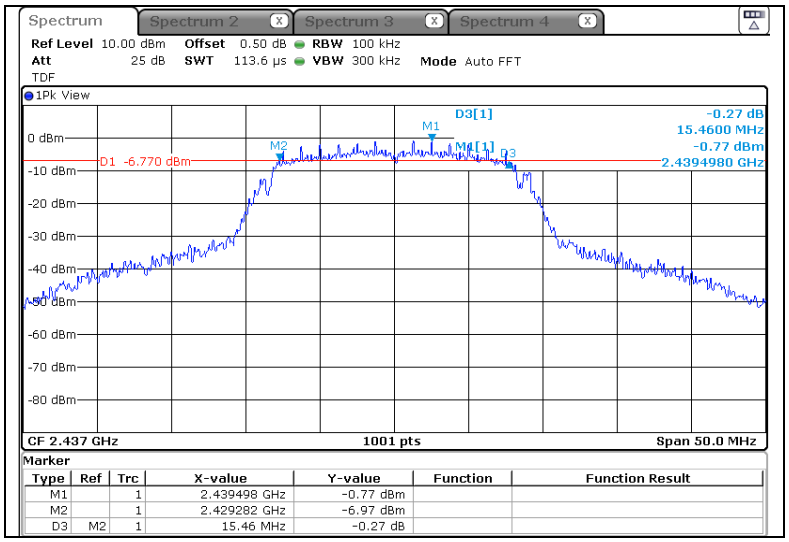


- 802.11g_6 ㏈ Bandwidth

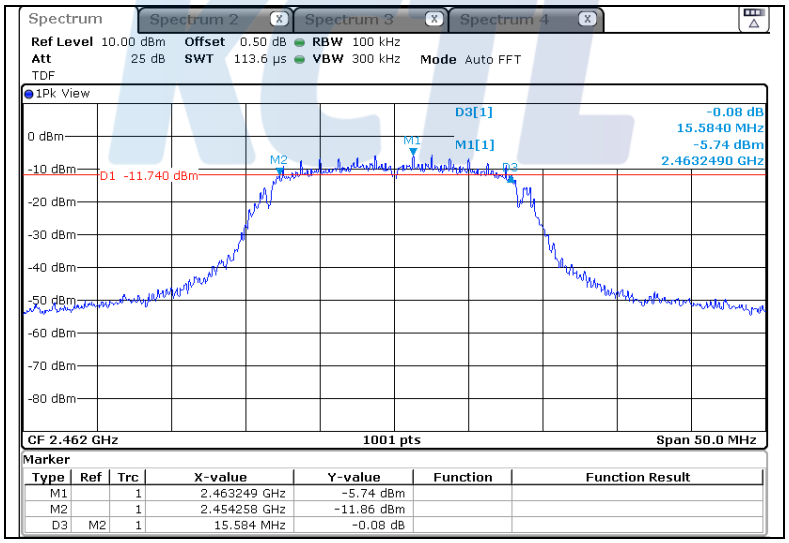
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

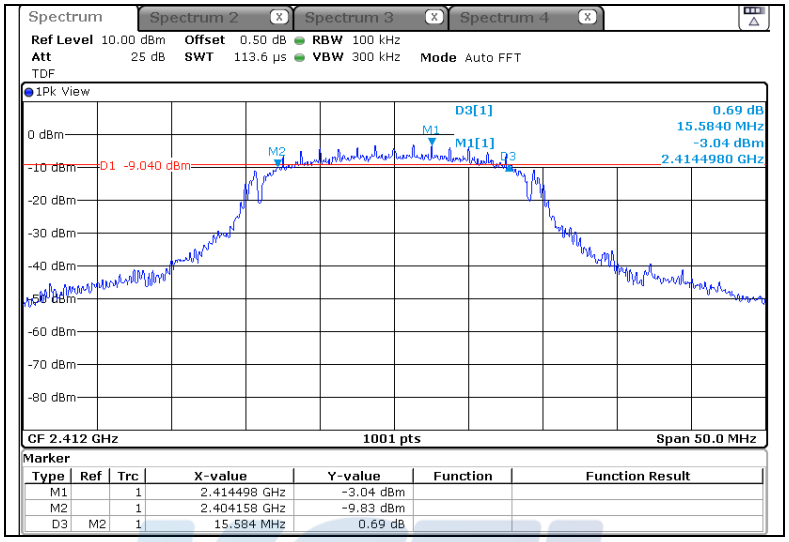


Highest Channel (2 462 ㎒)

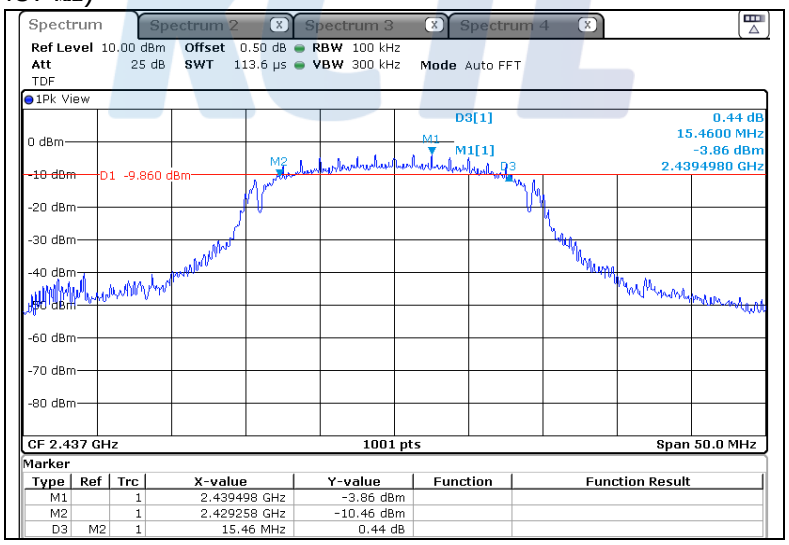


- 802.11n HT20_6 ㏈ Bandwidth

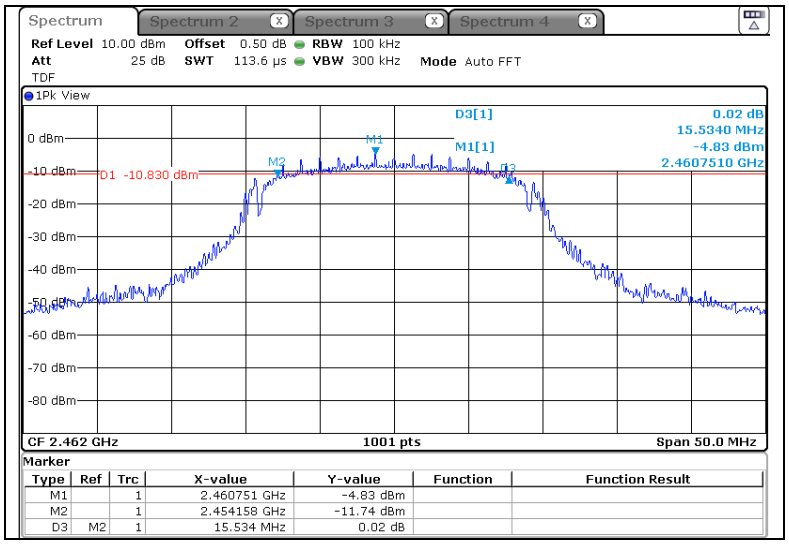
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

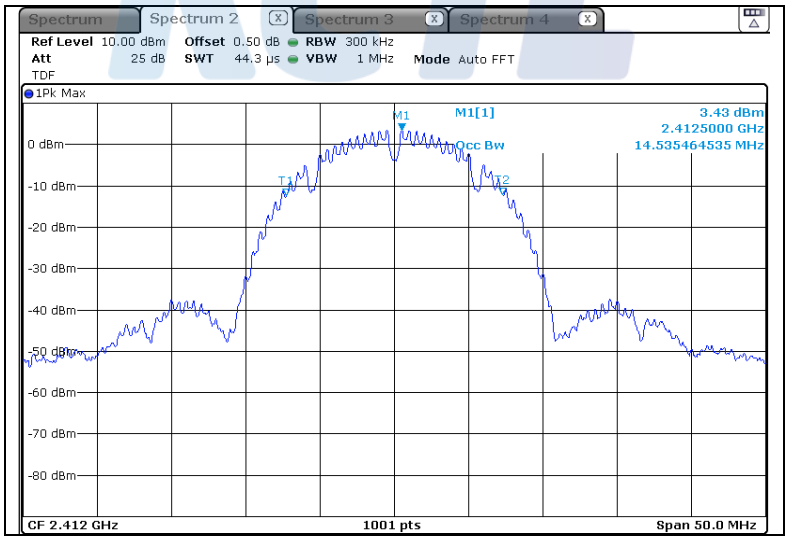


Highest Channel (2 462 ㎒)

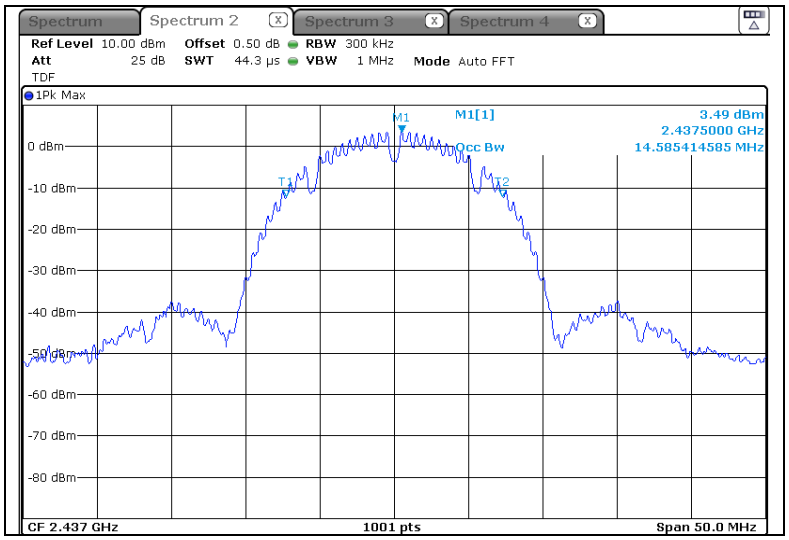


- 802.11b_Occupied Bandwidth

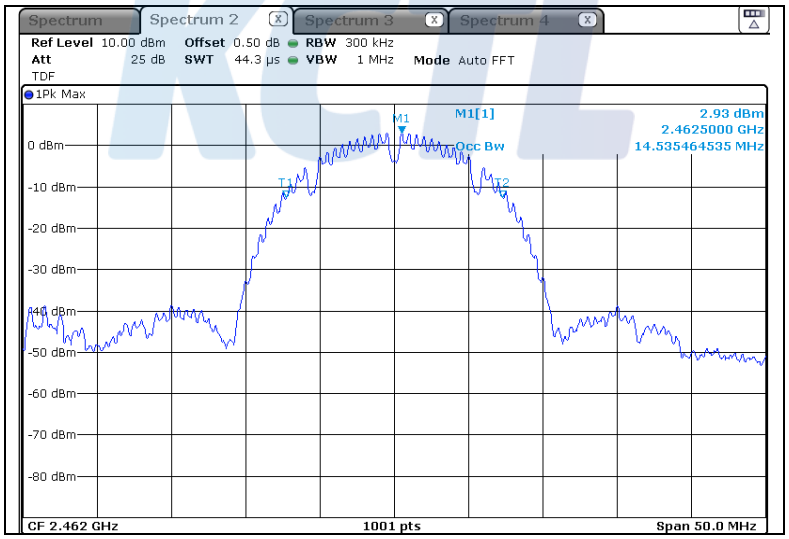
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

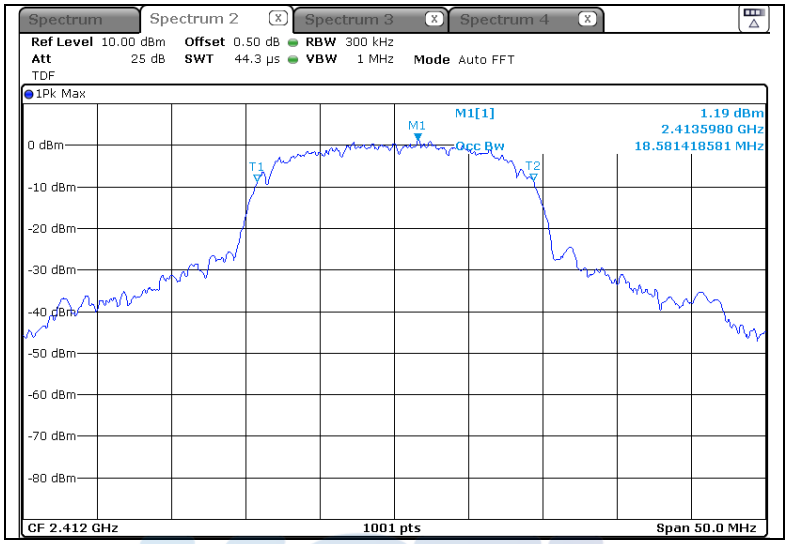


Highest Channel (2 462 ㎒)

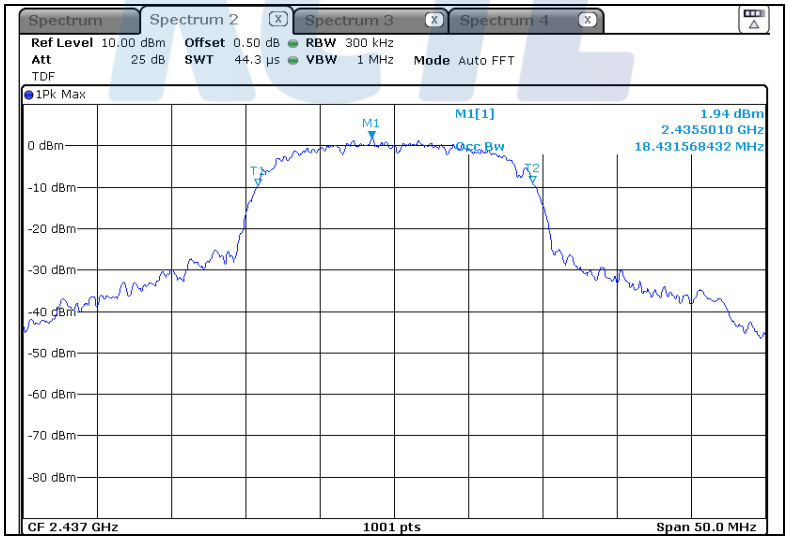


- 802.11g_Occupied Bandwidth

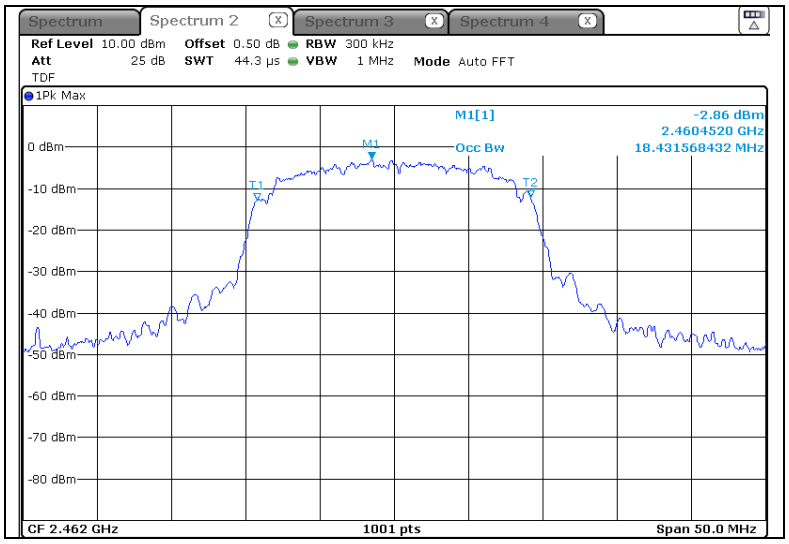
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

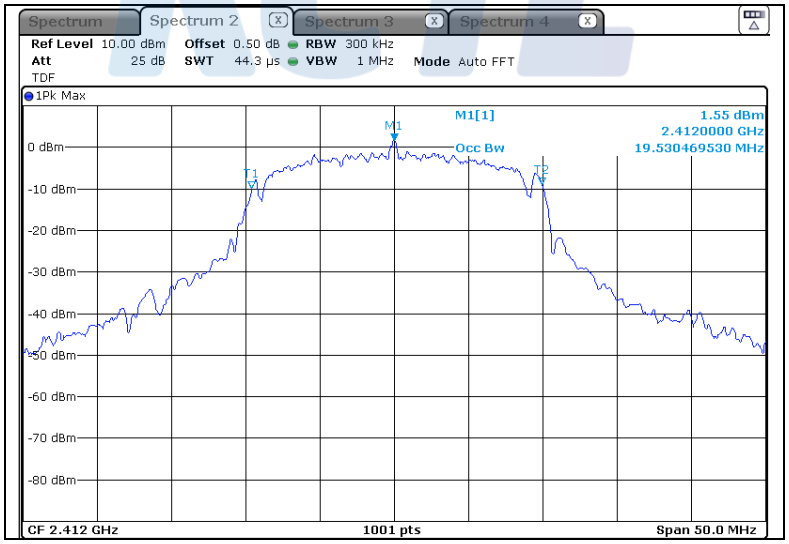


Highest Channel (2 462 ㎒)

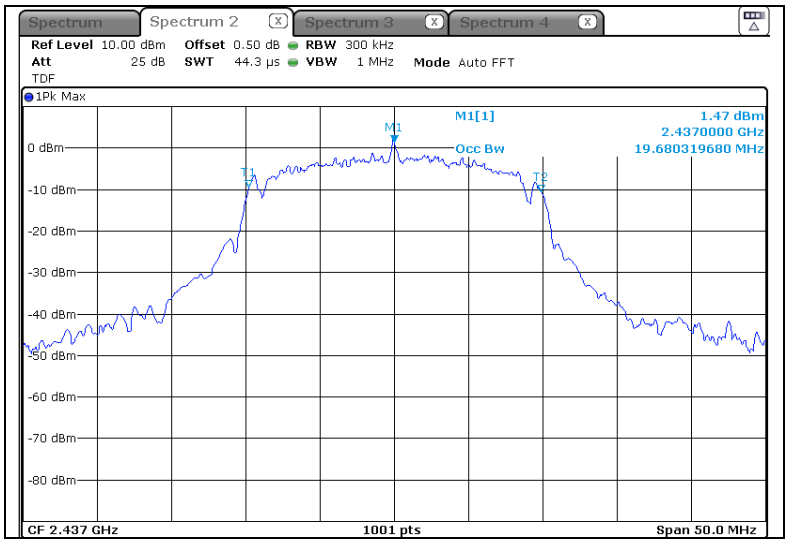


- 802.11n HT20_Occupied Bandwidth

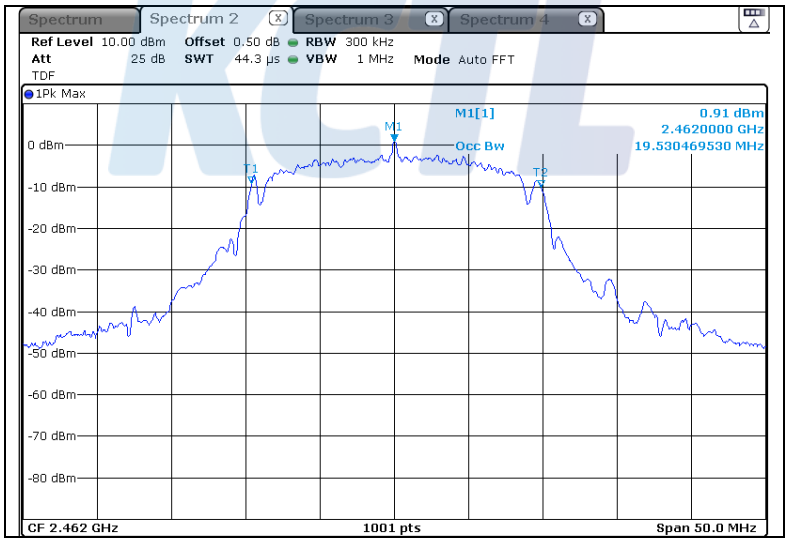
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



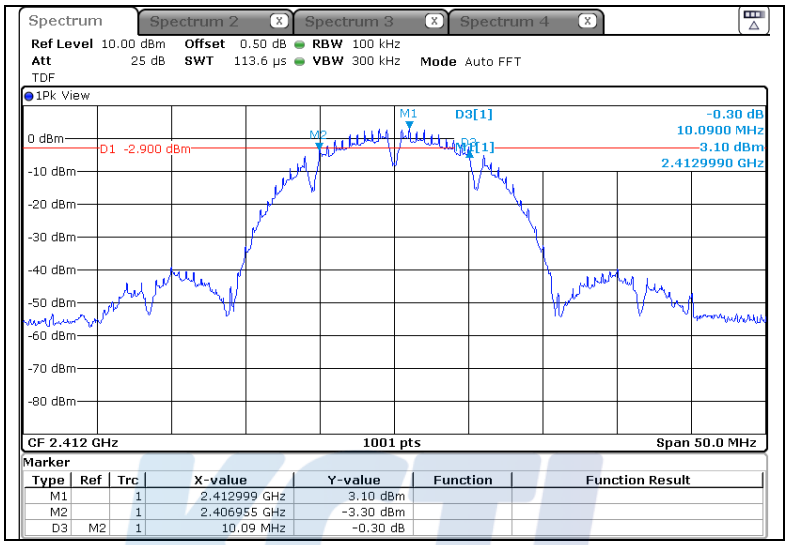
Highest Channel (2 462 ㎒)



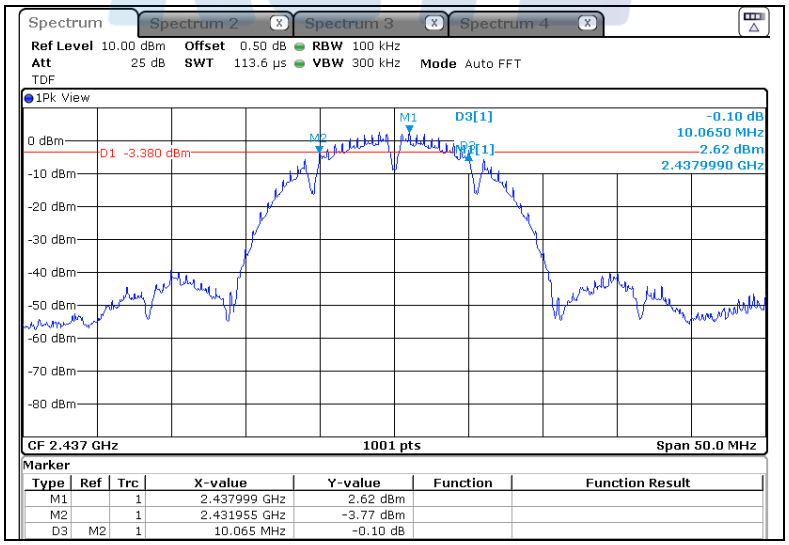
- DC 12 V

- 802.11b_6 dB Bandwidth

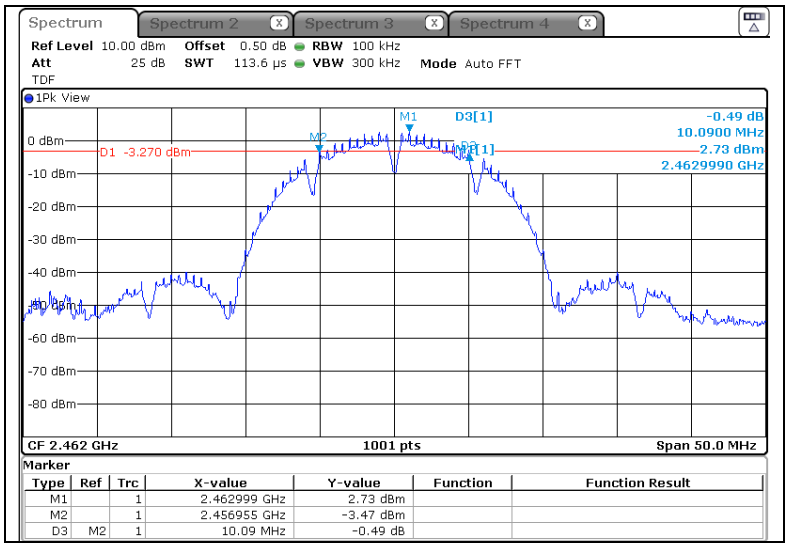
Lowest Channel (2 412 MHz)



Middle Channel (2 437 MHz)

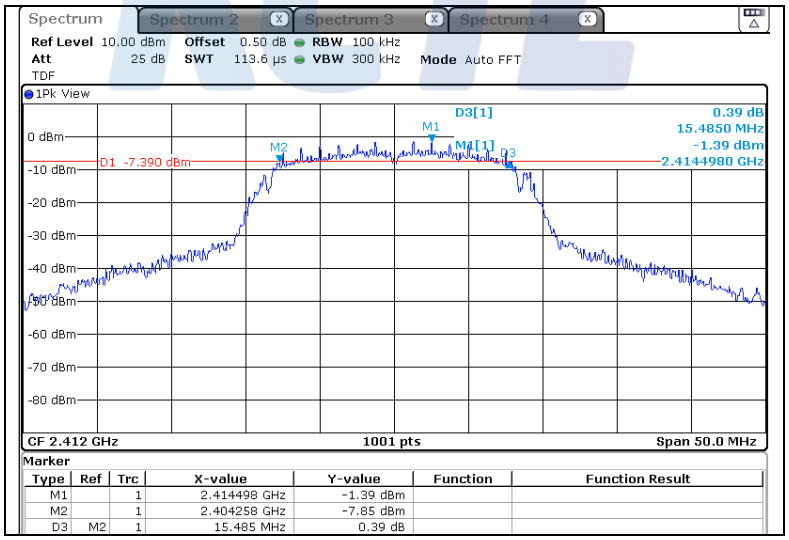


Highest Channel (2 462 ㎒)

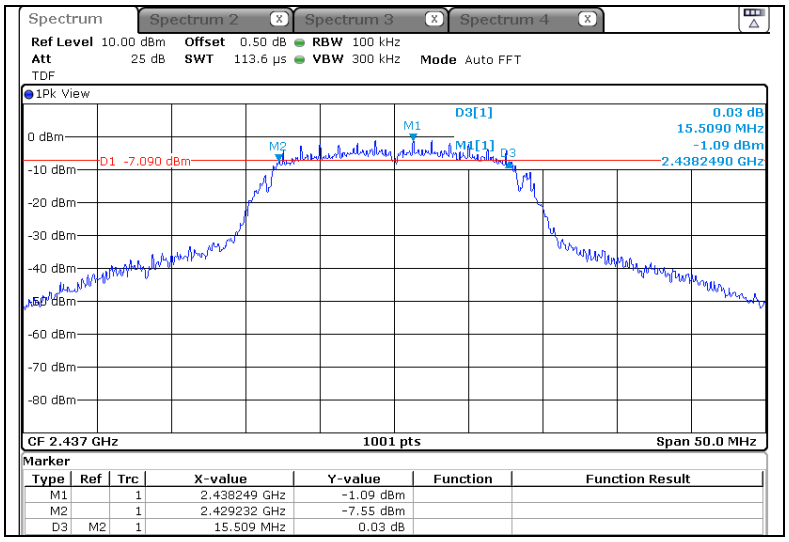


- 802.11g_6 ㏈ Bandwidth

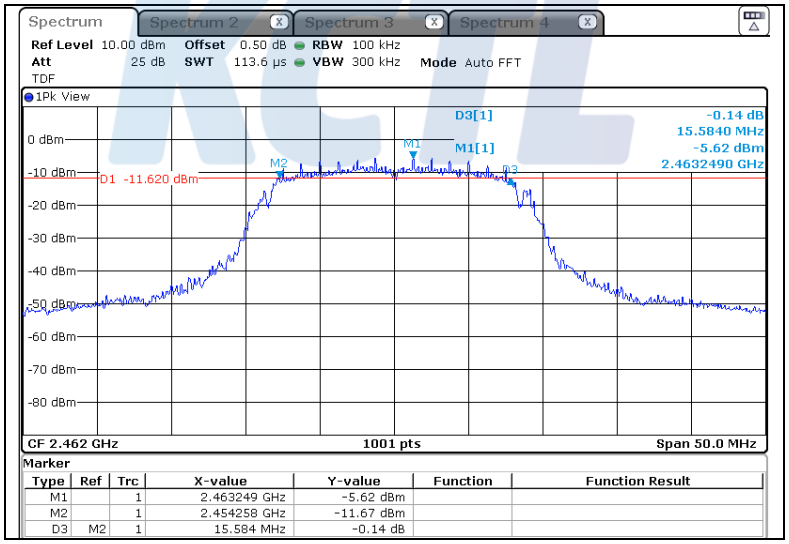
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

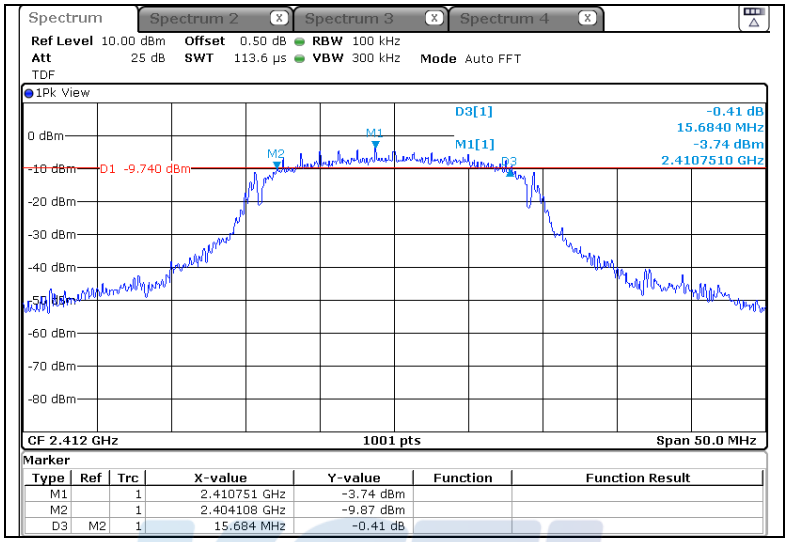


Highest Channel (2 462 ㎒)

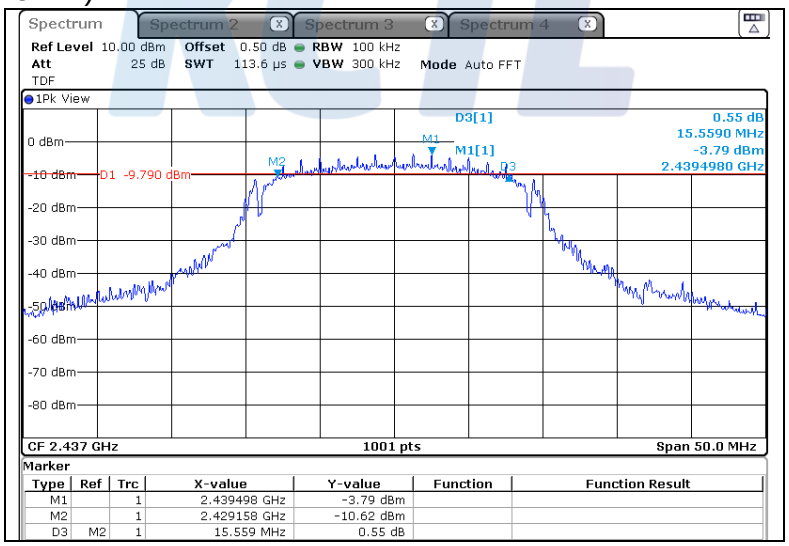


- 802.11n HT20_6 ㏈ Bandwidth

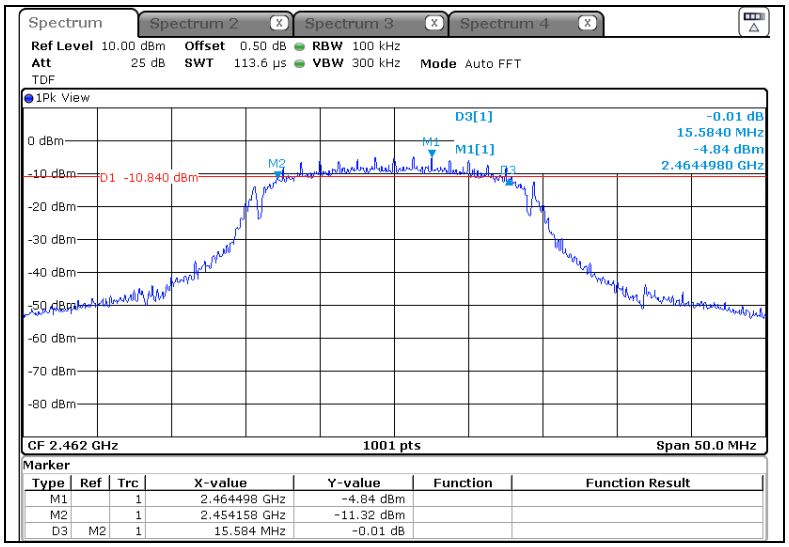
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

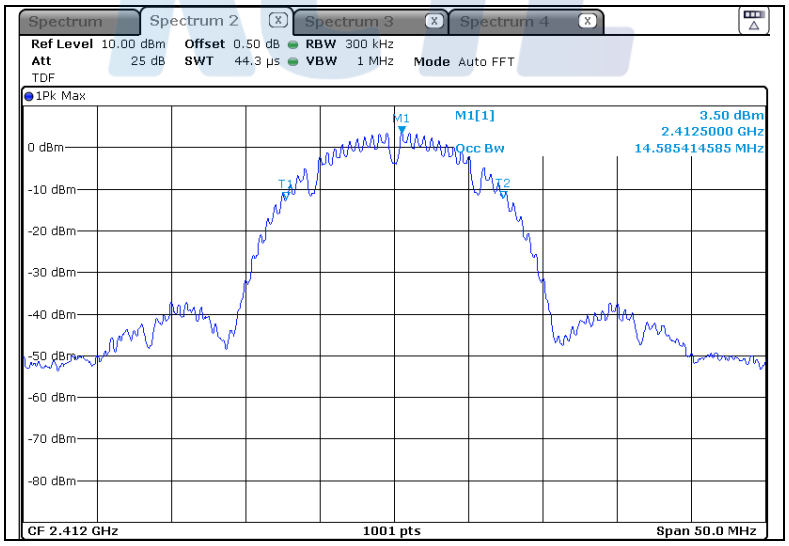


Highest Channel (2 462 ㎒)

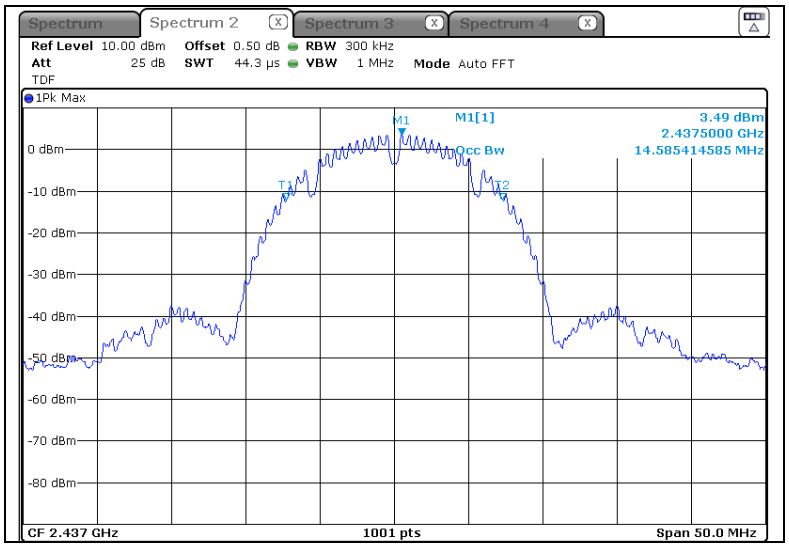


- 802.11b_Occupied Bandwidth

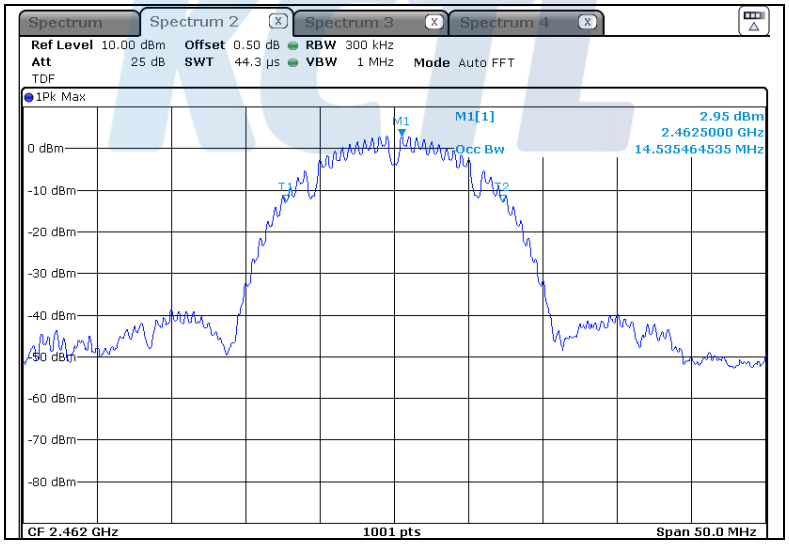
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

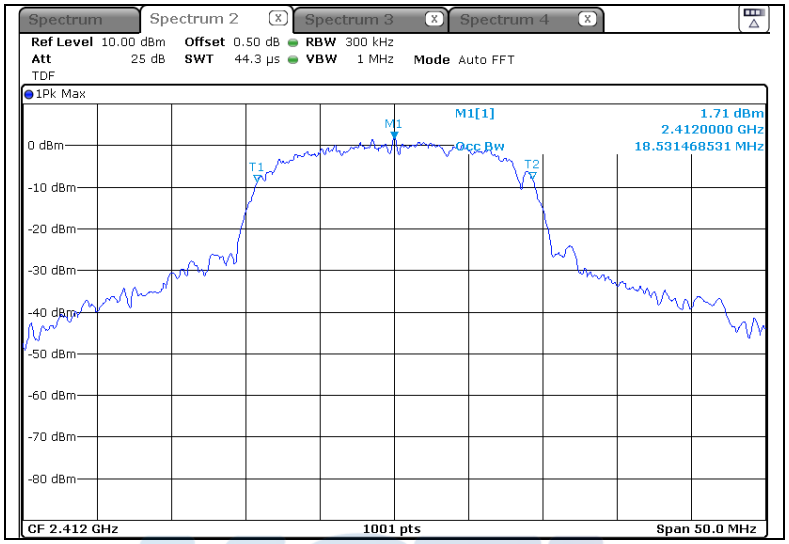


Highest Channel (2 462 ㎒)

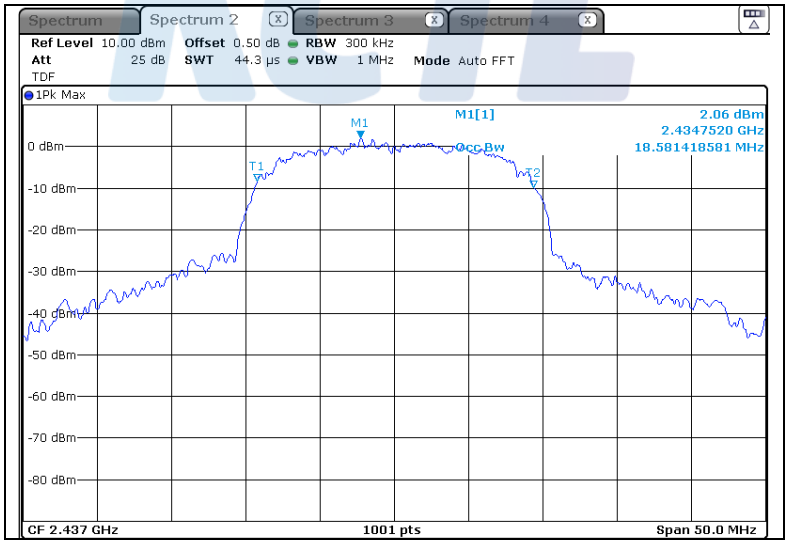


- 802.11g_Occupied Bandwidth

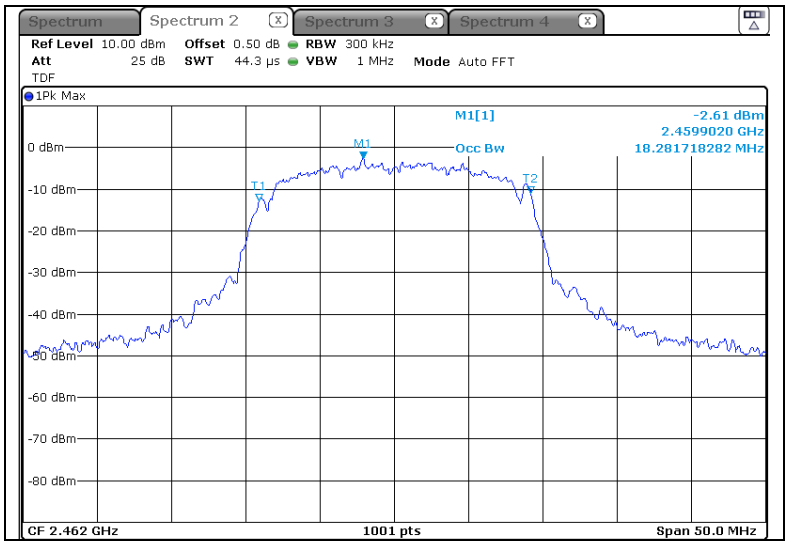
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

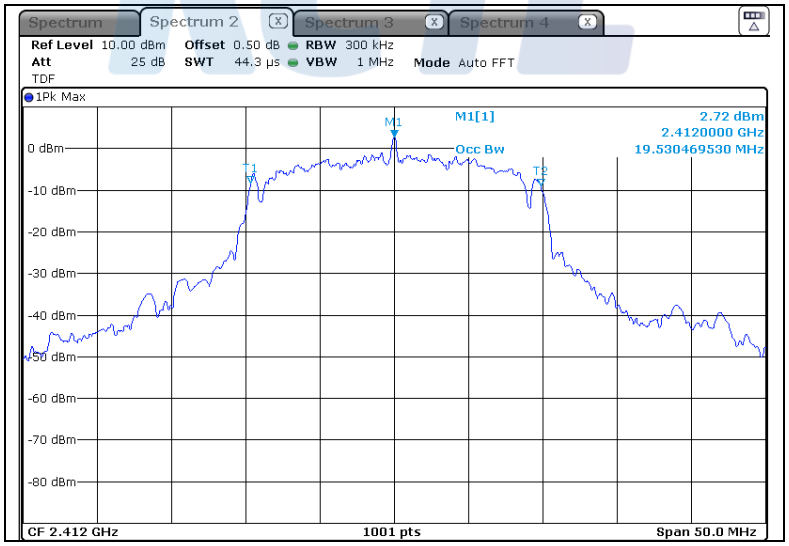


Highest Channel (2 462 ㎒)

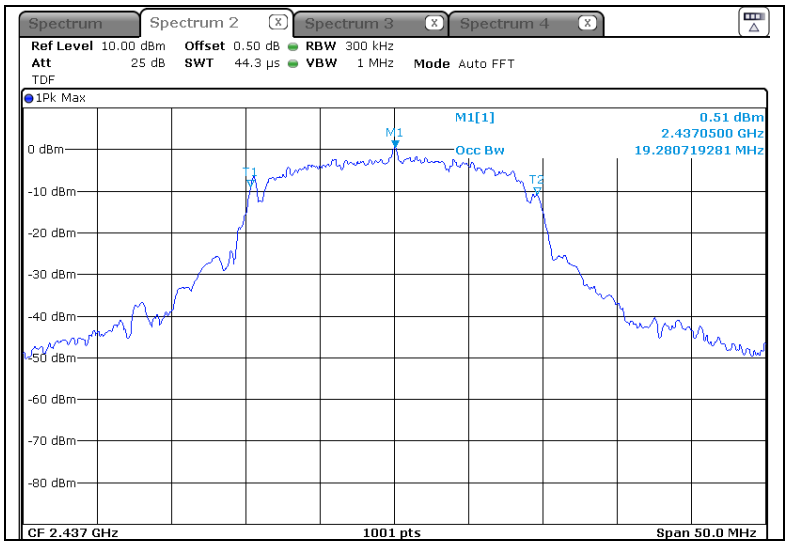


- 802.11n HT20_Occupied Bandwidth

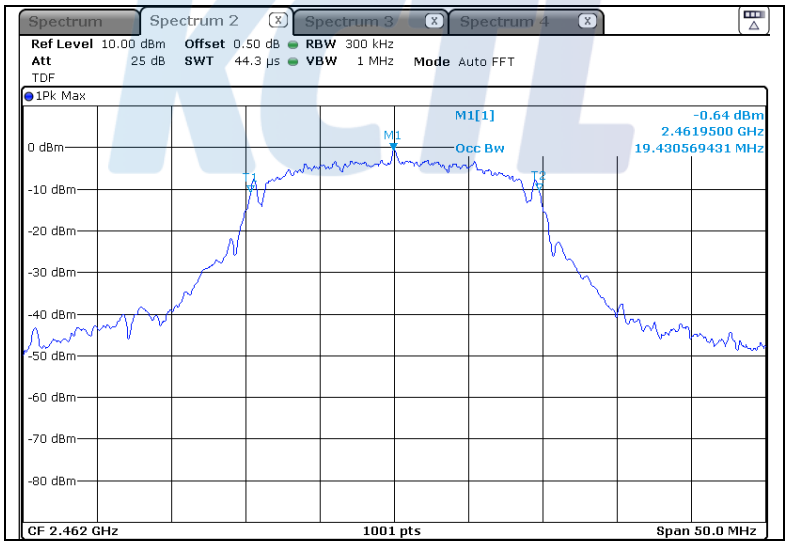
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



Highest Channel (2 462 ㎒)



5.5 Spurious Emission, Band Edge, and Restricted bands

5.5.1 Regulation

According to §15.247(d), in any 100 ㎑ 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 ㏈ below that in the 100 ㎑ bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 ㏈ instead of 20 ㏈. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

According to §15.209(a), Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall notexceed the field strength levels specified in the following table:

Frequency (㎒)	Field strength (㎛/m)	Measurement distance (m)
0.009 - 0.490	2 400/F(㎑)	300
0.490 - 1.705	24 000/F(㎑)	30
1.705 - 30	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 ㎒, 76–88 ㎒, 174–216 ㎒ or 470–806 ㎒. However, operation within these frequency bands is permltted under other sections of this part, e.g., §§15.231 and 15.241.

According to § 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.009 - 0.110 0.495 - 0.505 2.173 5 - 2.190 5 4.125 - 4.128 4.177 25 - 4.177 75 4.207 25 - 4.207 75 6.215 - 6.218 6.267 75 - 6.268 25 6.311 75 - 6.312 25 8.291 - 8.294 8.362 - 8.366 8.376 25 - 8.386 75 8.414 25 - 8.414 75 12.29 - 12.293 12.519 75 - 12.520 25 12.576 75 - 12.577 25 13.36 - 13.41	16.42 - 16.423 16.694 75 - 16.695 25 16.804 25 - 16.804 75 25.5 - 25.67 37.5 - 38.25 73 - 74.6 74.8 - 75.2 108 - 121.94 123 - 138 149.9 - 150.05 156.524 75 - 156.525 25 156.7 - 156.9 162.012 5 - 167.17 167.72 - 173.2 240 - 285 322 - 335.4	399.9 - 410 608 - 614 960 – 1 240 1 300 – 1 427 1 435 – 1 626.5 1 645.5 – 1 646.5 1 660 – 1 710 1 718.8 – 1 722.2 2 200 – 2 300 2 310 – 2 390 2 483.5 – 2 500 2 690 – 2 900 3 260 – 3 267 3 332 – 3 339 3 345.8 – 3 358 3 600 – 4 400	4.5 - 5.15 5.35 - 5.46 7.25 - 7.75 8.025 - 8.5 9.0 - 9.2 9.3 - 9.5 10.6 - 12.7 13.25 - 13.4 14.47 - 14.5 15.35 - 16.2 17.7 - 21.4 22.01 - 23.12 23.6 - 24.0 31.2 - 31.8 36.43 - 36.5 Above 38.6

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1 000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

5.5.2 Measurement Procedure

5.5.2.1 Band-edge Compliance of RF Conducted Emissions

5.5.2.1.1 Reference Level Measurement

Establish a reference level by using the following procedure:

1) Set instrument center frequency to DTS channel center frequency.
2) Set the span to ≥ 1.5 times the DTS bandwidth.
3) Set the RBW = 100 ㎑.
4) Set the VBW ≥ 3 x RBW.
5) Detector = peak.
6) Sweep time = auto couple.
7) Trace mode = max hold.
8) Allow trace to fully stabilize.
9) Use the peak marker function to determine the maximum PSD level.

5.5.2.1.2 Emissions Level Measurement

1) Set the center frequency and span to encompass frequency range to be measured.
2) Set the RBW = 100 ㎑.
3) Set the VBW ≥ 3 x RBW.
4) Detector = peak.
5) Ensure that the number of measurement points ≥ span/RBW
6) Sweep time = auto couple.
7) Trace mode = max hold.
8) Allow trace to fully stabilize.
9) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

5.5.2.2 Conducted Spurious Emissions

Set the spectrum analyzer as follows:

1) Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
   Typically, several plots are required to cover this entire span.
2) RBW = 100 ㎑
3) VBW ≥ RBW
4) Sweep = auto
5) Detector function = peak
6) Trace = max hold
7) Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
8) Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

5.5.2.3 Radiated Spurious Emissions

1) The preliminary and final rdiated measurements were performed to determine the frequency producing the maximum emissions in at a 10m anechoic chamber. The EUT was tested at a distance 3 meters.
2) The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360˚.
3) The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 ㎑ to 30 ㎒ using the loop antenna, and from 30 to 1 000 ㎒ using the TRILOG broadband antenna, and from 1 000 ㎒ to 26 500 ㎒ using the horn antenna.
4) Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
5) The 0.8m height is for below 1 G testing, and 1.5m is for above 1G testing.

Note

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 ㎑ for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 ㎓.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 ㎒ for Peak detection and frequency above 1 ㎓.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 ㎒ and the video bandwidth is 3 ㎒ for Average detection (AV) at frequency above 1 ㎓. (Detector = RMS, Averaging type = power)
   In case of duty cycle less than 98%, a duty cycle correction factor has to be added to the measurement result.

5.5.3 Test Result

- Complied

1. Band edge & Conducted Spurious Emissions was shown in figure 3 & 4.
   Note: We took the insertion loss of the cable into consideration within the measuring instrument.
2. Measured value of the Field strength of spurious Emissions (Radiated)
3. It tested x,y and z – 3 axis each, mentioned only worst case data at this report.

※ Noise was not measured. (Margin was more than 20 ㏈)

- Below 1 ㎓ data (worst-case: 802.11g)

Lowest channel (2 412 ㎒)_DC 5 V

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [㏈(㎶)]	Cable Loss [㏈]	Amp Gain [㏈]	Antenna Factor [㏈]	Factor [㏈]	Result [㏈(㎶/m)]	Limit [㏈(㎶/m)]	Margin [㏈]
Quasi-Peak DATA. Emissions below 30 ㎒										
16.21	9	V	38.64	1.02	-32.67	19.45	-12.20	26.44	69.50	43.06
21.91	9	V	39.10	1.22	-32.68	19.26	-12.20	26.90	69.50	42.60
Quasi-Peak DATA. Emissions below 1 ㎓										
47.46	120	V	38.74	1.41	-30.36	15.22	-13.73	25.01	40.00	14.99
62.13	120	V	45.81	1.68	-25.41	8.18	-15.55	30.26	40.00	9.74
239.76	120	H	32.57	3.43	-34.67	17.61	-13.63	18.94	46.00	27.06
286.32	120	V	36.26	3.78	-35.15	18.93	-12.44	23.82	46.00	22.18
400.90	120	V	37.54	4.63	-35.19	21.22	-9.34	28.20	46.00	17.80
905.55	120	V	30.91	8.36	-39.75	31.31	-0.08	30.83	46.00	15.17

Lowest channel (2 412 ㎒)_DC 12 V

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [㏈(㎶)]	Cable Loss [㏈]	Amp Gain [㏈]	Antenna Factor [㏈]	Factor [㏈]	Result [㏈(㎶/m)]	Limit [㏈(㎶/m)]	Margin [㏈]
Quasi-Peak DATA. Emissions below 30 ㎒										
2.88	9	V	38.20	0.36	-32.71	19.65	-12.70	25.50	69.50	44.00
14.14	9	V	36.10	0.94	-32.67	19.53	-12.20	23.90	69.50	45.60
Quasi-Peak DATA. Emissions below 1 ㎓										
61.28	120	V	44.37	1.62	-29.24	12.33	-15.29	29.08	40.00	10.92
82.50	120	V	48.15	1.94	-34.50	12.75	-19.82	28.33	40.00	11.67
182.65	120	V	49.28	3.42	-34.92	14.75	-16.76	32.52	43.50	10.98
286.32	120	V	35.95	3.78	-35.15	18.93	-12.44	23.51	46.00	22.49
316.76	120	H	37.32	4.01	-35.25	19.54	-11.70	25.62	46.00	20.38
400.90	120	V	38.11	4.63	-35.19	21.22	-9.34	28.77	46.00	17.23

NOTE 1. Factor = Cable loss + Amplifier gain + Antenna factor
NOTE 2. Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

- Above 1 ㎓ data

DC 5 V

802.11b_Lowest channel (2 412 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 827.11	1 000	V	68.13	3.26	-63.12	27.11	-	-32.75	35.38	74.00	38.62
3 294.77	1 000	V	67.99	4.33	-62.02	30.50	-	-27.19	40.80	74.00	33.20
2 389.92[1)]	1 000	H	50.67	3.70	-29.33	28.54	-	2.91	53.58	74.00	20.42
4 824.03[1) 2)]	1 000	H	69.83	5.35	-60.76	32.81	-	-22.60	47.23	74.00	26.77
7 236.02[1) 2)]	1 000	H	72.33	6.72	-59.53	35.94	-	-16.87	55.46	74.00	18.54
21 680.50	1 000	V	47.96	12.00	-49.46	45.00	-	7.54	55.50	74.00	18.50
25 825.58	1 000	V	43.80	13.50	-46.70	45.60	-	12.40	56.21	74.00	17.79
Average DATA. Emissions above 1 ㎓											
2 389.92[1)]	1 000	H	42.67	3.70	-29.33	28.54	-	2.91	45.58	54.00	8.42
4 824.03[1) 2)]	1 000	H	67.68	5.35	-60.76	32.81	-	-22.60	45.08	54.00	8.92
7 236.02[1) 2)]	1 000	H	69.28	6.72	-59.53	35.94	-	-16.87	52.41	54.00	1.59

[1)] Restricted band
[2)] Harmonic

802.11b_Middle channel (2 437 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 892.19	1 000	V	66.71	3.32	-62.97	27.37	-	-32.28	34.43	74.00	39.57
3 294.45	1 000	V	66.99	4.33	-62.03	30.50	-	-27.20	39.80	74.00	34.20
4 874.09[1) 2)]	1 000	V	67.54	5.39	-60.78	32.84	-	-22.55	44.99	74.00	29.01
7 309.95[1) 2)]	1 000	H	71.90	6.75	-59.68	36.01	-	-16.92	54.98	74.00	19.02
21 512.36	1 000	V	48.23	11.90	-49.38	45.00	-	7.52	55.75	74.00	18.25
25 711.09	1 000	H	45.46	13.40	-46.86	45.60	-	12.14	57.60	74.00	16.40
Average DATA. Emissions above 1 ㎓											
4 874.09[1) 2)]	1 000	V	63.62	5.39	-60.78	32.84	-	-22.55	41.07	54.00	12.93
7 309.95[1) 2)]	1 000	H	68.20	6.75	-59.68	36.01	-	-16.92	51.28	54.00	2.72

[1)] Restricted band
[2)] Harmonic

802.11b_Highest channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 299.61	1 000	H	67.29	2.75	-64.01	25.00	-	-36.26	31.03	74.00	42.97
2 484.14	1 000	H	52.89	3.77	-29.28	28.72	-	3.21	56.09	74.00	17.91
2 946.80	1 000	H	67.52	4.10	-62.18	29.60	-	-28.48	39.03	74.00	34.97
4 923.94[1) 2)]	1 000	V	68.88	5.42	-60.74	32.86	-	-22.46	46.42	74.00	27.58
7 384.70[1) 2)]	1 000	H	72.93	6.79	-59.85	36.08	-	-16.98	55.95	74.00	18.05
21 827.92	1 000	H	47.14	12.10	-49.53	45.00	-	7.57	54.70	74.00	19.30
26 195.86	1 000	V	45.75	13.70	-46.64	45.60	-	12.66	58.41	74.00	15.59
Average DATA. Emissions above 1 GHz											
2 484.14	1 000	H	44.16	3.77	-29.28	28.72	-	3.21	47.37	54.00	6.63
4 923.94	1 000	V	67.33	5.42	-60.74	32.86	-	-22.46	44.87	54.00	9.13
7 384.70	1 000	H	69.57	6.79	-59.85	36.08	-	-16.98	52.59	54.00	1.41

1) Restricted band
2) Harmonic

802.11g_Lowest channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 893.75	1 000	V	66.39	3.32	-62.97	27.38	-	-32.27	34.13	74.00	39.87
2 389.82	1 000	H	68.43	3.70	-29.33	28.54	-	2.91	71.34	74.00	2.66
3 215.63	1 000	V	67.07	4.28	-62.04	30.28	-	-27.48	39.59	74.00	34.41
4 825.19[1) 2)]	1 000	H	68.24	5.35	-60.76	32.81	-	-22.60	45.64	74.00	28.36
7 234.59[1) 2)]	1 000	H	72.34	6.72	-59.52	35.93	-	-16.87	55.47	74.00	18.53
21 681.83	1 000	V	44.96	12.00	-49.46	45.00	-	7.54	52.50	74.00	21.50
26 209.94	1 000	V	43.37	13.70	-46.65	45.60	-	12.65	56.02	74.00	17.98
Average DATA. Emissions above 1 GHz											
2 484.14[1)]	1 000	H	49.55	3.70	-29.33	28.54	0.18	2.91	52.46	54.00	1.36
4 825.19[1) 2)]	1 000	H	58.13	5.35	-60.76	32.81	0.18	-22.60	35.53	54.00	18.29
7 234.59[1) 2)]	1 000	H	62.05	6.72	-59.52	35.93	0.18	-16.87	45.18	54.00	8.64

1) Restricted band
2) Harmonic

802.11g_Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 266.48	1 000	V	67.17	2.72	-63.98	24.87	-	-36.39	30.78	74.00	43.22
1 768.28	1 000	V	65.69	3.20	-63.18	26.87	-	-33.11	32.59	74.00	41.41
4 874.20[1)2)]	1 000	H	66.02	5.39	-60.78	32.84	-	-22.55	43.47	74.00	30.53
7 311.20[1)2)]	1 000	H	70.48	6.75	-59.68	36.01	-	-16.92	53.55	74.00	20.45
21 440.91	1 000	H	47.09	11.90	-49.30	44.90	-	7.50	54.59	74.00	19.41
25 187.81	1 000	V	46.19	13.00	-47.38	45.30	-	10.92	57.10	74.00	16.90
Average DATA. Emissions above 1 GHz											
4 874.20[1)2)]	1 000	H	56.98	5.39	-60.78	32.84	0.18	-22.55	34.43	54.00	19.39
7 311.20[1)2)]	1 000	H	60.51	6.75	-59.68	36.01	0.18	-16.92	43.59	54.00	10.23

1) Restricted band
2) Harmonic

802.11g_Highest channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 244.22	1 000	V	68.56	2.70	-63.95	24.78	-	-36.47	32.09	74.00	41.91
1 725.08	1 000	V	66.95	3.16	-63.18	26.70	-	-33.32	33.63	74.00	40.37
2 483.51[1)]	1 000	H	60.55	3.77	-29.28	28.72	-	3.21	63.76	74.00	10.24
4 843.98[1)2)]	1 000	H	65.15	5.36	-60.76	32.82	-	-22.58	42.57	74.00	31.43
7 385.50[1)2)]	1 000	H	66.73	6.79	-59.86	36.09	-	-16.98	49.75	74.00	24.25
21 445.95	1 000	V	48.99	11.90	-49.29	44.90	-	7.51	56.50	74.00	17.50
25 807.25	1 000	V	45.48	13.50	-46.74	45.60	-	12.36	57.84	74.00	16.16
Average DATA. Emissions above 1 GHz											
2 483.51[1)]	1 000	H	48.03	3.77	-29.28	28.72	0.18	3.21	51.24	54.00	2.58
4 843.98[1)2)]	1 000	H	54.39	5.36	-60.76	32.82	0.18	-22.58	31.81	54.00	22.01
7 385.50[1)2)]	1 000	H	56.89	6.79	-59.86	36.09	0.18	-16.98	39.91	54.00	13.91

1) Restricted band
2) Harmonic

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802.11n HT20_Lowest channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 789.77	1 000	V	68.83	3.22	-63.18	26.96	-	-33.00	35.82	74.00	38.18
2 389.03[1)]	1 000	H	60.34	3.70	-29.33	28.54	-	2.91	63.26	74.00	10.74
3 456.25	1 000	H	68.53	4.43	-61.69	30.93	-	-26.33	42.20	74.00	31.80
7 238.77[1)2)]	1 000	H	69.43	6.72	-59.52	35.94	-	-16.86	52.57	74.00	21.43
16 255.92[1)2)]	1 000	V	58.58	10.20	-56.10	38.22	-	-7.68	50.90	74.00	23.10
21 545.30	1 000	H	47.39	12.00	-49.48	45.00	-	7.52	54.91	74.00	19.09
26 044.98	1 000	V	44.78	13.70	-46.62	45.70	-	12.78	57.56	74.00	16.44
Average DATA. Emissions above 1 GHz-											
2 389.03[1)]	1 000	H	48.65	3.70	-29.33	28.54	0.19	2.91	51.56	54.00	2.25
7 238.77[1)2)]	1 000	H	57.70	6.72	-59.52	35.94	0.19	-16.86	40.84	54.00	12.97

[1)] Restricted band
[2)] Harmonic

802.11n HT20_Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 821.80	1 000	H	70.37	3.26	-63.14	27.09	-	-32.79	37.57	74.00	36.43
3 425.31	1 000	V	68.66	4.41	-61.72	30.85	-	-26.46	42.19	74.00	31.81
7 313.50[1)2)]	1 000	H	69.12	6.76	-59.70	36.01	-	-16.93	52.19	74.00	21.81
17 596.72	1 000	V	59.99	10.70	-56.74	43.88	-	-2.16	57.83	74.00	16.17
21 427.09	1 000	V	47.89	11.90	-49.30	44.90	-	7.50	55.39	74.00	18.61
26 347.27	1 000	H	45.37	13.70	-46.76	45.60	-	12.54	57.92	74.00	16.08
Average DATA. Emissions above 1 GHz											
7 313.50[1)2)]	1 000	H	53.28	6.76	-59.70	36.01	0.19	-16.93	36.35	54.00	17.46

[1)] Restricted band
[2)] Harmonic

802.11n HT20_Highest channel (2 462 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 921.25	1 000	V	67.83	3.35	-62.93	27.49	-	-32.09	35.74	74.00	38.26
2 483.54[1)]	1 000	H	68.35	3.77	-29.28	28.72	-	3.21	71.56	74.00	2.44
3 370.47	1 000	H	73.46	4.38	-61.83	30.70	-	-26.75	46.71	74.00	27.29
7 392.80[1) 2)]	1 000	H	67.28	6.79	-59.86	36.09	-	-16.98	50.30	74.00	23.70
9 501.19	1 000	V	64.05	7.76	-58.69	37.80	-	-13.13	50.93	74.00	23.07
21 278.88	1 000	V	47.98	11.90	-49.32	44.90	-	7.48	55.46	74.00	18.54
25 929.44	1 000	H	45.39	13.60	-46.65	45.70	-	12.65	58.04	74.00	15.96
Average DATA. Emissions above 1 ㎓											
2 483.54[1)]	1 000	H	47.36	3.77	-29.28	28.72	0.19	3.21	50.57	54.00	3.24
7 392.80[1) 2)]	1 000	H	53.25	6.79	-59.86	36.09	0.19	-16.98	36.27	54.00	17.54

[1)] Restricted band
[2)] Harmonic

- Above 1 ㎓ data

DC 12 V

802.11b_Lowest channel (2 412 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 252.81	1 000	V	65.95	2.71	-63.92	24.81	-	-36.40	29.55	74.00	44.45
1 974.06	1 000	V	68.06	3.40	-62.90	27.70	-	-31.80	36.26	74.00	37.74
2 389.90[1)]	1 000	H	49.23	3.70	-29.33	28.54	-	2.91	52.14	74.00	21.86
4 824.04[1) 2)]	1 000	H	70.75	5.35	-60.76	32.81	-	-22.60	48.16	74.00	25.84
7 237.05[1) 2)]	1 000	H	72.39	6.72	-59.53	35.94	-	-16.87	55.52	74.00	18.48
21 954.89	1 000	V	46.93	12.10	-49.61	45.10	-	7.59	54.52	74.00	19.48
25 913.50	1 000	V	45.53	13.60	-46.69	45.70	-	12.61	58.14	74.00	15.86
Average DATA. Emissions above 1 ㎓											
2 389.90[1)]	1 000	H	41.98	3.70	-29.33	28.54	-	2.91	44.89	54.00	9.11
4 824.04[1) 2)]	1 000	H	67.72	5.35	-60.76	32.81	-	-22.60	45.12	54.00	8.88
7 237.05[1) 2)]	1 000	H	69.19	6.72	-59.53	35.94	-	-16.87	52.32	54.00	1.68

[1)] Restricted band
[2)] Harmonic

802.11b_Middle channel (2 437 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 289.77	1 000	V	66.95	2.74	-64.00	24.96	-	-36.30	30.65	74.00	43.35
3 223.52	1 000	V	65.94	4.28	-62.03	30.30	-	-27.45	38.49	74.00	35.51
4 874.04[1) 2)]	1 000	H	68.82	5.39	-60.78	32.84	-	-22.55	46.27	74.00	27.73
7 309.95[1) 2)]	1 000	H	71.95	6.75	-59.69	36.01	-	-16.93	55.02	74.00	18.98
21 939.48	1 000	V	46.83	12.10	-49.52	45.00	-	7.58	54.41	74.00	19.59
25 857.19	1 000	H	45.42	13.50	-46.62	45.60	-	12.48	57.90	74.00	16.10
Average DATA. Emissions above 1 ㎓											
4 874.04[1) 2)]	1 000	H	62.63	5.39	-60.78	32.84	-	-22.55	40.08	54.00	13.92
7 309.95[1) 2)]	1 000	H	68.63	6.75	-59.69	36.01	-	-16.93	51.70	54.00	2.30

[1)] Restricted band
[2)] Harmonic

802.11b_Highest channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 271.41	1 000	V	67.12	2.73	-63.99	24.89	-	-36.37	30.75	74.00	43.25
2 483.59[1)]	1 000	H	52.89	3.77	-29.28	28.72	-	3.21	56.09	74.00	17.91
3 282.89	1 000	V	66.43	4.32	-62.02	30.46	-	-27.24	39.19	74.00	34.81
4 923.94[1) 2)]	1 000	H	69.06	5.42	-60.74	32.86	-	-22.46	46.60	74.00	27.40
7 387.37[1) 2)]	1 000	H	71.51	6.79	-59.86	36.09	-	-16.98	54.53	74.00	19.47
21 536.00	1 000	H	47.63	12.00	-49.48	45.00	-	7.52	55.15	74.00	18.85
25 921.20	1 000	V	45.74	13.60	-46.67	45.70	-	12.63	58.37	74.00	15.63
Average DATA. Emissions above 1 GHz											
2 483.59[1)]	1 000	H	44.32	3.77	-29.28	28.72	-	3.21	47.53	54.00	6.47
4 923.94[1) 2)]	1 000	H	64.08	5.42	-60.74	32.86	-	-22.46	41.62	54.00	12.38
7 387.37[1) 2)]	1 000	H	68.21	6.79	-59.86	36.09	-	-16.98	51.23	54.00	2.77

[1)] Restricted band
[2)] Harmonic

802.11g_Lowest channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 286.80	1 000	V	67.06	2.74	-64.00	24.95	-	-36.31	30.74	74.00	43.26
2 389.82[1)]	1 000	H	68.43	3.70	-29.33	28.54	-	2.91	71.34	74.00	2.66
3 215.94	1 000	H	67.49	4.28	-62.04	30.28	-	-27.48	40.01	74.00	33.99
4 824.99[1) 2)]	1 000	H	66.79	5.35	-60.76	32.81	-	-22.60	44.19	74.00	29.81
7 236.59[1) 2)]	1 000	H	70.32	6.72	-59.53	35.94	-	-16.87	53.45	74.00	20.55
21 500.41	1 000	V	45.83	11.90	-49.39	45.00	-	7.51	53.35	74.00	20.65
26 252.97	1 000	V	45.77	13.70	-46.68	45.60	-	12.62	58.39	74.00	15.61
Average DATA. Emissions above 1 GHz											
2 389.82[1)]	1 000	H	48.80	3.70	-29.33	28.54	0.18	2.91	51.71	54.00	2.11
4 824.99[1) 2)]	1 000	H	58.23	5.35	-60.76	32.81	0.18	-22.60	35.63	54.00	18.19
7 236.59[1) 2)]	1 000	H	62.15	6.72	-59.53	35.94	0.18	-16.87	45.28	54.00	8.54

[1)] Restricted band
[2)] Harmonic

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802.11g_Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 650.39	1 000	V	66.70	3.09	-63.29	26.40		-33.80	32.90	74.00	41.10
3 238.05	1 000	V	67.49	4.29	-62.03	30.34		-27.40	40.09	74.00	33.91
4 873.00[1) 2)]	1 000	H	66.35	5.38	-60.78	32.84		-22.56	43.80	74.00	30.20
7 310.60[1) 2)]	1 000	H	70.73	6.75	-59.68	36.01		-16.92	53.81	74.00	20.19
21 487.92	1 000	V	47.76	11.90	-49.39	45.00		7.51	55.27	74.00	18.73
25 864.09	1 000	V	45.59	13.50	-46.61	45.60		12.49	58.08	74.00	15.92
4 873.00[1) 2)]	1 000	H	56.91	5.38	-60.78	32.84	0.18	-22.56	34.35	54.00	19.47
7 310.60[1) 2)]	1 000	H	60.34	6.75	-59.68	36.01	0.18	-16.92	43.42	54.00	10.40

[1)] Restricted band
[2)] Harmonic

802.11g_Highest channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
1 428.28	1 000	V	67.29	2.88	-63.55	25.51	-	-35.16	32.14	74.00	41.86
1 657.97	1 000	V	66.90	3.10	-63.28	26.43	-	-33.75	33.16	74.00	40.84
2 483.52[1)]	1 000	H	56.62	3.77	-29.28	28.72	-	3.21	59.83	74.00	14.17
4 844.80[1) 2)]	1 000	H	65.95	5.37	-61.42	32.82	-	-23.23	42.72	74.00	31.28
7 386.50[1) 2)]	1 000	H	69.10	6.79	-59.85	36.09	-	-16.97	52.13	74.00	21.87
21 880.52	1 000	V	47.02	12.10	-49.53	45.00	-	7.57	54.59	74.00	19.41
26 218.44	1 000	H	44.37	13.70	-46.66	45.60	-	12.64	57.01	74.00	16.99
Average DATA. Emissions above 1 GHz											
2 483.52[1)]	1 000	H	48.07	3.77	-29.28	28.72	0.18	3.21	51.28	54.00	2.54
4 844.80[1) 2)]	1 000	H	53.53	5.37	-61.42	32.82	0.18	-23.23	30.30	54.00	23.52
7 386.50[1) 2)]	1 000	H	56.82	6.79	-59.85	36.09	0.18	-16.97	39.85	54.00	13.97

[1)] Restricted band
[2)] Harmonic

802.11n HT20_Lowest channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
2 097.03	1 000	V	68.67	3.50	-62.66	27.98	-	-31.18	37.50	74.00	36.50
2 389.02[1)]	1 000	H	61.96	3.70	-29.33	28.54	-	2.91	64.87	74.00	9.13
3 465.00	1 000	H	69.21	4.44	-61.69	30.96	-	-26.29	42.92	74.00	31.08
7 236.40[1) 2)]	1 000	H	68.27	6.72	-59.53	35.94	-	-16.87	51.40	74.00	22.60
14 310.66	1 000	V	60.68	9.64	-55.59	40.78	-	-5.17	55.51	74.00	18.49
21 966.58	1 000	V	47.30	12.10	-49.61	45.10	-	7.59	54.89	74.00	19.11
25 932.09	1 000	V	44.26	13.60	-46.65	45.70	-	12.65	56.92	74.00	17.08
Average DATA. Emissions above 1 GHz-											
2 389.02[1)]	1 000	H	47.86	3.70	-29.33	28.54	0.19	2.91	50.77	54.00	3.04
7 236.40[1) 2)]	1 000	H	57.28	6.72	-59.53	35.94	0.19	-16.87	40.41	54.00	13.40

[1)] Restricted band
[2)] Harmonic

802.11n HT20_Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 GHz											
2 002.66	1 000	V	68.56	3.43	-62.81	27.81	-	-31.57	36.99	74.00	37.01
2 648.44	1 000	H	74.19	3.89	-62.82	29.03	-	-29.90	44.29	74.00	29.71
7 316.70[1) 2)]	1 000	H	68.87	6.76	-59.71	36.02	-	-16.93	51.95	74.00	22.05
15 144.86	1 000	H	60.83	9.81	-56.13	39.89	-	-6.43	54.40	74.00	19.60
21 738.67	1 000	V	47.49	12.00	-49.45	45.00	-	7.55	55.05	74.00	18.95
26 124.67	1 000	V	44.91	13.70	-46.69	45.70	-	12.71	57.62	74.00	16.38
Average DATA. Emissions above 1 GHz											
7 316.70[1) 2)]	1 000	H	53.18	6.76	-59.71	36.02	0.19	-16.93	36.25	54.00	17.56

[1)] Restricted band
[2)] Harmonic

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802.11n HT20_Highest channel (2 462 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(μV)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	DCCF [dB]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓											
1 956.48	1 000	V	72.42	3.38	-62.87	27.63	-	-31.86	40.56	74.00	33.44
2 483.76[1)]	1 000	H	67.66	3.77	-29.28	28.72	-	3.21	70.87	74.00	3.13
3 225.78	1 000	V	68.12	4.28	-62.03	30.31	-	-27.44	40.67	74.00	33.33
7 387.36[1) 2)]	1 000	H	67.83	6.79	-59.86	36.09	-	-16.98	50.85	74.00	23.15
14 452.94[1) 2)]	1 000	H	59.60	9.66	-55.03	40.68	-	-4.69	54.91	74.00	19.09
21 607.98	1 000	V	48.21	12.00	-49.47	45.00	-	7.53	55.74	74.00	18.26
25 929.44	1 000	H	45.39	13.60	-46.65	45.70	-	12.65	58.04	74.00	15.96
Average DATA. Emissions above 1 ㎓											
2 483.76[1)]	1 000	H	48.41	3.77	-29.28	28.72	0.19	3.21	51.62	54.00	2.19
7 387.36[1) 2)]	1 000	H	53.02	6.79	-59.86	36.09	0.19	-16.98	36.04	54.00	17.77

[1)] Restricted band
[2)] Harmonic

5.7.4 Test Plot

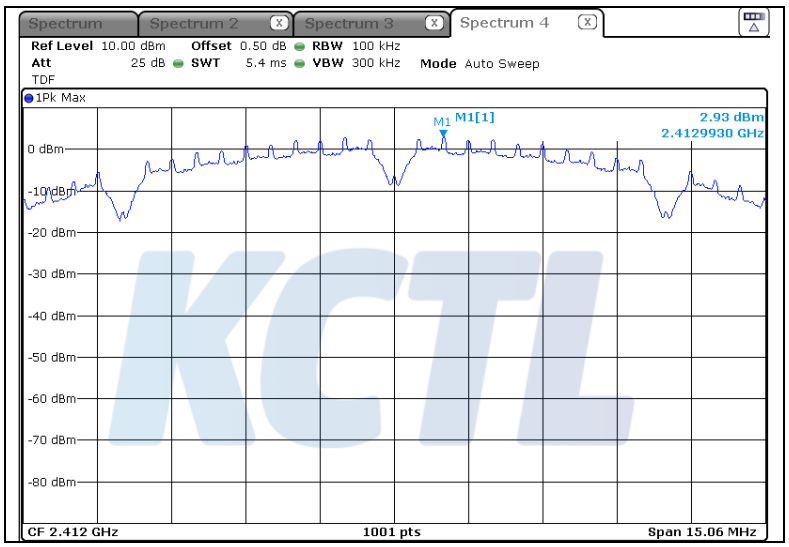
Figure 3. Plot of the Band-edge & Conducted Spurious Emissions

- DC 5 V

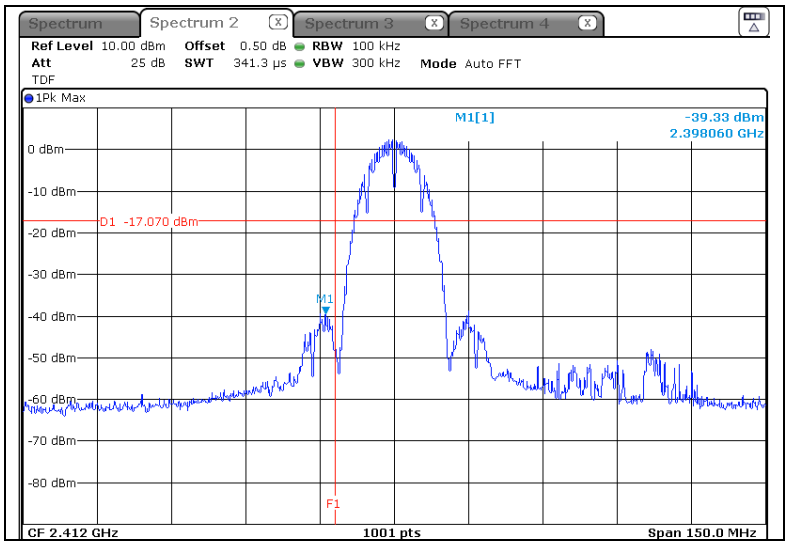
- 802.11b

Lowest Channel (2 412 ㎒)

Reference

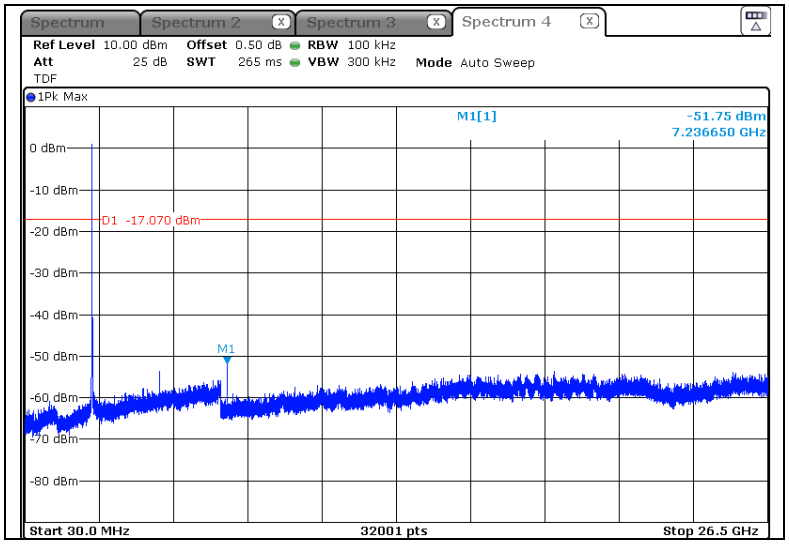


Band-edge



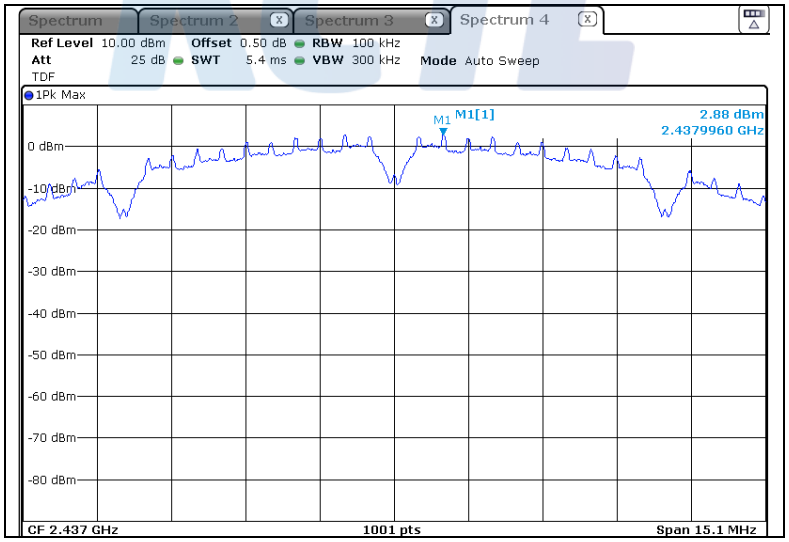
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

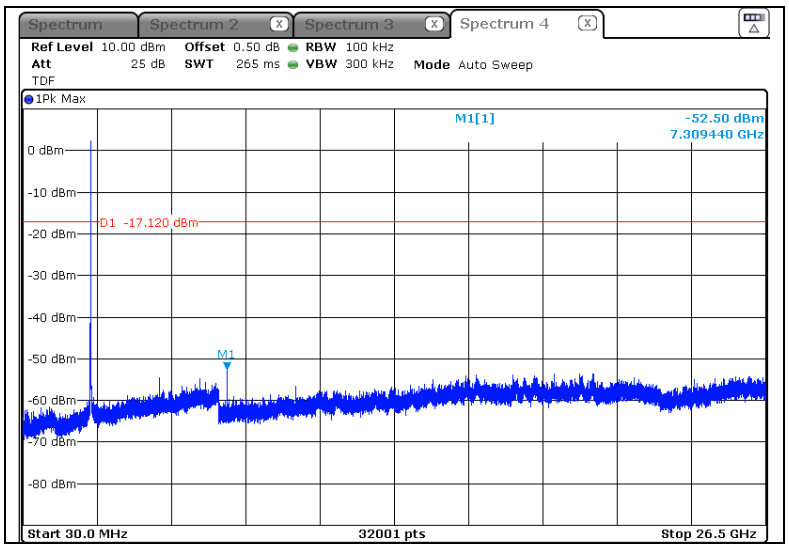


Middle Channel (2 437 ㎒)

Reference

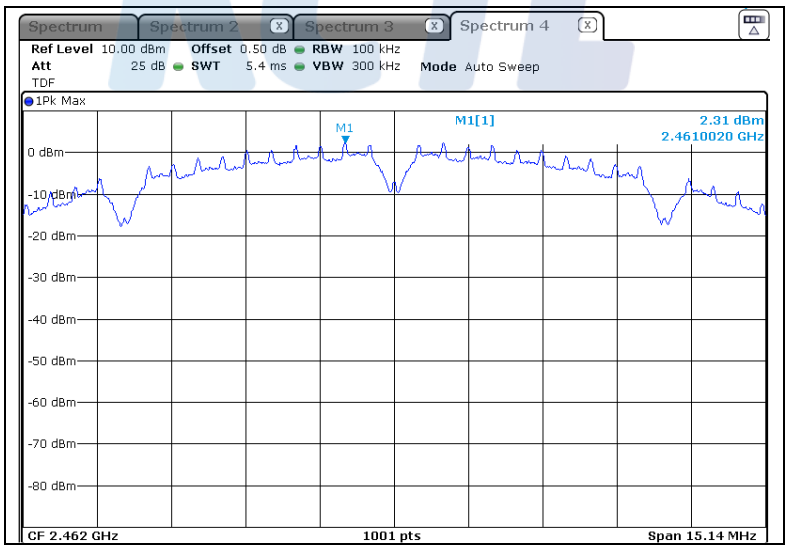


Conducted Spurious Emissions

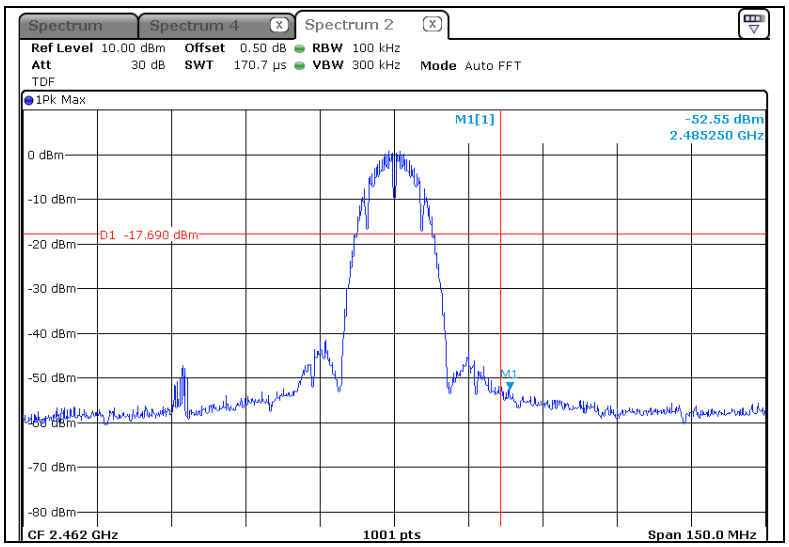


Highest Channel (2 462 ㎒)

Reference

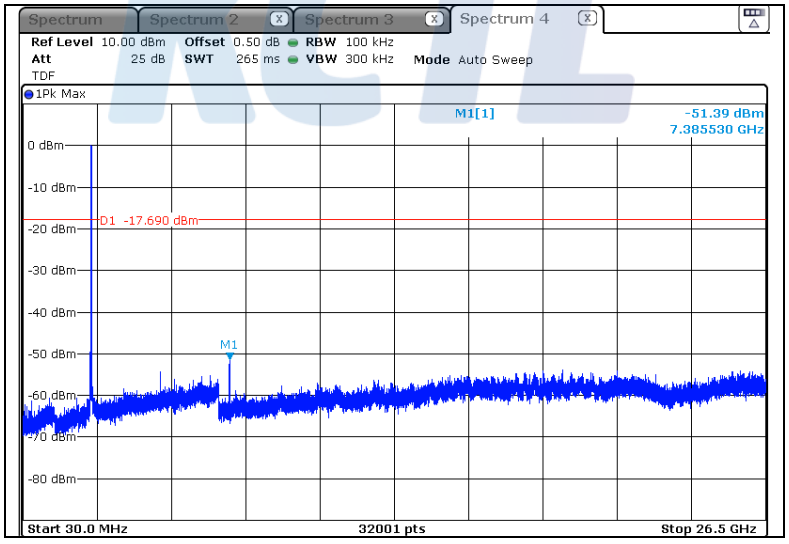


Band-edge



- Result of 2 483.5 ㎒

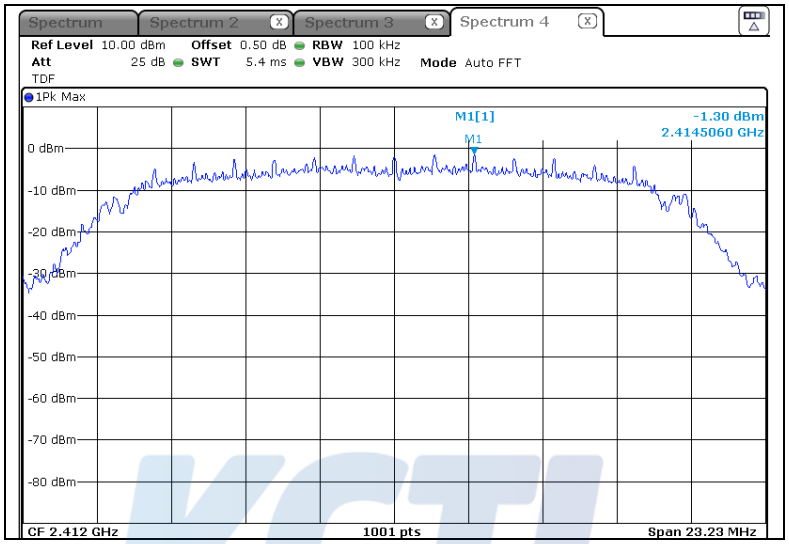
Conducted Spurious Emissions



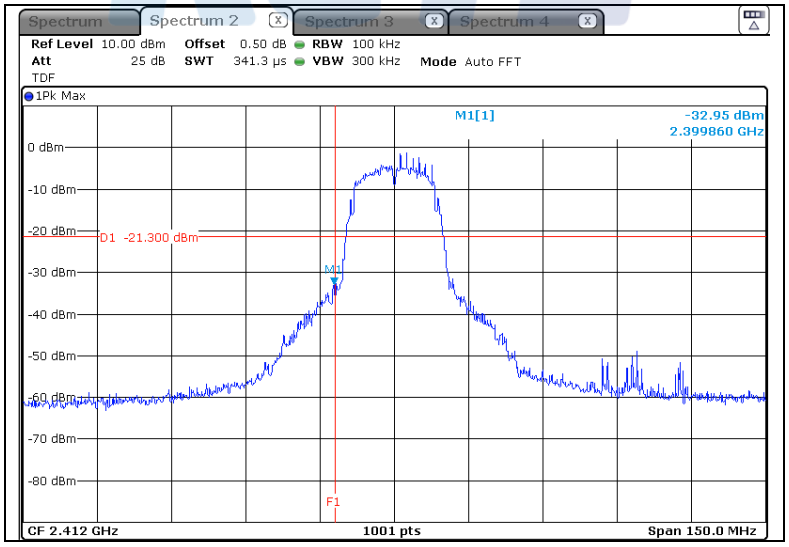
- 802.11g

Lowest Channel (2 412 ㎒)

Reference

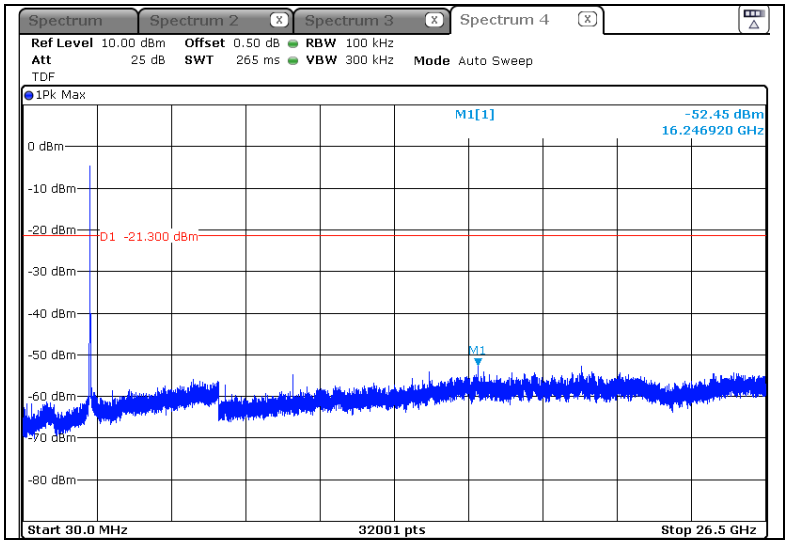


Band-edge



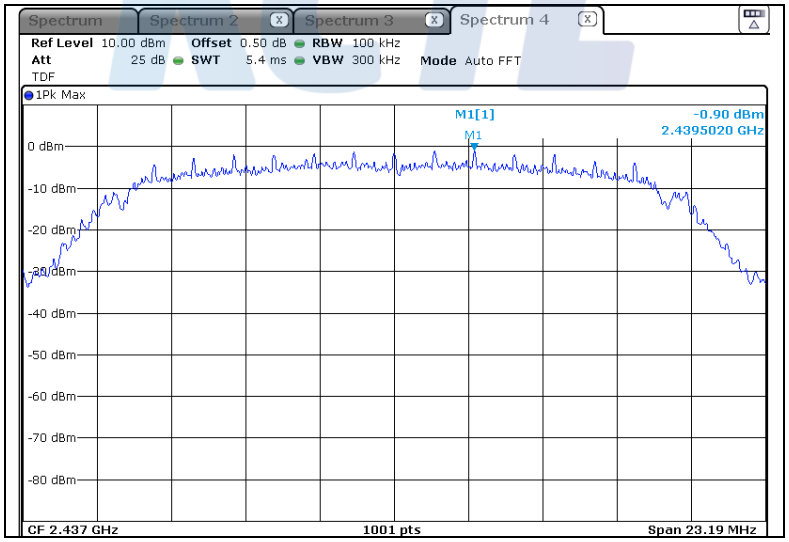
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

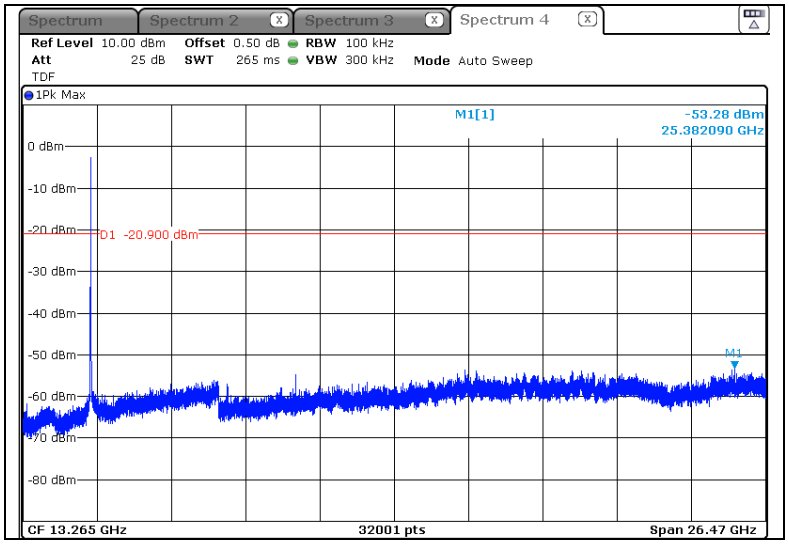


Middle Channel (2 437 ㎒)

Reference

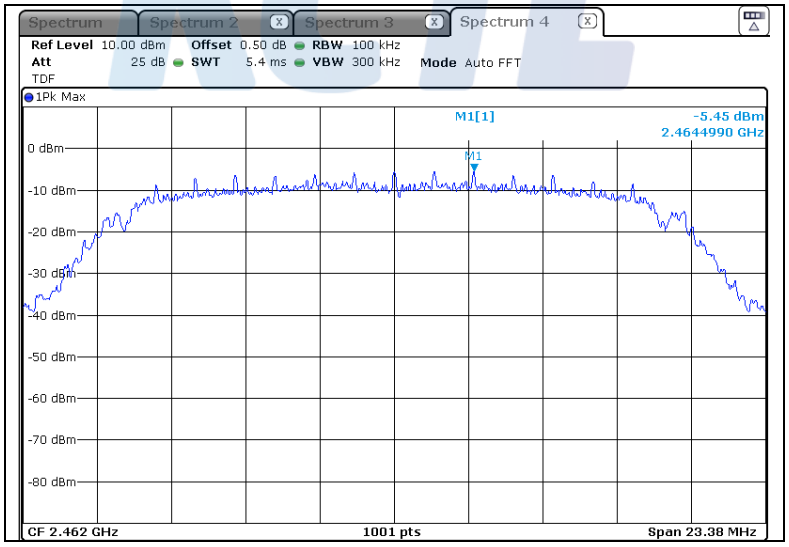


Conducted Spurious Emissions

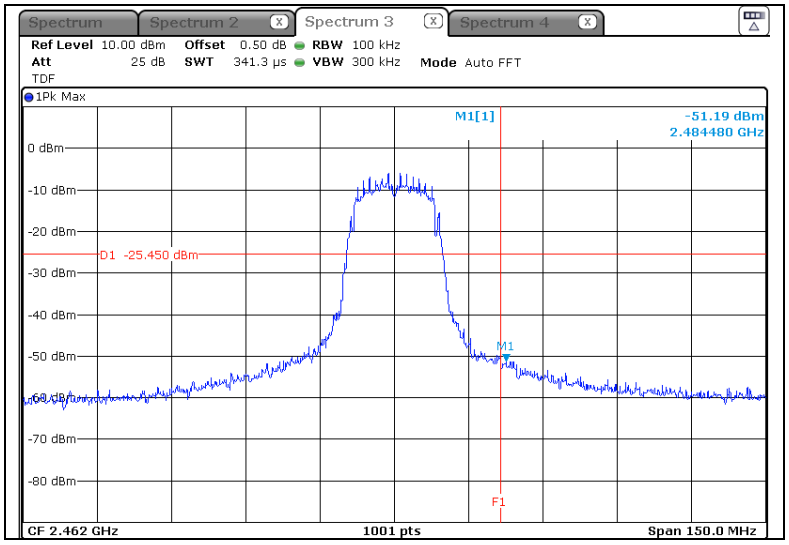


Highest Channel (2 462 ㎒)

Reference

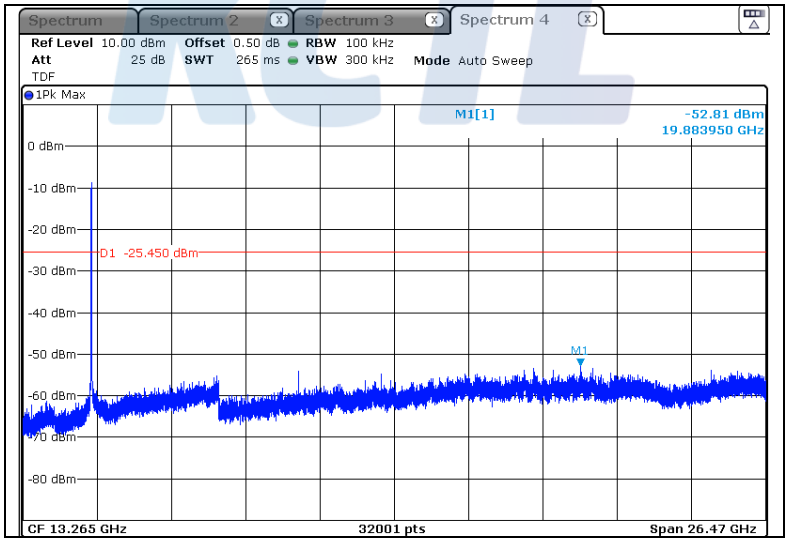


Band-edge



- Result of 2 483.5 ㎒

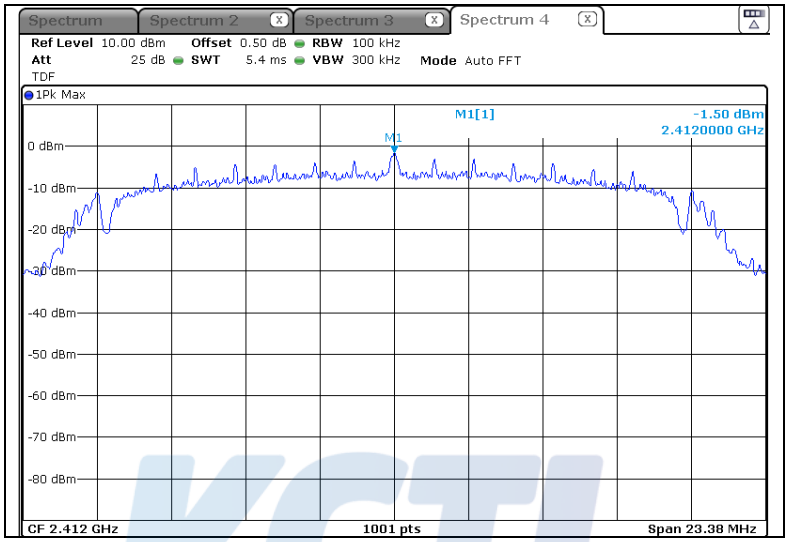
Conducted Spurious Emissions



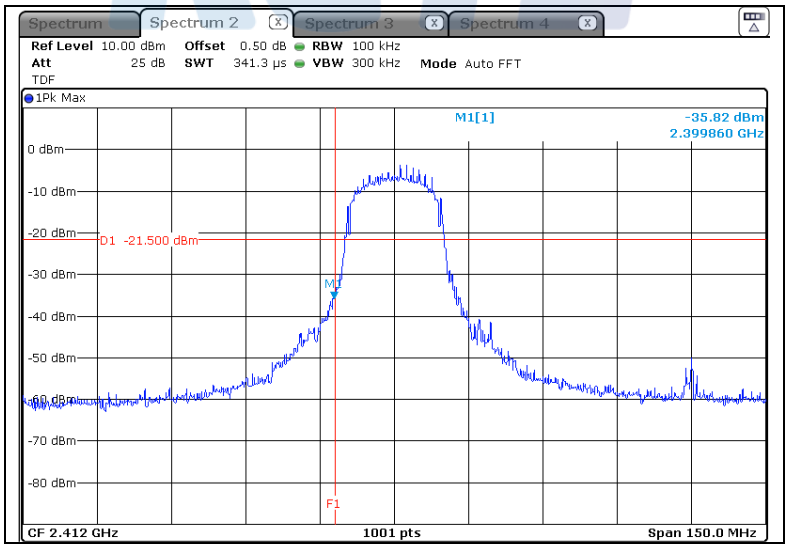
- 802.11n HT20

Lowest Channel (2 412 ㎒)

Reference

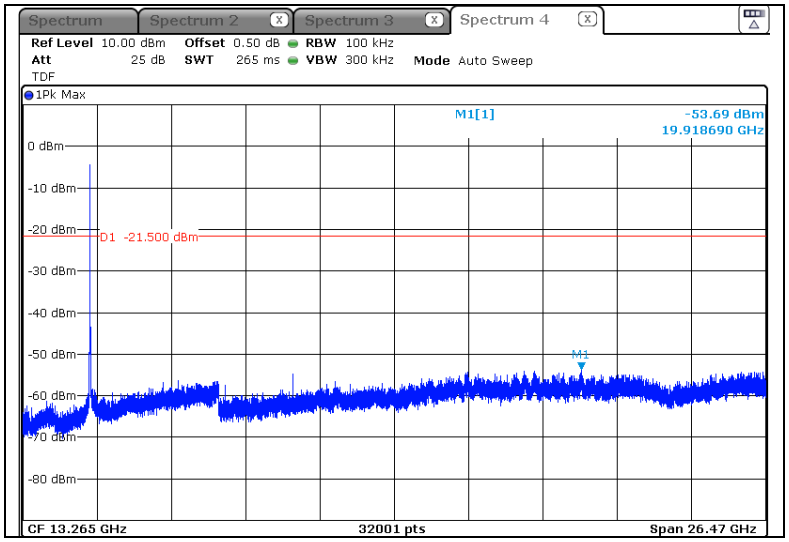


Band-edge



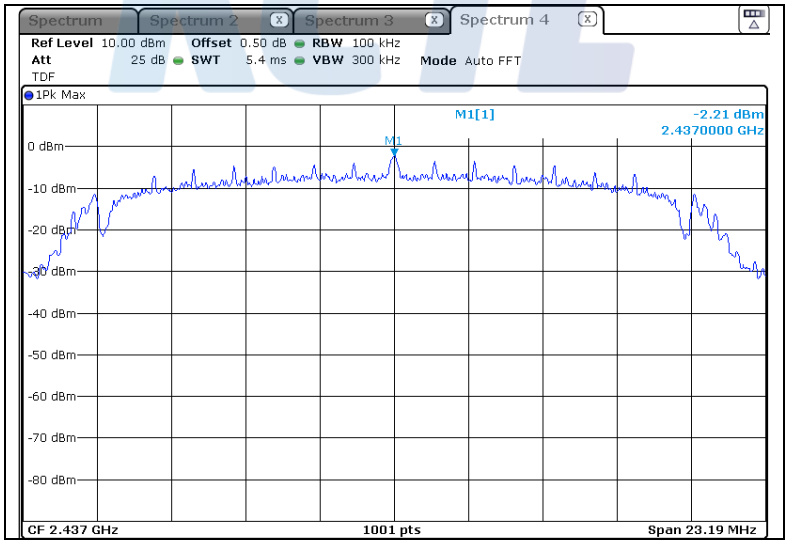
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

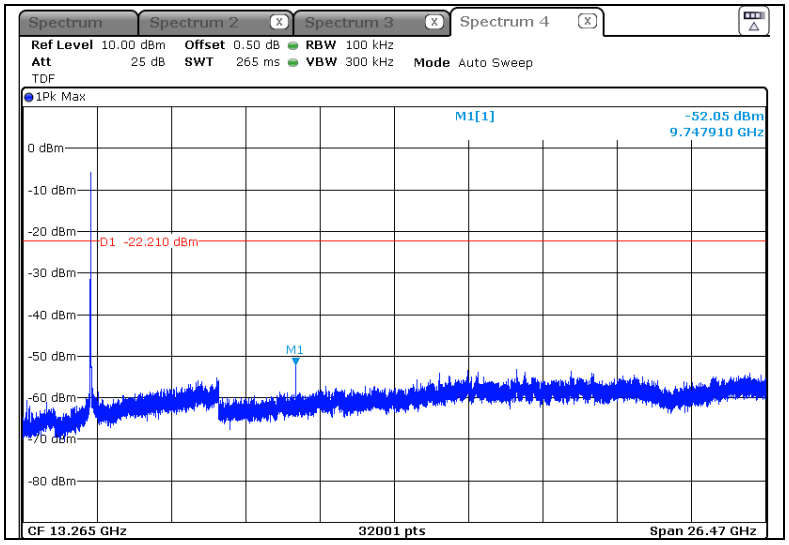


Middle Channel (2 437 ㎒)

Reference

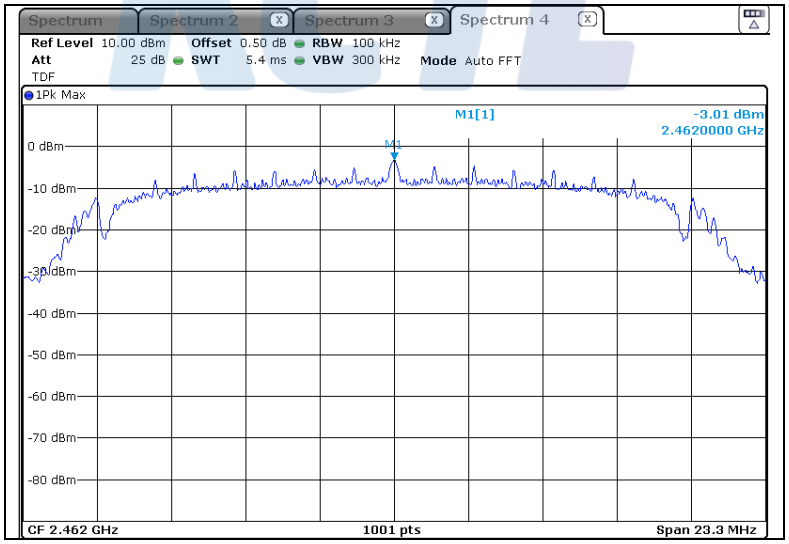


Conducted Spurious Emissions

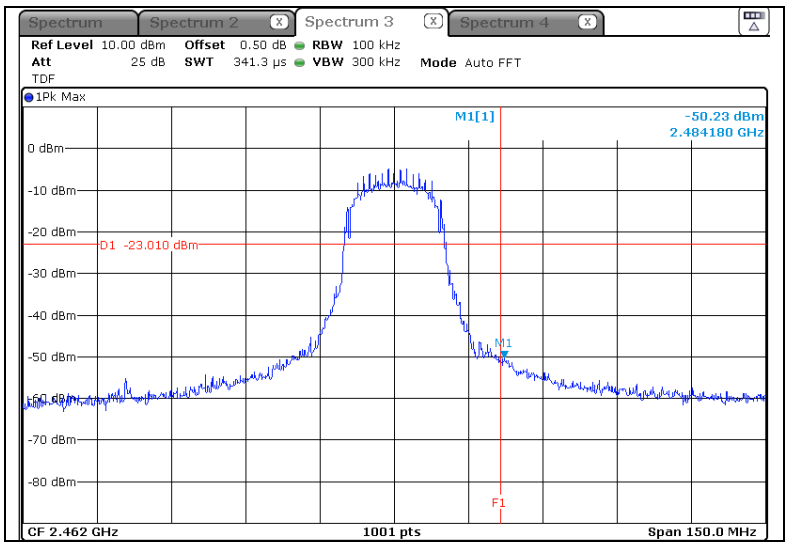


Highest Channel (2 462 ㎒)

Reference

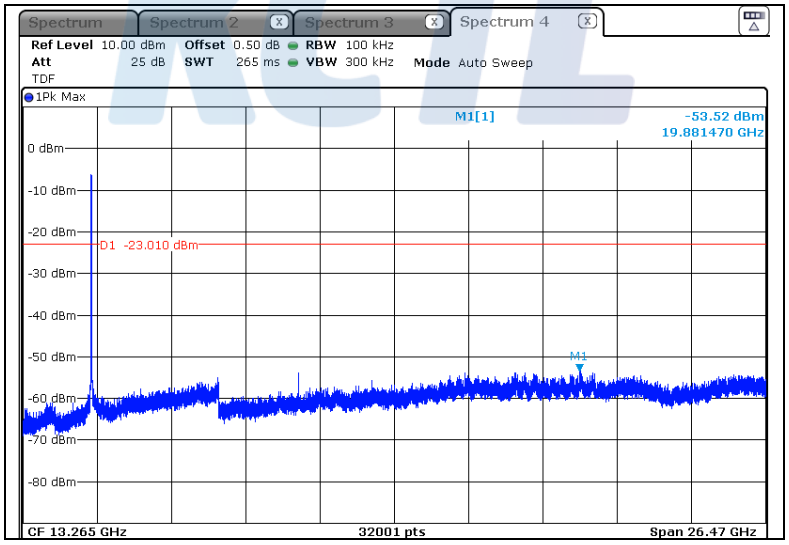


Band-edge



- Result of 2 483.5 ㎒

Conducted Spurious Emissions

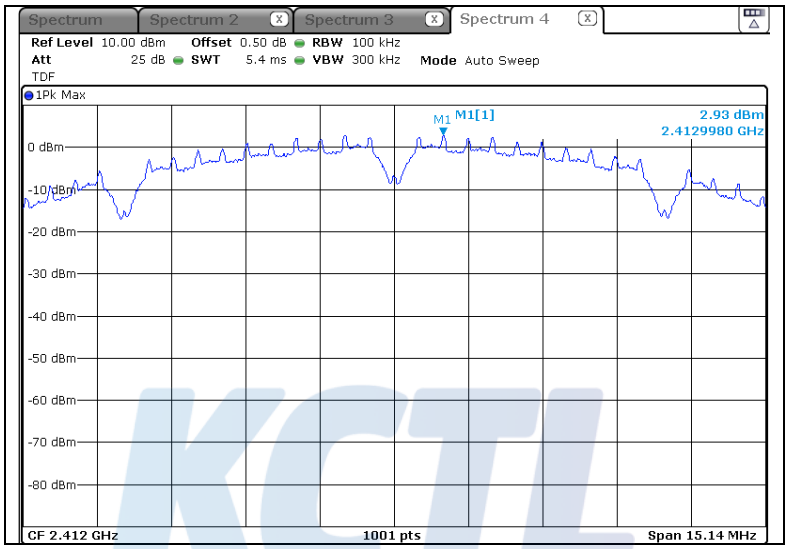


- DC 12 V

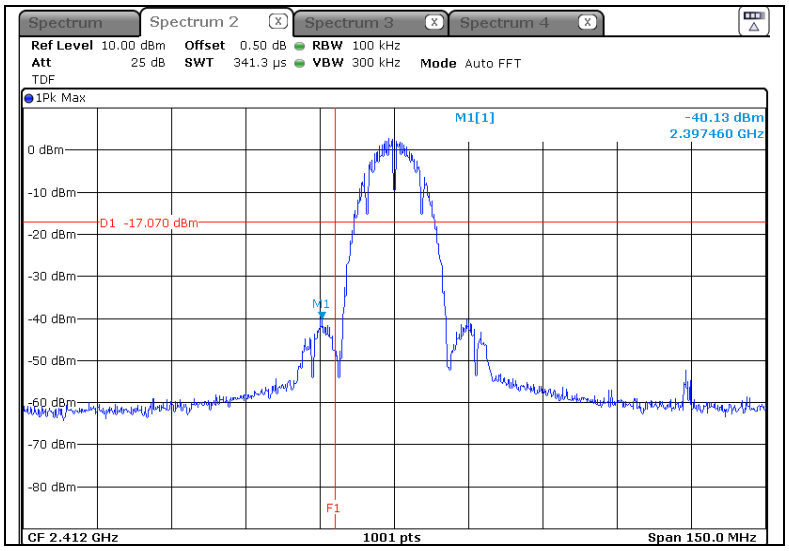
- 802.11b

Lowest Channel (2 412 ㎒)

Reference

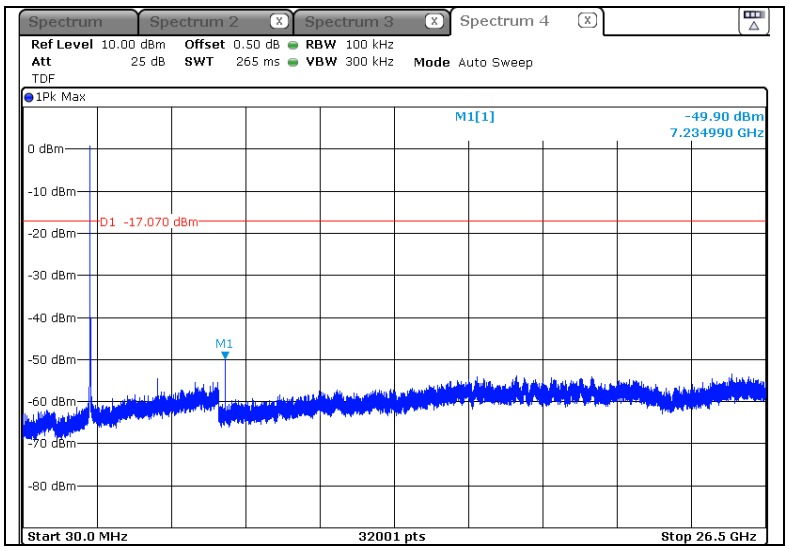


Band-edge



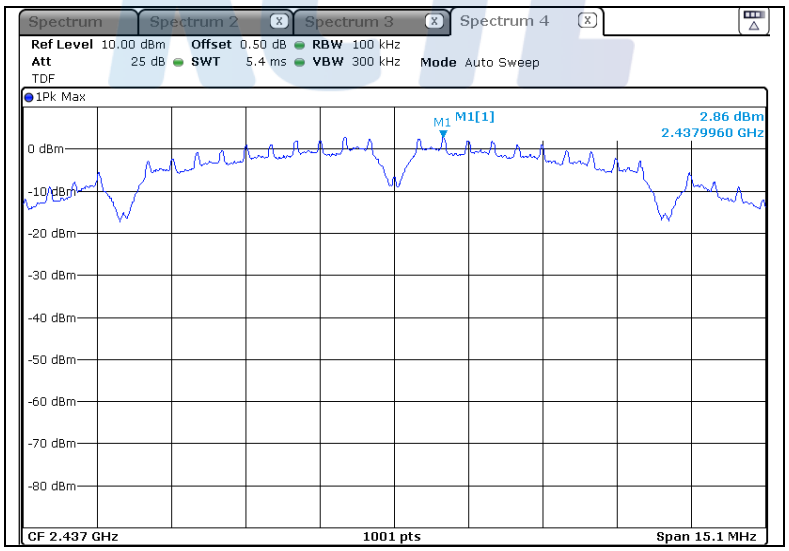
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

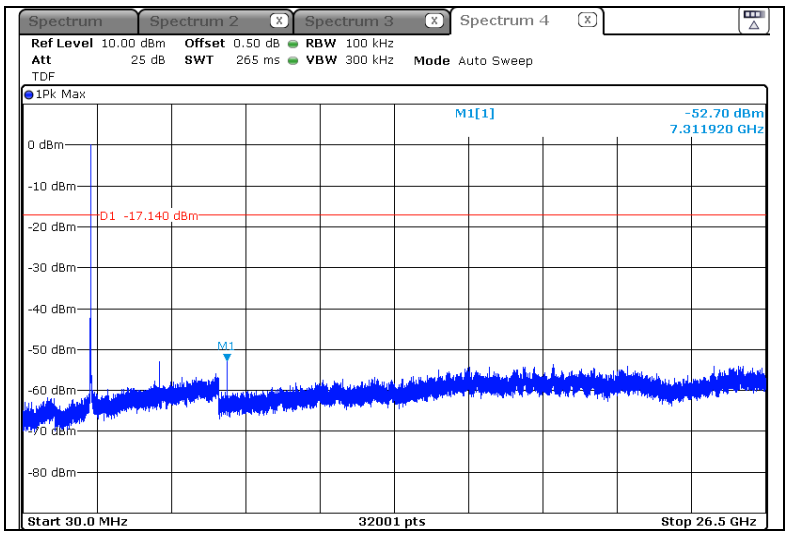


Middle Channel (2 437 ㎒)

Reference

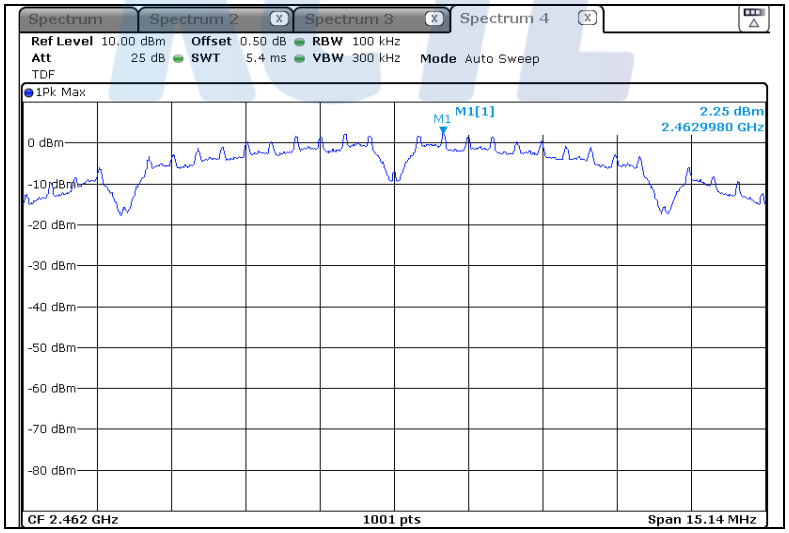


Conducted Spurious Emissions



Highest Channel (2 462 ㎒)

Reference



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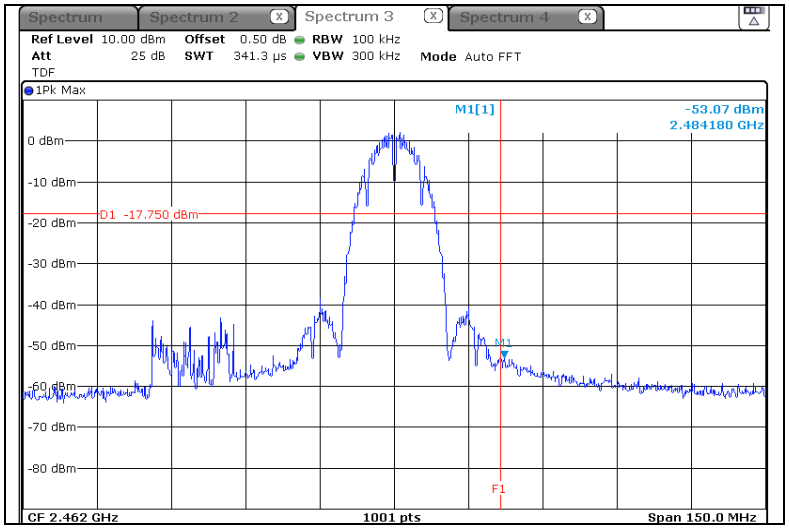
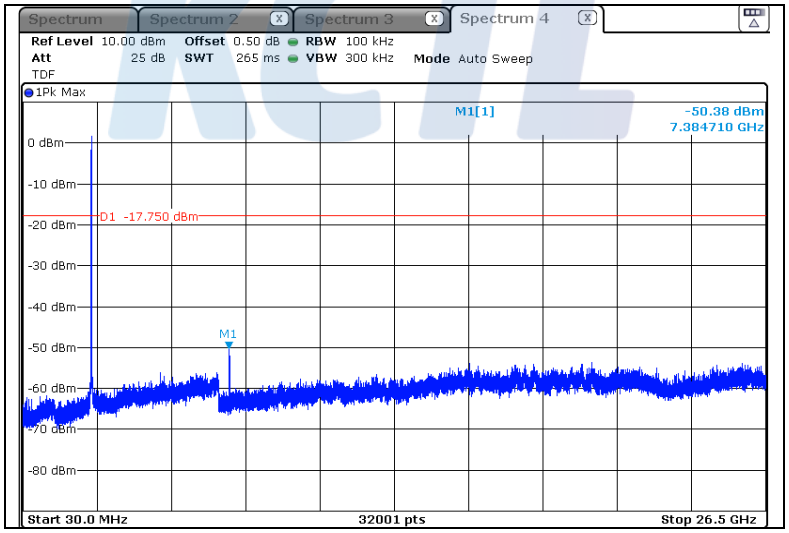


- Result of 2 483.5 ㎒

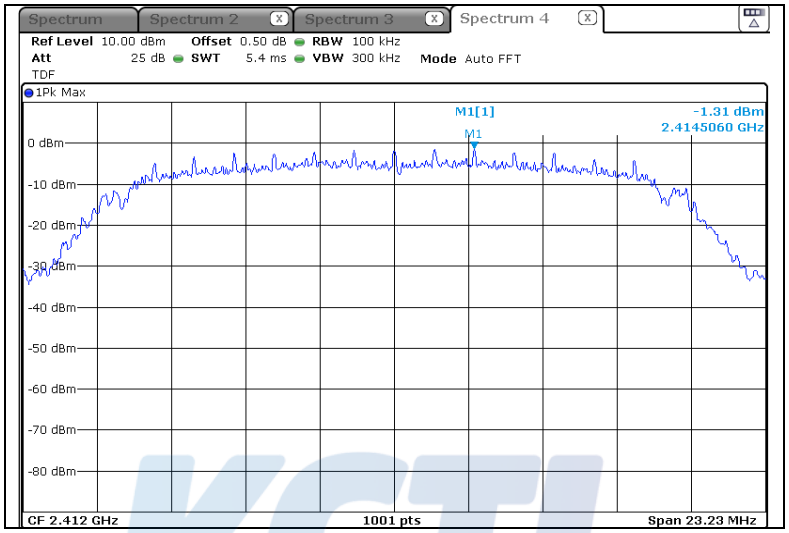
Conducted Spurious Emissions



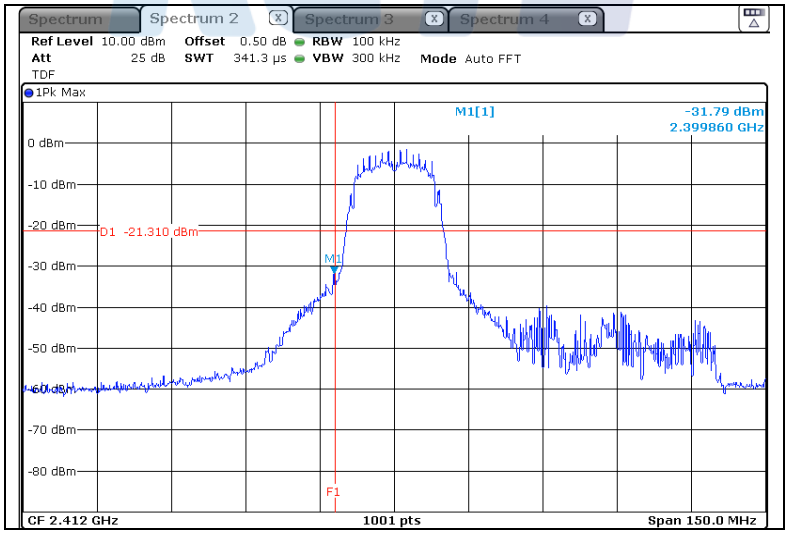
- 802.11g

Lowest Channel (2 412 ㎒)

Reference

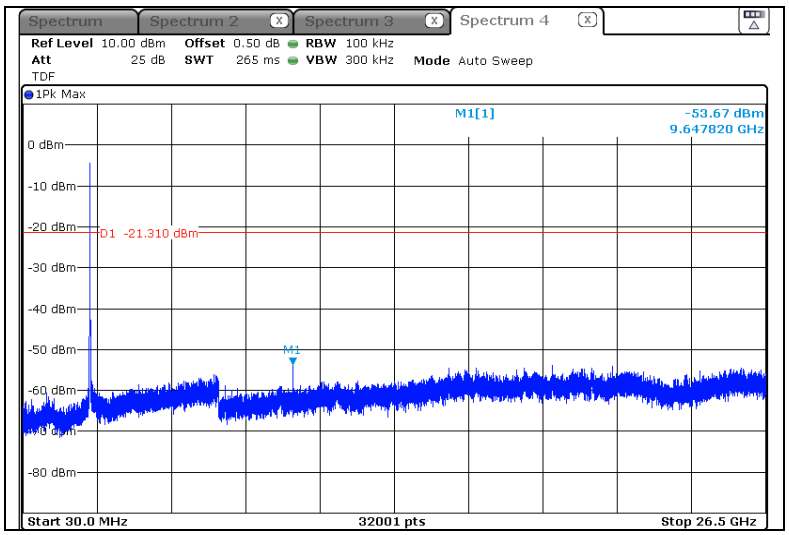


Band-edge



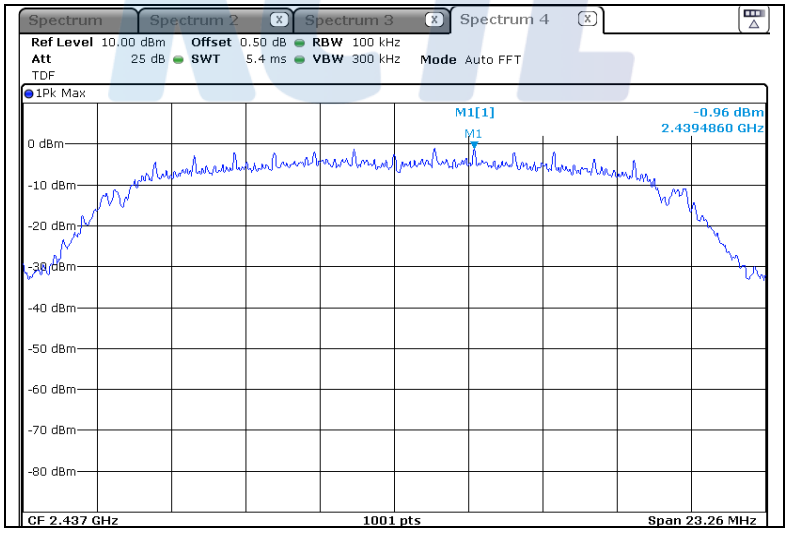
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

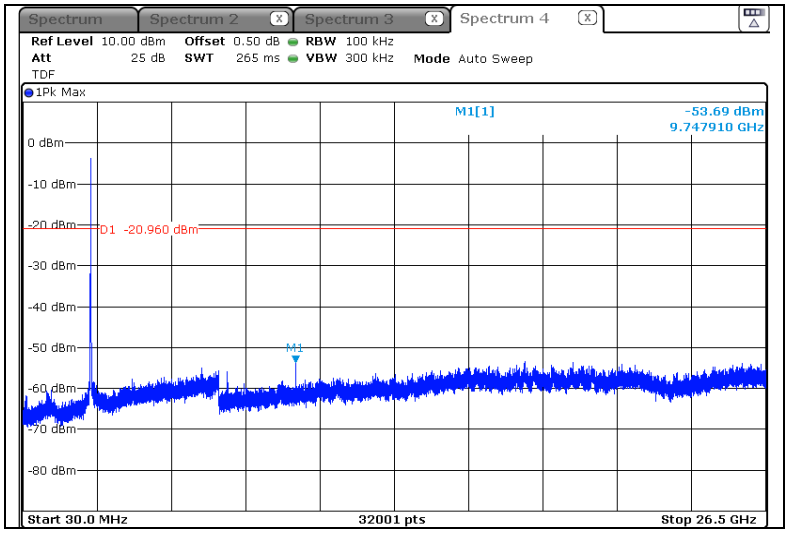


Middle Channel (2 437 ㎒)

Reference

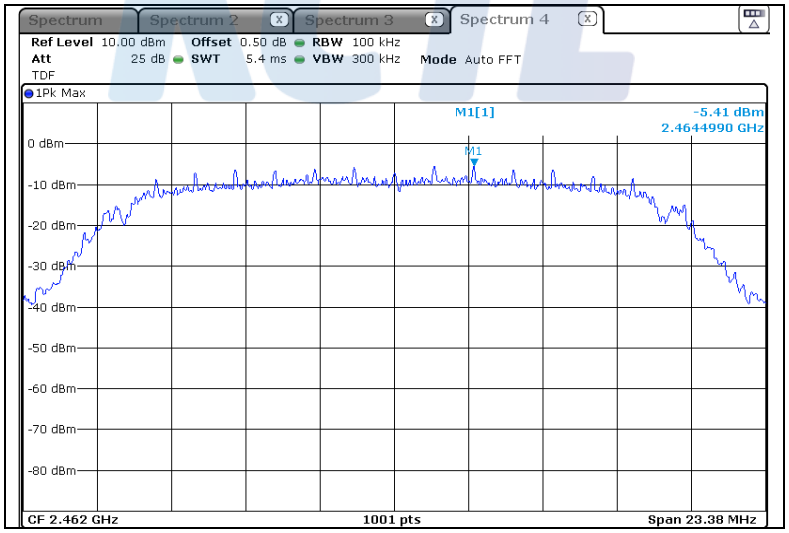


Conducted Spurious Emissions

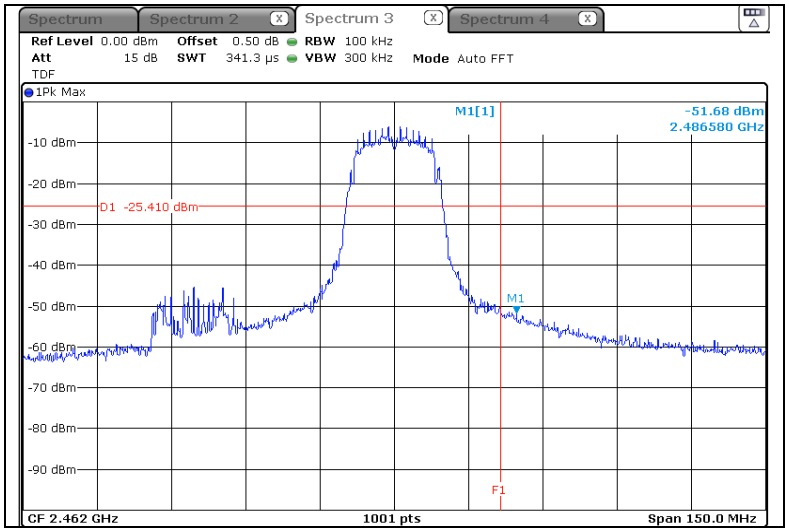


Highest Channel (2 462 ㎒)

Reference

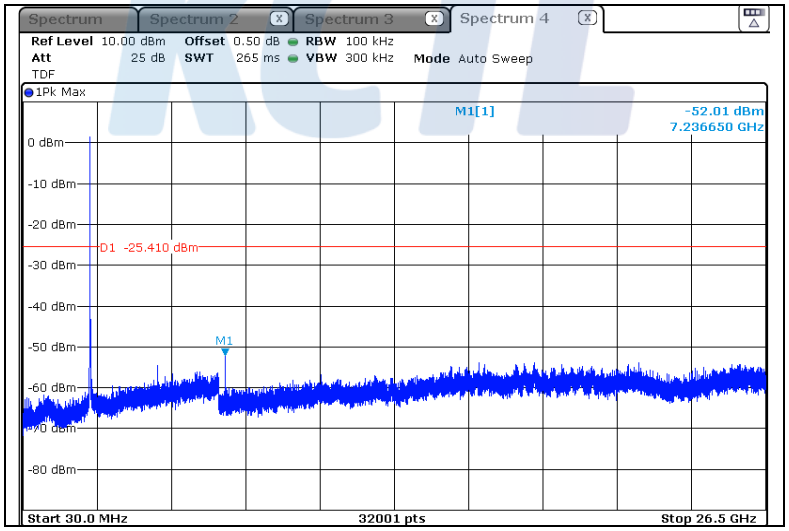


Band-edge



- Result of 2 483.5 ㎒

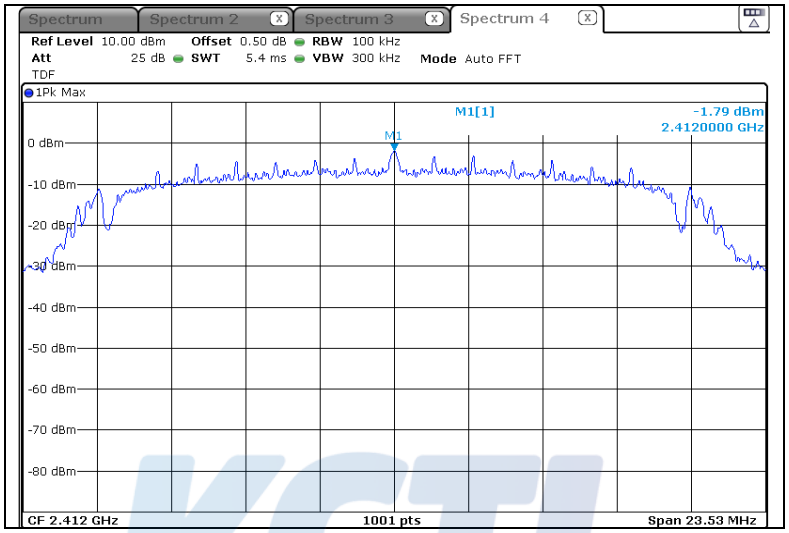
Conducted Spurious Emissions



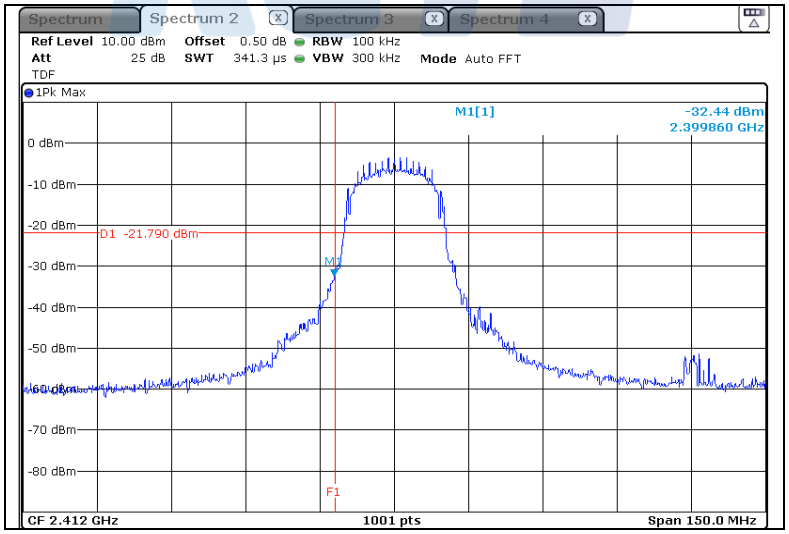
- 802.11n HT20

Lowest Channel (2 412 ㎒)

Reference

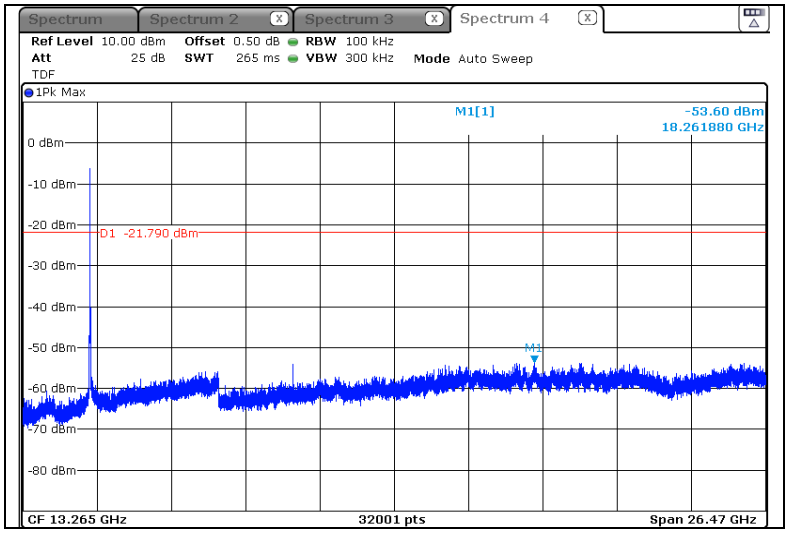


Band-edge



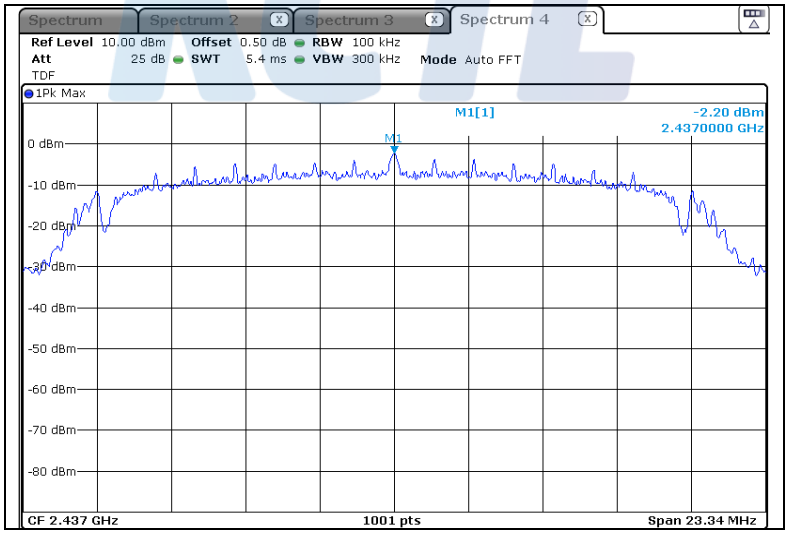
- Result of 2 400.0 ㎒

Conducted Spurious Emissions

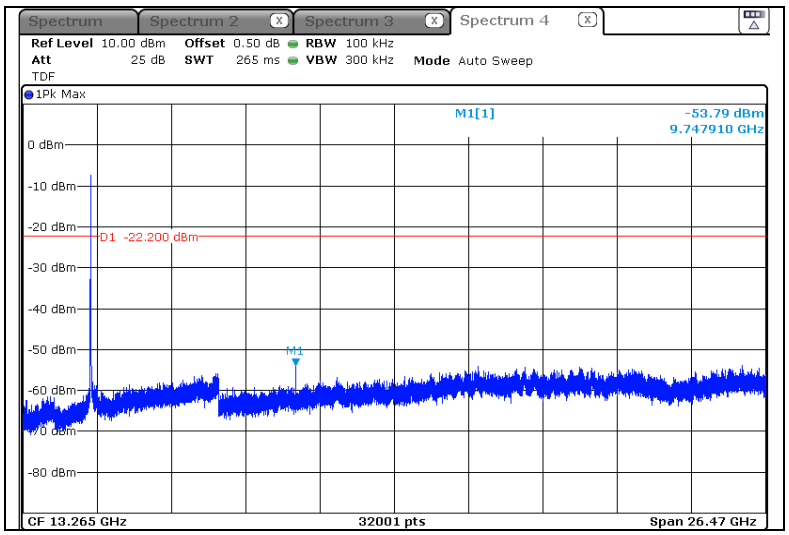


Middle Channel (2 437 ㎒)

Reference

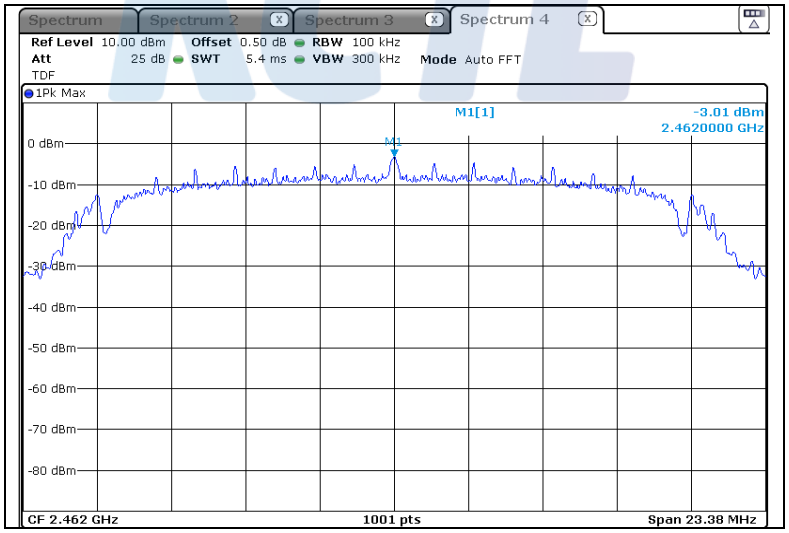


Conducted Spurious Emissions

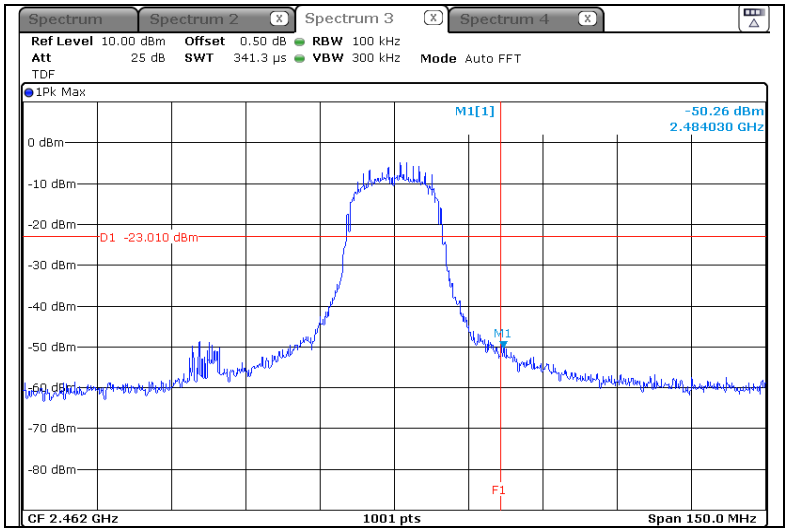


Highest Channel (2 462 ㎒)

Reference

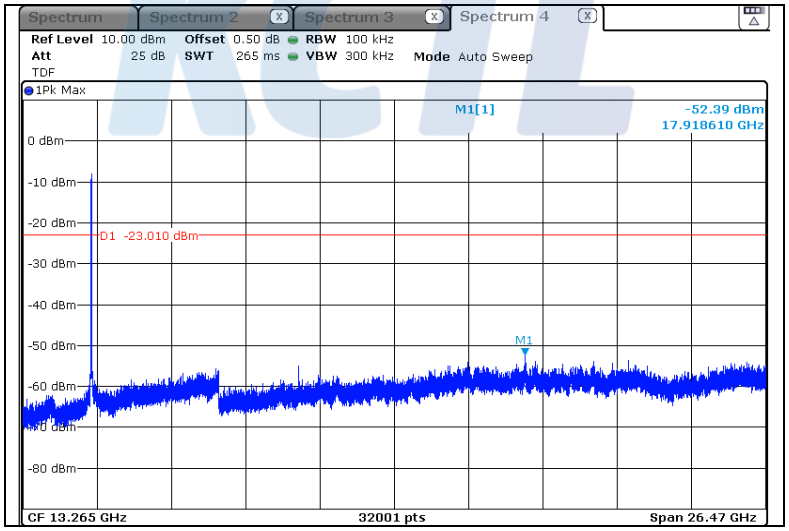


Band-edge



- Result of 2 483.5 ㎒

Conducted Spurious Emissions



5.6 Conducted Emission

5.6.1 Regulation

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (㎒)	Conducted limit (㏈㎶)	
	Qausi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

5.6.2 Measurement Procedure

1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.

2) Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.

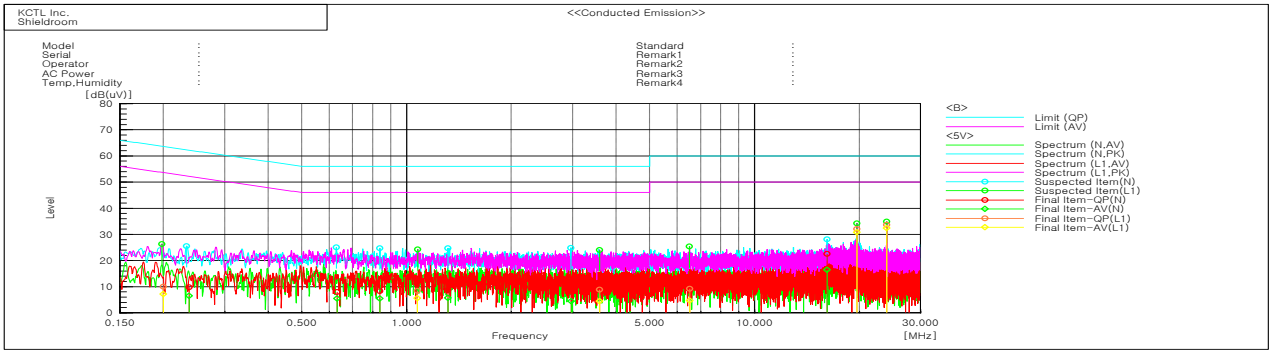
5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 ㎑ or to QUASI-PEAK and AVERAGE within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

5.6.3 Test Result

- Complied

Figure 6. plot of Conducted Emission

- Conducted worst-case data: 802.11g_Lowest channel (2 412 ㎒)_DC 5 V



Final Result

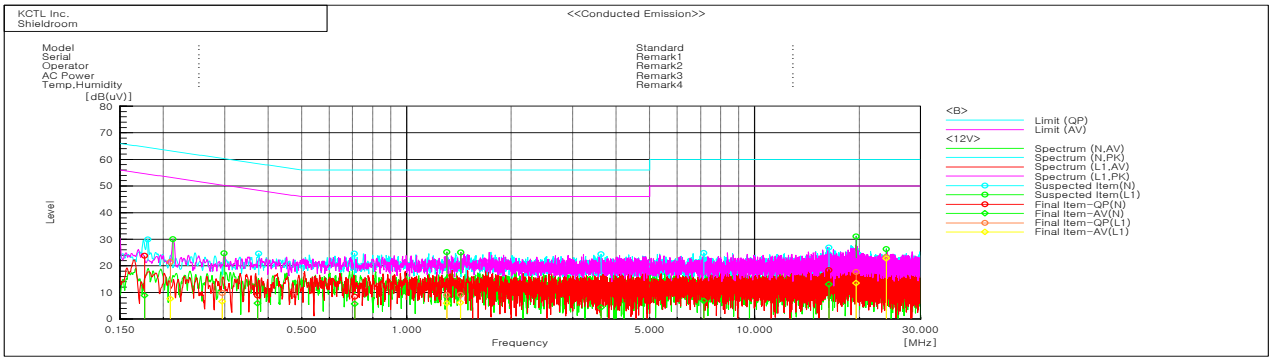
--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.2372	-0.2	-3.4	9.9	9.7	6.5	62.2	52.2	52.5	45.7
2	0.63179	-2.1	-4.6	10.1	8.0	5.5	56.0	46.0	48.0	40.5
3	0.83668	-1.9	-4.6	10.1	8.2	5.5	56.0	46.0	47.8	40.5
4	1.31398	-1.3	-4.3	10.0	8.7	5.7	56.0	46.0	47.3	40.3
5	2.96911	-1.2	-5.6	10.0	8.8	4.4	56.0	46.0	47.2	41.6
6	16.16969	12.2	6.1	10.3	22.5	16.4	60.0	50.0	37.5	33.6

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19983	-0.2	-3.1	10.2	10.0	7.1	63.6	53.6	53.6	46.5
2	1.07255	-1.7	-4.5	10.0	8.3	5.5	56.0	46.0	47.7	40.5
3	3.58319	-1.1	-5.6	10.0	8.9	4.4	56.0	46.0	47.1	41.6
4	6.50718	-0.9	-5.4	10.1	9.2	4.7	60.0	50.0	50.8	45.3
5	19.67181	21.8	20.5	10.3	32.1	30.8	60.0	50.0	27.9	19.2
6	24.00089	23.3	22.1	10.3	33.6	32.4	60.0	50.0	26.4	17.6

- Conducted worst-case data: 802.11g_Lowest channel (2 412 ㎒)_DC 12 V



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1766	13.5	-1.5	10.3	23.8	8.8	64.6	54.6	40.8	45.8
2	0.37335	-1.3	-4.2	10.1	8.8	5.9	58.4	48.4	49.6	42.5
3	0.70899	-1.8	-4.5	10.1	8.3	5.6	56.0	46.0	47.7	40.4
4	3.6179	-1.3	-5.7	10.0	8.7	4.3	56.0	46.0	47.3	41.7
5	7.14269	1.1	-3.3	10.1	11.2	6.8	60.0	50.0	48.8	43.2
6	16.3382	8.1	2.7	10.3	18.4	13.0	60.0	50.0	41.6	37.0

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.20963	11.3	-2.6	10.1	21.4	7.5	63.2	53.2	41.8	45.7
2	0.29515	-0.2	-3.3	9.9	9.7	6.6	60.4	50.4	50.7	43.8
3	1.30367	-1.1	-4.1	10.0	8.9	5.9	56.0	46.0	47.1	40.1
4	1.42929	-0.9	-3.8	10.0	9.1	6.2	56.0	46.0	46.9	39.8
5	19.60159	7.3	3.1	10.3	17.6	13.4	60.0	50.0	42.4	36.6
6	23.90778	13.0	12.5	10.3	23.3	22.8	60.0	50.0	36.7	27.2

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6. Test equipment used for test

	Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
■	Spectrum Analyzer	R&S	FSV40	100988	19.01.05
■	Spectrum Analyzer	R&S	FSV40	100989	19.01.05
■	EMI TEST RECEIVER	R&S	ESCI 3	100710	18.08.24
■	EMI TEST RECEIVER	R&S	ESCI7	100732	18.08.24
■	EMI TEST RECEIVER	R&S	ESCI 3	101408	18.08.24
■	Wideband Power Sensor	R&S	NRP-Z81	102398	19.01.31
■	DC Power Supply	AGILENT	E3632A	MY40001543	18.07.06
■	Attenuator	R&S	DNF Dämpfungsglied 10 dB inN-50 Ohm	31210	18.05.15
■	Signal Generator	R&S	SMR40	100007	18.05.15
■	Vector Signal Generator	R&S	SMBV100A	257566	19.01.05
■	Horn Antenna	ETS.lindgren	3115	62589	18.11.21
■	Horn Antenna	ETS.lindgren	3116	00086635	18.04.25
■	Loop Antenna	R&S	HFH2-Z2	100355	20.01.31
■	Bilog Antenna	SCHWARZBECK	VULB9163	552	19.11.12
■	Attenuator	Agilent	8491B-003	2708A18758	18.06.10
■	AMPLIFIER	SONOMA	310N	186280	18.04.06
■	AMPLIFIER	SONOMA	310N	344922	18.08.25
■	Amplifier	L-3 Narda-MITEQ	AMF-7D-01001800-22-10P	2003683	18.06.12
■	Broadband PreAmplifier	SCHWARZBECK	BBV9718	216	18.08.01
■	Amplifier	L-3 Narda-MITEQ	JS44-18004000-33-8P	2000997	18.08.09
■	High Pass Filter	WT	WT-A1698-HS	WT160411001	18.05.15
■	Turn Table	Innco Systems	DT2000	79	-
■	Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
■	Turn Table	Innco Systems	DT2000	79	-
■	Antenna Mast	Innco Systems	MA4000-EP	303	-
■	TWO-LINE V-NETWORK	R&S	ENV216	101352	18.08.25
■	Cable Assembly	RadiAll	2301761768000PJ	-	-
■	Cable Assembly	HUER+SUHNER	SUCOFLEX 104	MY4342/4	-
■	Cable Assembly	RadiAll	2301762000PJ	1724.66	
■	Cable Assembly	Gigalane	RF-400	-	-

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