TEST REPORT

KCTL Inc.
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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1. Client

- Name : KAON Media Co.,Ltd.
- Address : KAONMEDIA Building, 513-4, Yatap-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, South Korea
- Date of Receipt : 2017-04-03

2. Use of Report : -

3. Name of Product and Model : Docsis cable modem / CG2001-AN22CC

4. Manufacturer and Country of Origin : KAON Media Co.,Ltd. / Korea

5. FCC ID : WQT-CG2001-AN22CC

6. Date of Test : 2017-05-01 to 2017-05-17

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 : Yongsung Lee (Signature)	Technical Manager Name : Changmin Kim (Signature)

2017-05-18

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2017-05-18	Originally issued	-

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1. Client information

Applicant:	KAON Media Co.,Ltd.
Address:	KAONMEDIA Building, 513-4, Yatap-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, South Korea
Telephone number:	82-31-724-8874
Contact person:	Heeseok Yang / hsyang@kaonmedia.com

Manufacturer:	KAON Media Co.,Ltd.
Address:	KAONMEDIA Building, 513-4, Yatap-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, South Korea

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

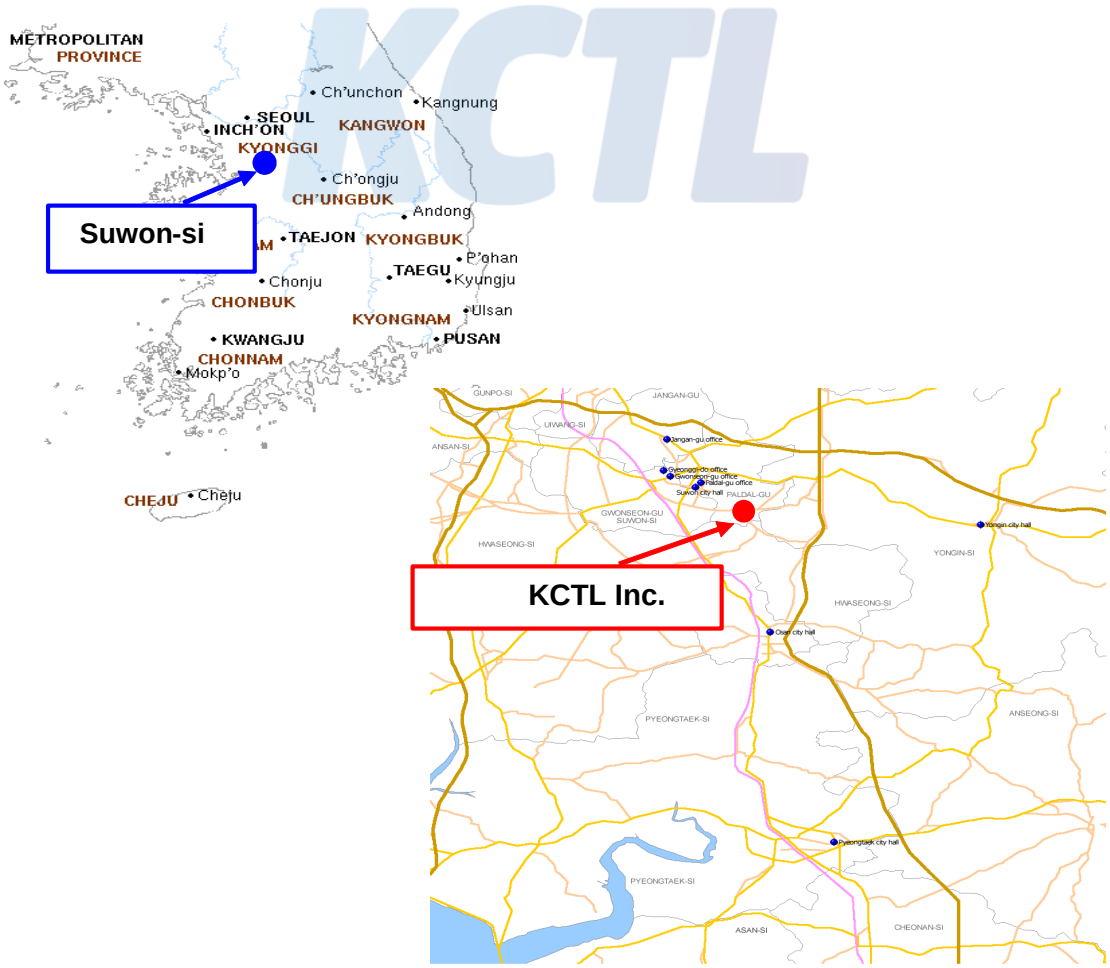
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

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:	KAON Media Co.,Ltd.
Address of Applicant	KAONMEDIA Building, 513-4, Yatap-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, South Korea
Manufacturer	KAON Media Co.,Ltd.
Address of Manufacturer	KAONMEDIA Building, 513-4, Yatap-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, South Korea
Type of equipment	Docsis cable modem
Basic Model	CG2001-AN22CC
Variant Model[1)]	CG2001, CG2001-AN2NC, CG2001-AN21C, CG2001-AN22C, CG2001-AN2NB, CG2001-AN21B, CG2001-AN22B, CG2001-SN2NB, CG2001-SN21B, CG2001-SN22B, CG2001-UN2NB, CG2001-UN21B, CG2001-UN22B, CG2001-LN2NB, CG2001-LN21B, CG2001-LN22B, CG2001-UN2NC, CG2001-UN21C, CG2001-UN22C
Serial number	N/A

1) Variant model names are different only for the marketing area, and all model names are electrically identical in construction, radio characteristics, and features.

3.2 General description

Frequency Range	2 412 ㎒ ~ 2 462 ㎒ (802.11b/g/n_HT20), 2 422 ㎒ ~ 2 452 ㎒ (802.11n_HT40)
Type of Modulation	DSSS (802.11b), OFDM (802.11g/n_HT20/n_HT40)
Number of Channels	11 ch (802.11b/g/n_HT20), 7 ch (802.11n_HT40)
Type of Antenna	PCB Antenna
Antenna Gain	ANT 0 : 1.9 ㏈i (2 400 ㎒ ~ 2 483.5 ㎒) ANT 1 : 1.9 ㏈i (2 400 ㎒ ~ 2 483.5 ㎒)
Transmit Power	14.37 ㏈m e.i.r.p.
Power supply	DC 12.00 V
Product SW/HW version	1.0.3 / 1.0
Radio SW/HW version	1.0.3 / 1.0
Test SW Version	MTool 2.0.1.5
RF power setting in TEST SW	Default

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

3.3 Test frequency

Mode	Test Frequency [㎒]		
	Lowest	Middle	Highest
802.11b	2 412	2 437	2 462
802.11g	2 412	2 437	2 462
802.11n HT20	2 412	2 437	2 462
802.11n HT40	2 422	2 437	2 452

3.4 Test Voltage

Mode	Voltage
Nominal Voltage	DC 12.00 V

4. Summary of test results

4.1 Standards & results

FCC Rule Reference	IC Rule Reference	Parameter	Report Section	Test Result
15.203, 15.247(b)(4)	-	Antenna Requirement	5.1	C
15.247(b)(3)	RSS-247, 5.4(4)	Maximum Peak Output Power	5.2	C
15.247(e)	RSS-247, 5.2	Peak Power Spectral Density	5.3	C
15.247(a)(2)	RSS-247, 5.2	6 dB Channel Bandwidth	5.4	C
-	RSS-247, 5.2	Occupied Bandwidth	5.4	C
15.247(d), 15.205(a), 15.209(a)	RSS-247, 5.5 RSS-GEN,8.9, 10	Spurious Emission, Band Edge, and Restricted bands	5.5	C
15.207(a)	RSS-GEN, 8.8	Conducted Emissions	5.6	C
Note$_{1)}$: C = complies, NC = Not complies, NT = Not tested, NA = Not Applicable				

- The general test methods used to test this device is ANSI C63.10:2013

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 PCB antenna(internal antenna).
The total directional peak gain of the antenna not exceeds 6.0 dBi

	ANT 0	MIMNO (ANT 0+1)
ANT Gain	1.9 dBi	1.9 dBi

According to KDB 662911 D01 Multiple Transmitter Output v02r01

- Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

In case of 2 Tx MIMO

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

Total gain = 4.91 dBi (individual gain(1.9 dBi) + Array gain(3.01 dBi))

For power measurements on IEEE 802.11 devices

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

Total gain = 1.9 dBi (individual gain(1.9 dBi) + Array gain(0 dBi))

For power measurements on all other devices:

Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

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 Maximum conducted (average) output power

5.2.2.1.1 General

§15.247 permits the maximum conducted (average) output power to be measured as an alternative to the maximum peak conducted output power for demonstrating compliance to the limit. When this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth (see ANSI C63.10 for measurement guidance).
When using a spectrum analyzer or EMI receiver to perform these measurements, it shall be capable of utilizing a number of measurement points in each sweep that is greater than or equal to twice the span/RBW to set a bin-to-bin spacing of ≤ RBW/2 so that narrowband signals are not lost between frequency bins

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level. The intent is to test at 100 % duty cycle; however a small reduction in duty cycle (to no lower than 98 %) is permitted, if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.
If continuous transmission (or at least 98 % duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level, with the transmit duration as long as possible, and the duty cycle as high as possible during which sweep triggering/signal gating techniques may be used to perform the measurement over the transmission duration.

5.2.2.1.2 Measurement using a spectrum analyzer (SA)

5.2.2.1.2.1 Method AVGSA-1 (trace averaging with the EUT transmitting at full power throughout each sweep)

a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 x RBW.
d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

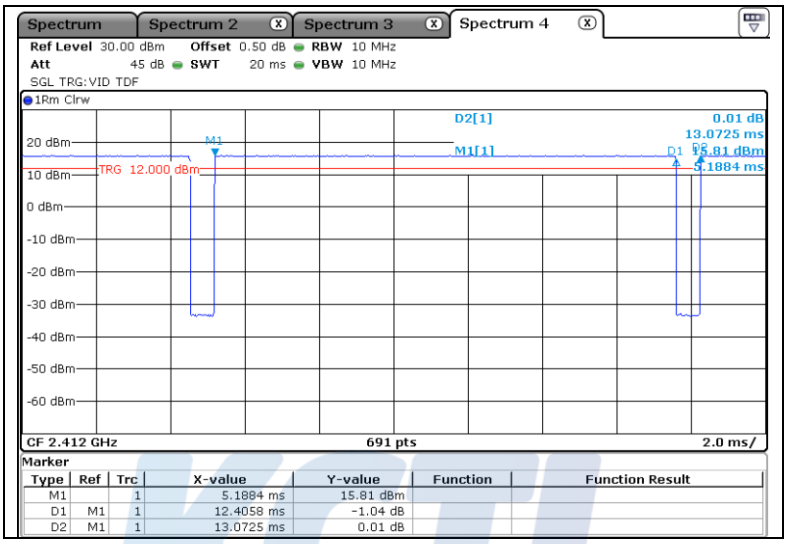
5.2.2.1.2.2 Method AVGSA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)

a)Measure the duty cycle, x, of the transmitter output signal as described in 6.0.
b) Set span to at least 1.5 times the OBW.
c) Set RBW = 1-5% of the OBW, not to exceed 1 ㎒.
d) Set VBW ≥ 3 x RBW.
e) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
f) Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to “free run”.
i) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.
j) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
k) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 ㏈ if the duty cycle is 25 %.

- Duty Cycle Correction Factor

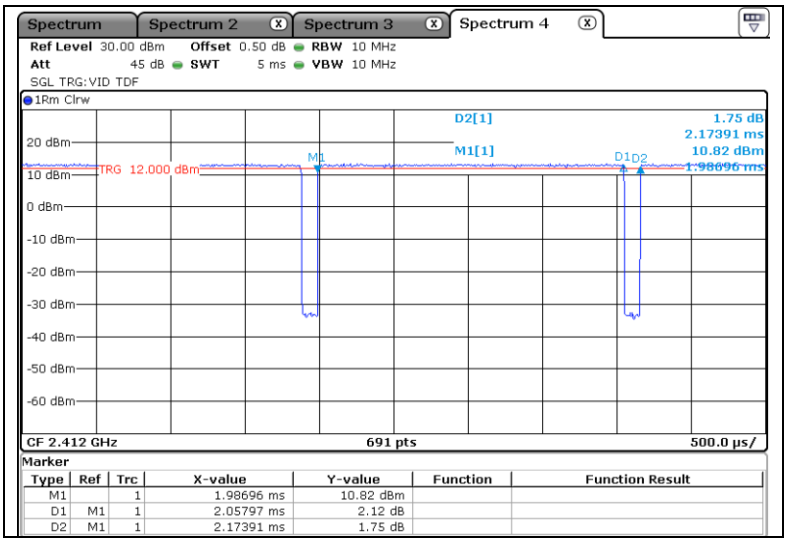
- ANT 0

- 802.11b



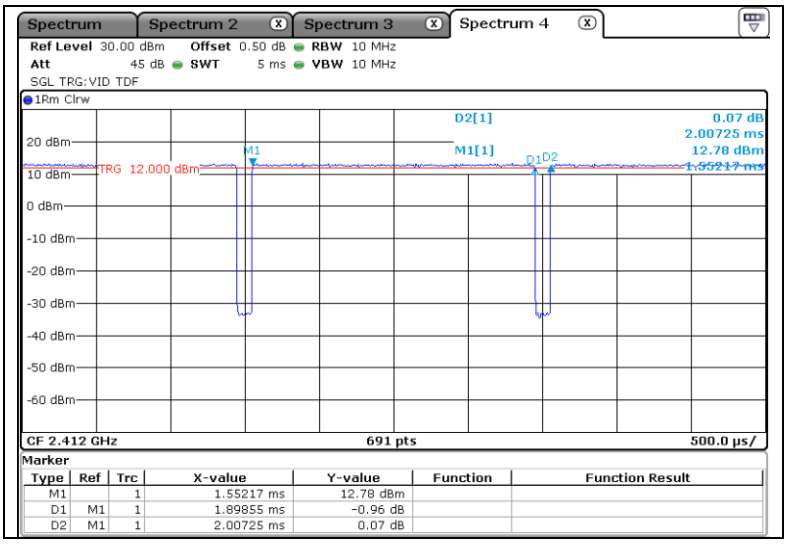
Note$_{1)}$: period : 13.07 ms, On time : 12.41 ms
Note$_{2)}$: DCCF = 10 log(1 / x) = 10 log(13.07 / 12.41) = 0.04, x = 0.99

- 802.11g



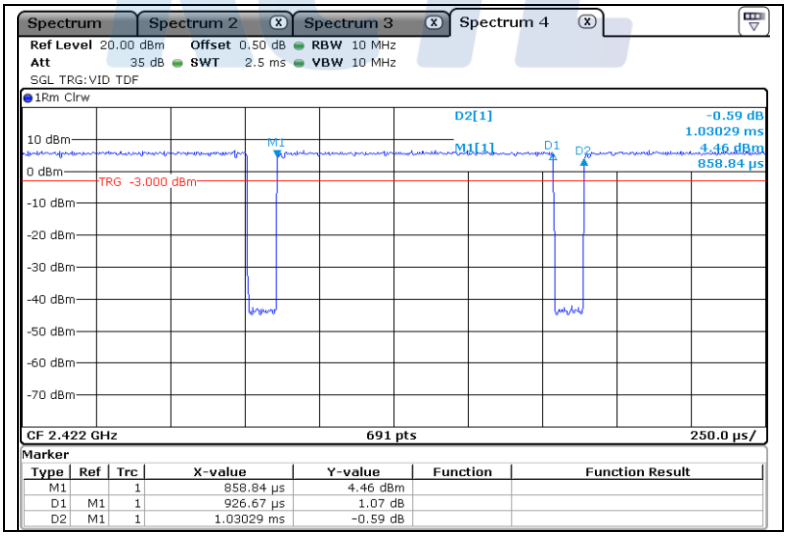
Note$_{1)}$: period : 2.18 ms, On time : 2.06 ms
Note$_{2)}$: DCCF = 10 log(1 / x) = 10 log(2.18 / 2.06) = 0.07, x = 0.98

- 802.11n HT20



Note$_{1)}$: period : 2.01 ms, On time : 1.90 ms
Note$_{2)}$: DCCF = 10 log(1 / x) = 10 log(2.01 / 1.90) = 0.08, x = 0.98

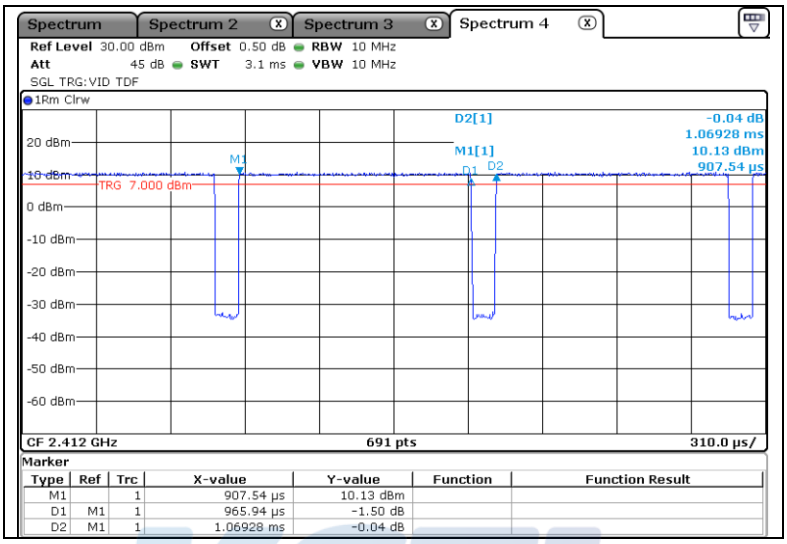
- 802.11n HT40



Note$_{1)}$: period : 1.03 ms, On time : 0.927 ms
Note$_{2)}$: DCCF = 10 log(1 / x) = 10 log(1.03 / 0.927) = 0.16, x = 0.96

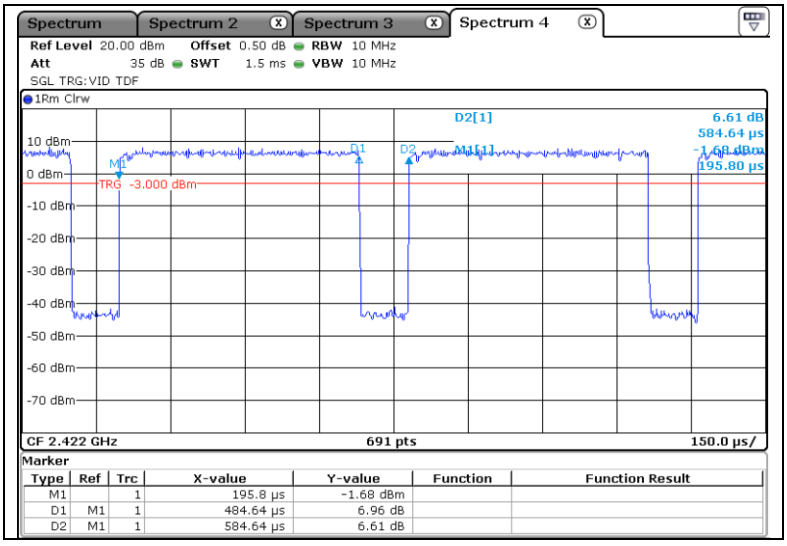
- MIMO (ANT 0+1)

- 802.11n HT20



- Note1) : period : 1.07 ms, On time : 0.966 ms
- Note2) : DCCF = 10 log(1 / x) = 10 log(1.07 / 0.966) = 0.16, x = 0.97

- 802.11n HT40



- Note1) : period : 0.585 ms, On time : 0.485 ms
- Note2) : DCCF = 10 log(1 / x) = 10 log(0.585 / 0.485) = 0.26, x = 0.94

5.2.3 Test Result

- Complied

ANT 0

- 802.11b

Channel	Frequency [㎒]	Avarage Power [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	12.97	0.23	13.20	30.00	16.80
Middle	2 437	12.56	0.23	12.79	30.00	17.21
Highest	2 462	12.57	0.23	12.80	30.00	17.20

- 802.11g

Channel	Frequency [㎒]	Avarage Power [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	11.28	0.24	11.52	30.00	18.48
Middle	2 437	10.75	0.24	10.99	30.00	19.01
Highest	2 462	10.72	0.24	10.96	30.00	19.04

- 802.11n_HT20

Channel	Frequency [㎒]	Avarage Power [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	11.33	0.24	11.57	30.00	18.43
Middle	2 437	10.63	0.24	10.87	30.00	19.13
Highest	2 462	10.75	0.24	10.99	30.00	19.01

- 802.11n_HT40

Channel	Frequency [㎒]	Avarage Power [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	9.72	0.46	10.18	30.00	19.82
Middle	2 437	9.42	0.46	9.88	30.00	20.12
Highest	2 462	9.26	0.46	9.72	30.00	20.28

MIMO (ANT 0+1)

- 802.11n_HT20

Channel	Frequency [㎒]	Avarage Power _ANT 0 [dBm]	Avarage Power _ANT 1 [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	11.11	10.71	0.44	14.37	30.00	15.63
Middle	2 437	10.71	10.30	0.44	13.96	30.00	16.04
Highest	2 462	10.74	10.42	0.44	14.03	30.00	15.97

- 802.11n_HT40

Channel	Frequency [㎒]	Avarage Power _ANT 0 [dBm]	Avarage Power _ANT 1 [dBm]	D.C.C.F [dBm]	Result [dBm]	Limit [dBm]	Margin [dB]
Lowest	2 412	9.45	9.37	0.81	13.24	30.00	16.76
Middle	2 437	8.98	9.01	0.81	12.82	30.00	17.18
Highest	2 462	9.27	8.87	0.81	12.90	30.00	17.10

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

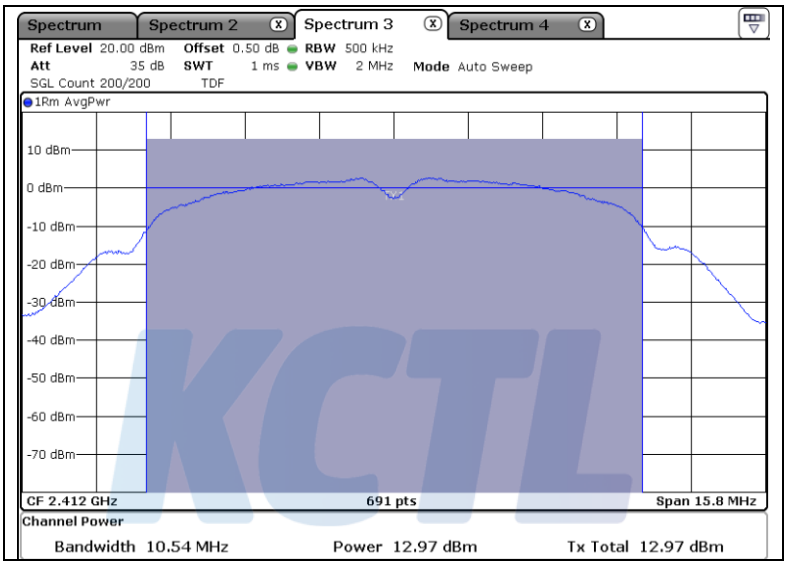
5.2.4 Test Plot

Figure 1. Plot of Maximum Peak Output Power

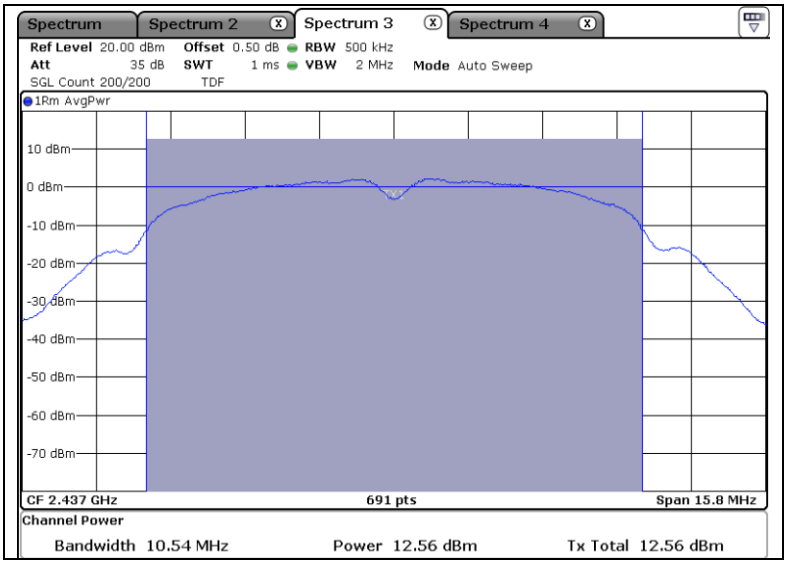
- ANT 0

- 802.11b

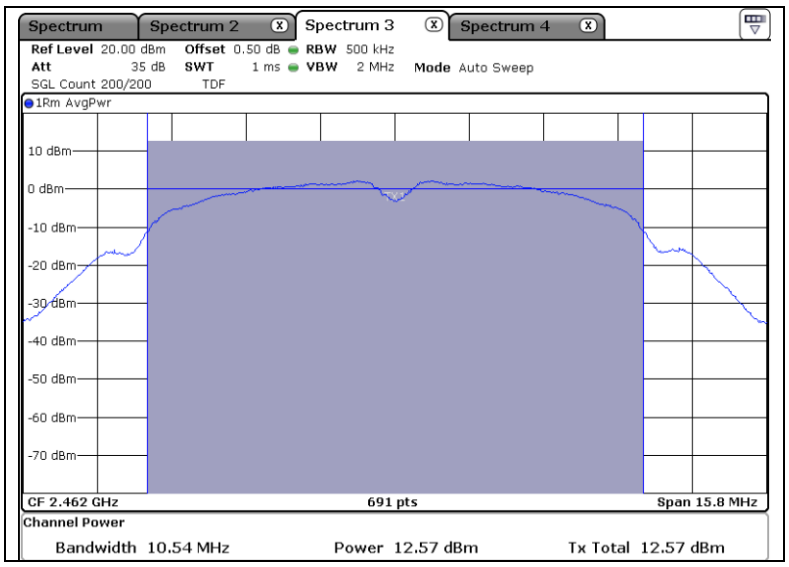
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

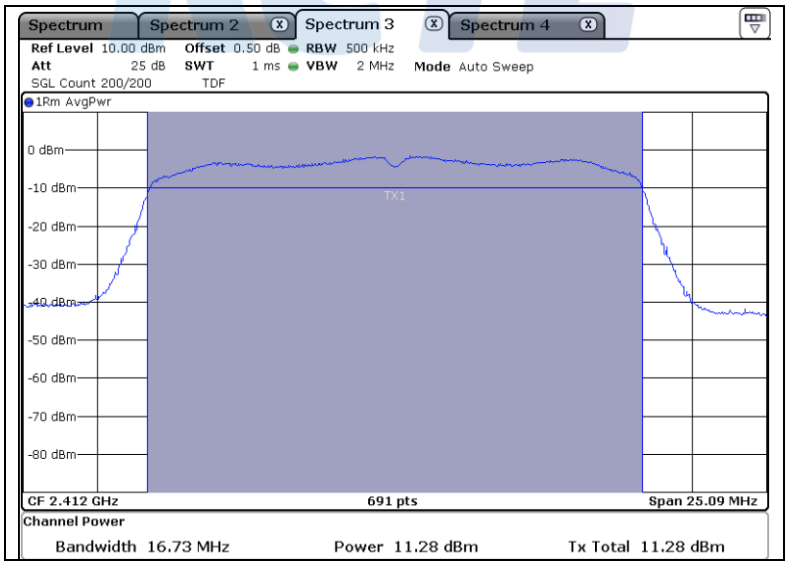


Highest Channel (2 462 ㎒)

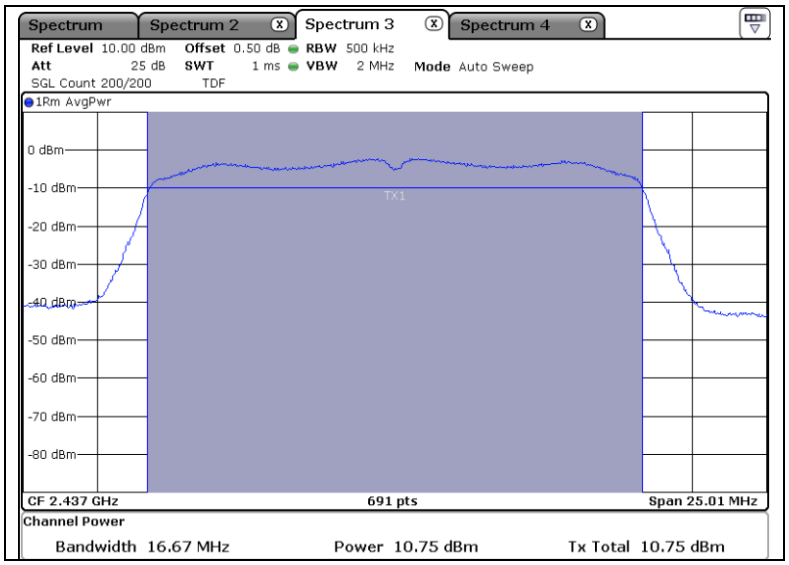


- 802.11g

Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



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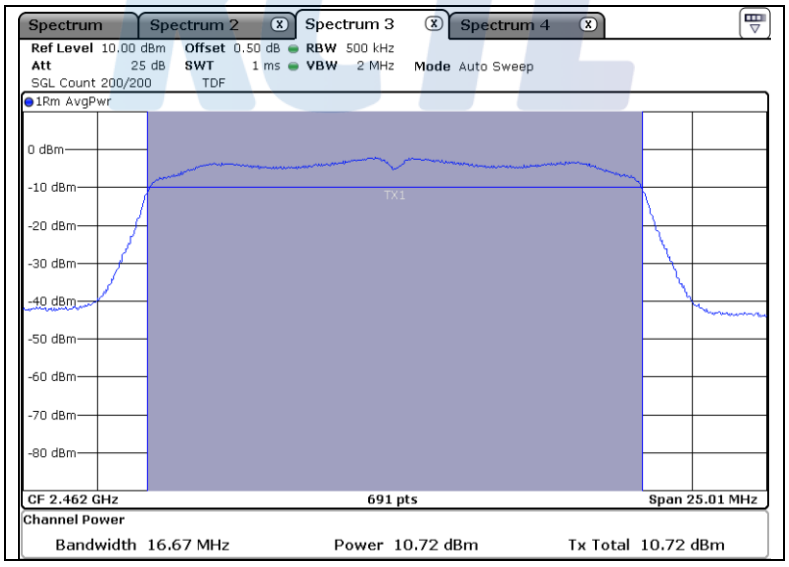
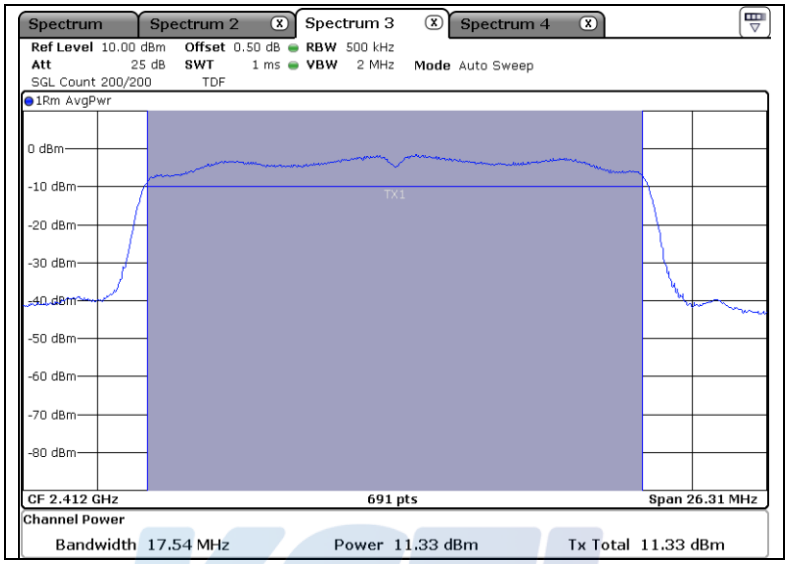
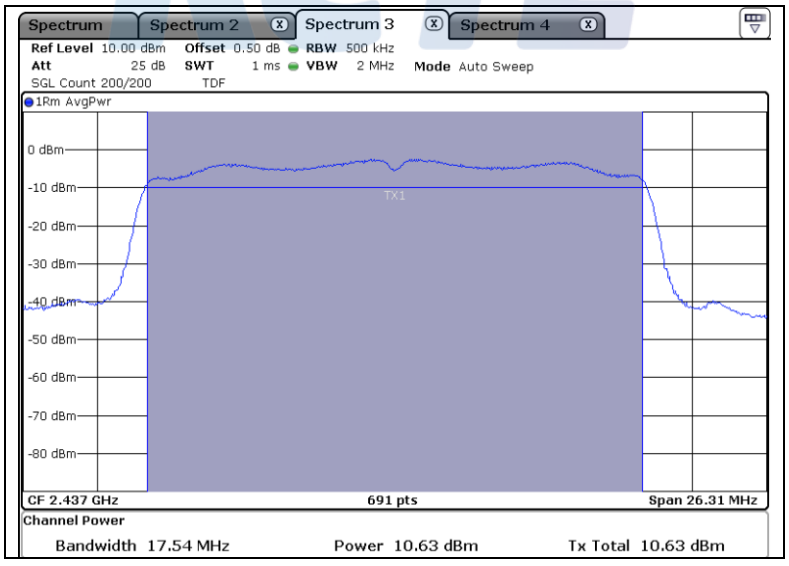


- 802.11n HT20

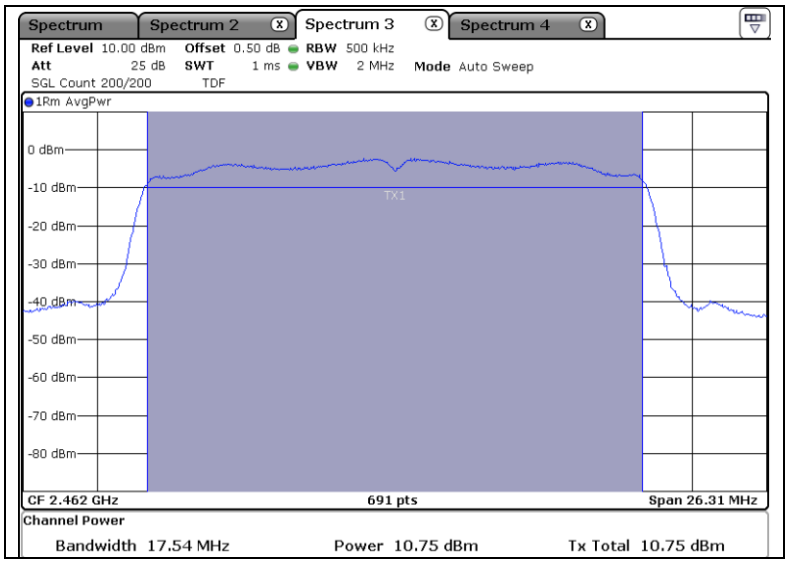
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

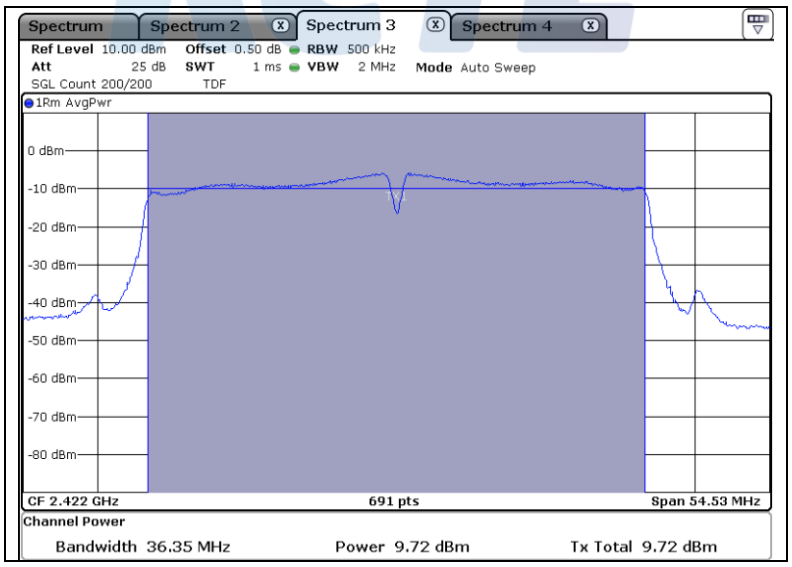


Highest Channel (2 462 ㎒)

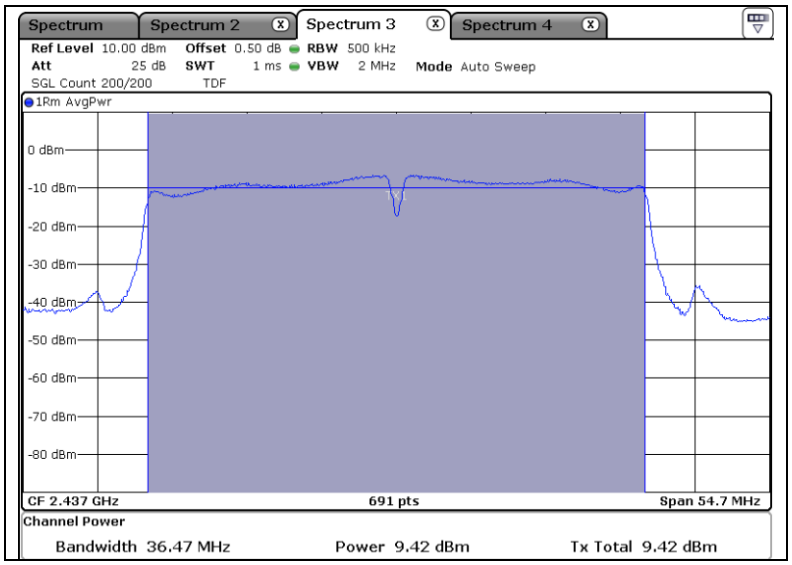


- 802.11n HT40

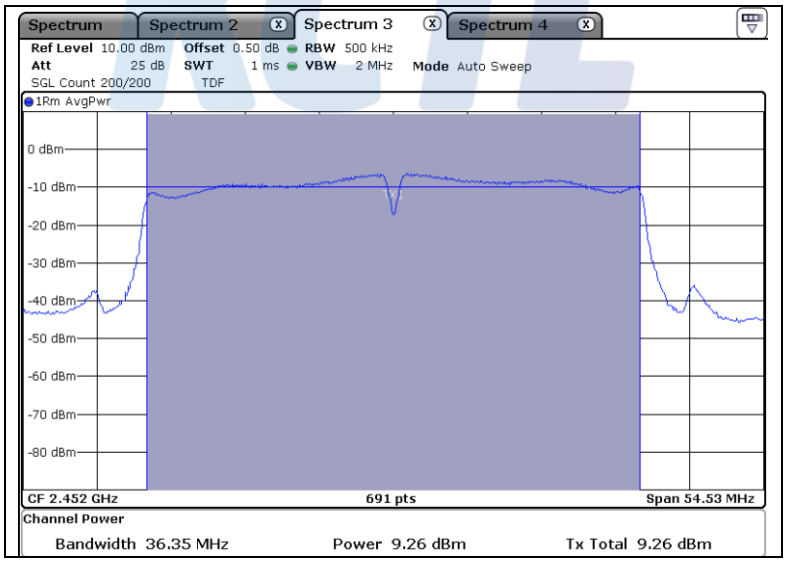
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



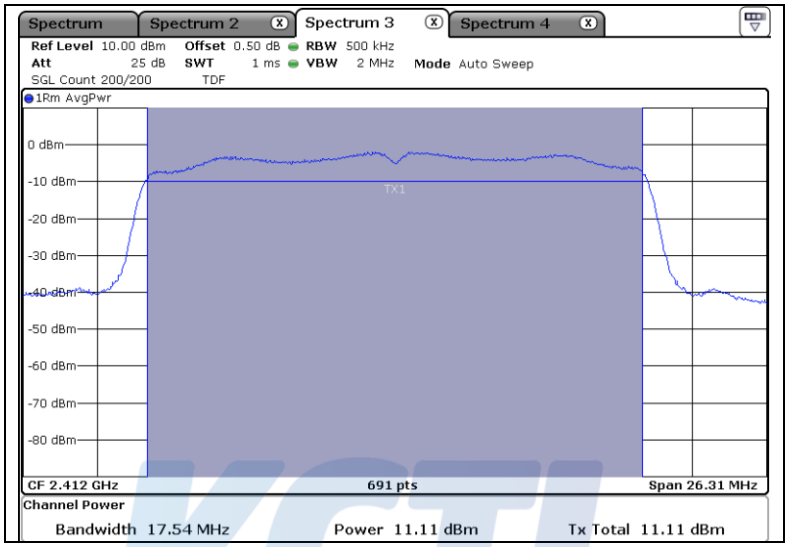
Highest Channel (2 452 ㎒)



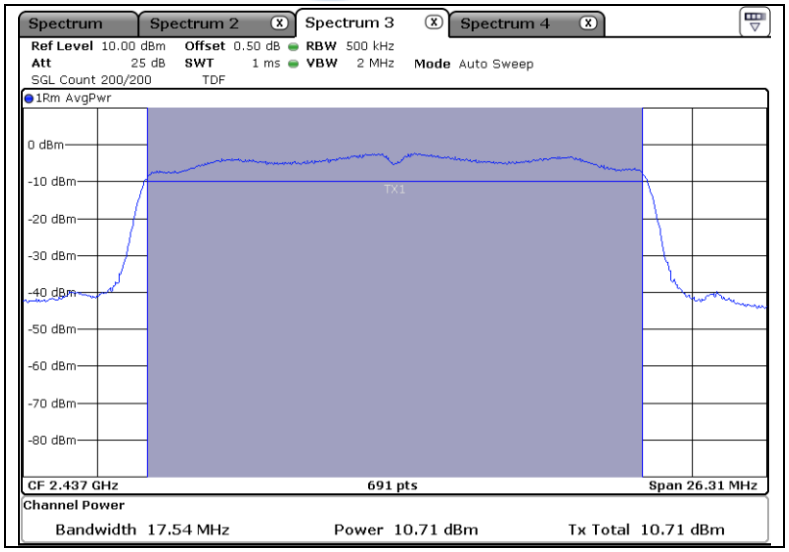
- MIMO 2 Tx (ANT 0)

- 802.11n HT20

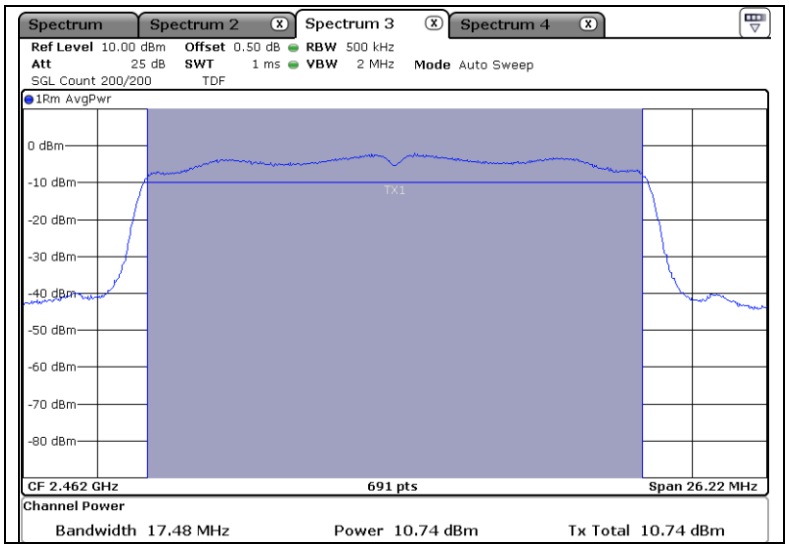
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

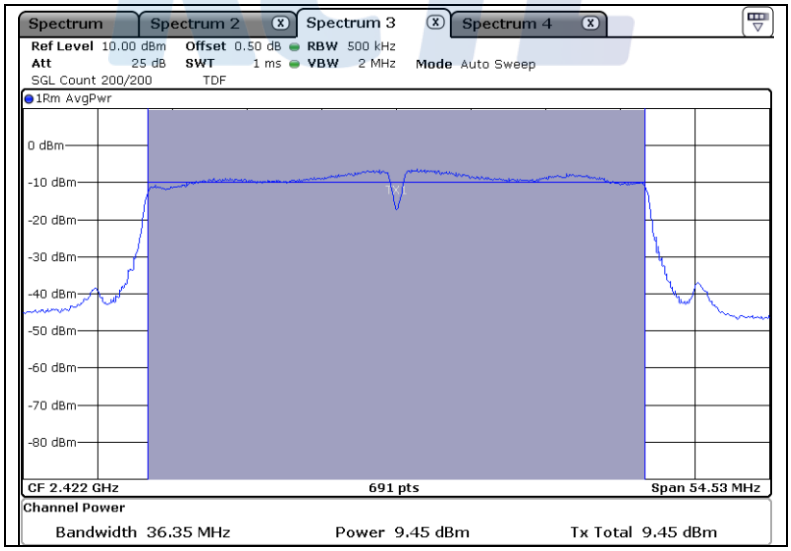


Highest Channel (2 462 ㎒)

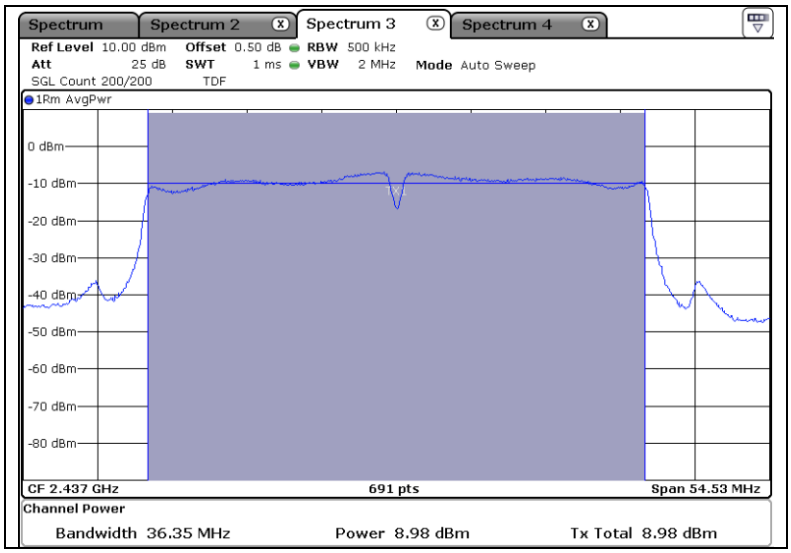


- 802.11n HT40

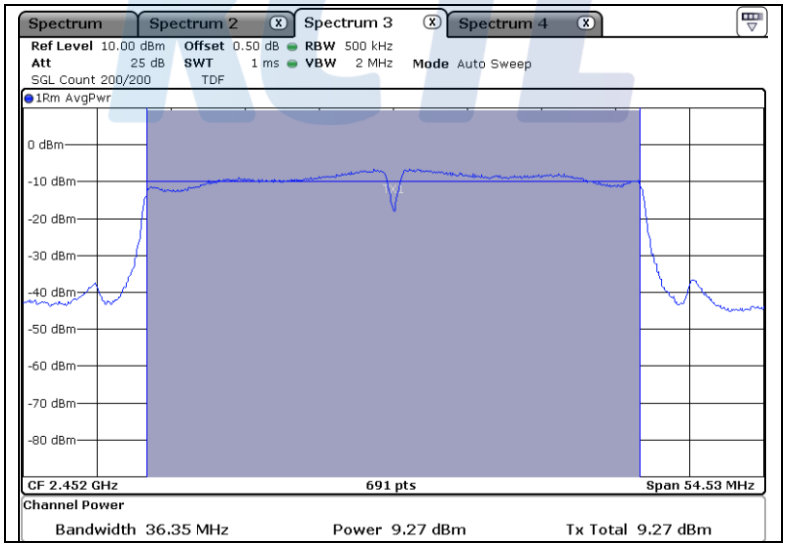
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



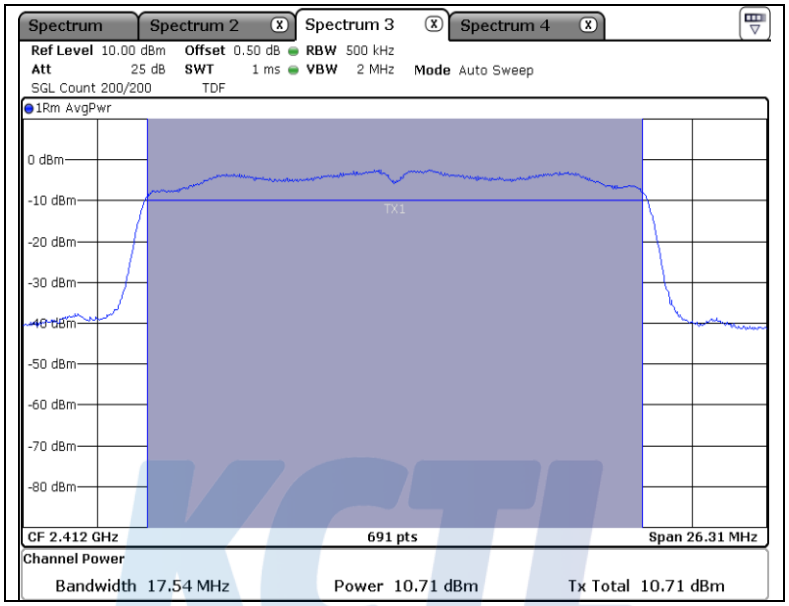
Highest Channel (2 452 ㎒)



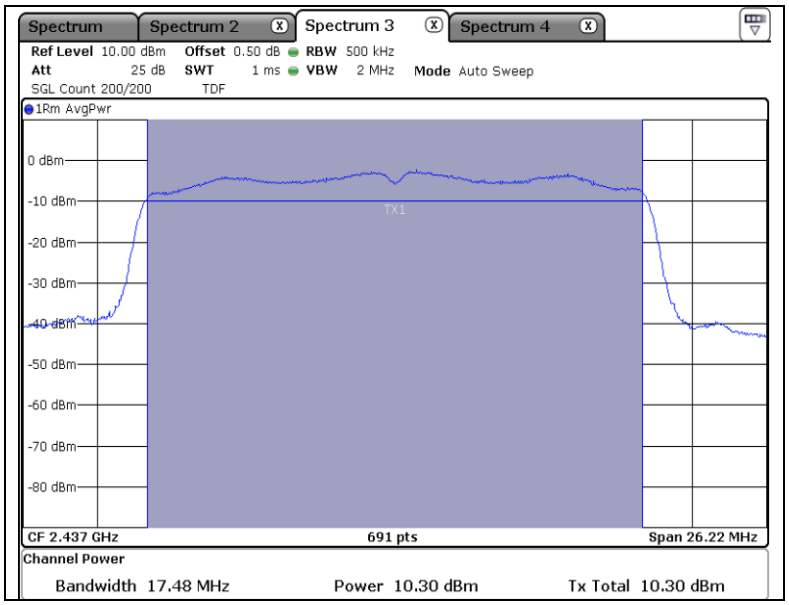
- MIMO 2 Tx (ANT 1)

- 802.11n HT20

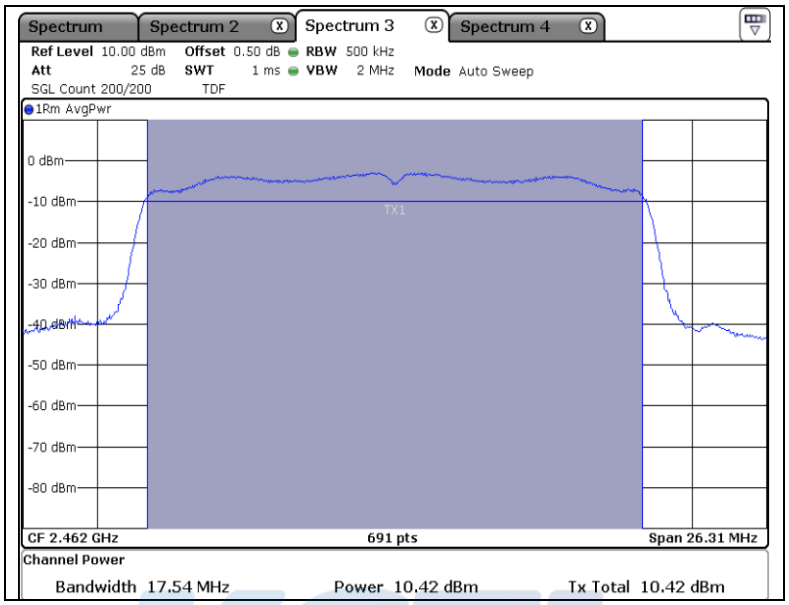
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

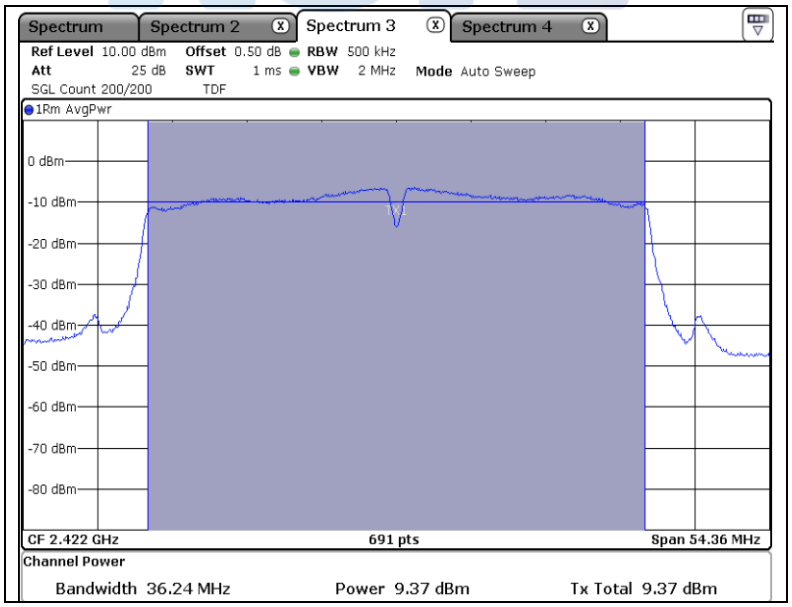


Highest Channel (2 462 ㎒)

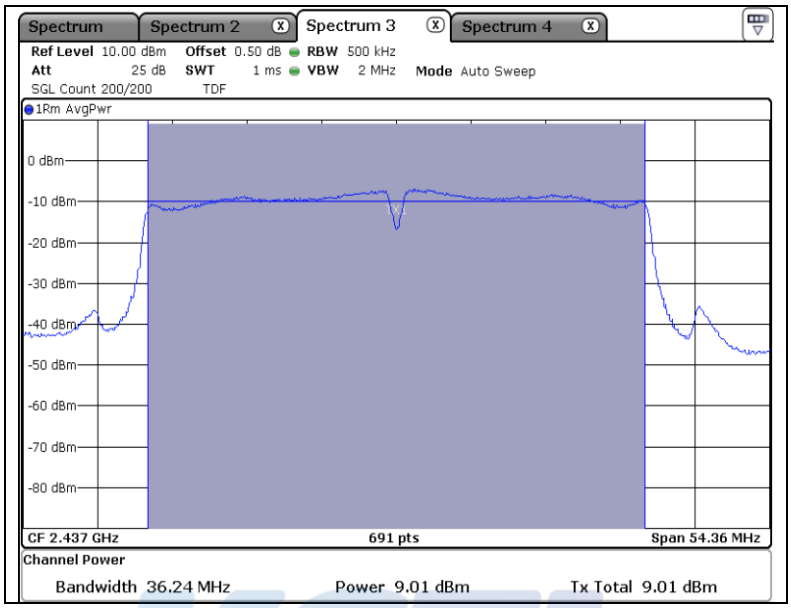


- 802.11n HT40

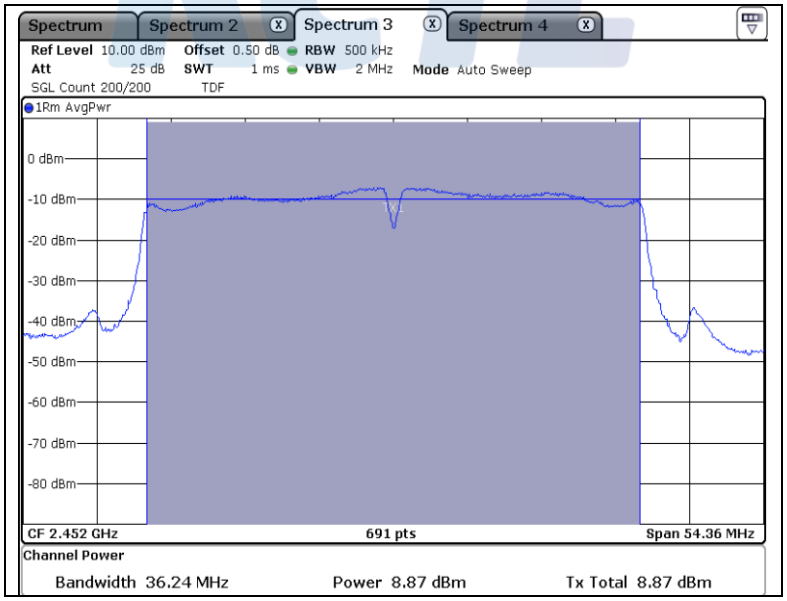
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



Highest Channel (2 452 ㎒)



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 ㏈m 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

ANT 0

- 802.11b

Channel	Frequency [㎒]	Result (RBW=3 ㎑) [dB m]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-7.10	8.00	15.10
Middle	2 437	-7.20	8.00	15.20
Highest	2 462	-8.56	8.00	16.56

- 802.11g

Channel	Frequency [㎒]	Result (RBW=3 ㎑) [dB m]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-12.05	8.00	20.05
Middle	2 437	-13.21	8.00	21.21
Highest	2 462	-11.81	8.00	19.81

- 802.11n_HT20

Channel	Frequency [㎒]	Result (RBW=3 ㎑) [dB m]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-11.90	8.00	19.90
Middle	2 437	-12.54	8.00	20.54
Highest	2 462	-11.95	8.00	19.95

- 802.11n_HT40

Channel	Frequency [㎒]	Result (RBW=3 ㎑) [dB m]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 422	-15.29	8.00	23.29
Middle	2 437	-15.56	8.00	23.56
Highest	2 452	-15.39	8.00	23.39

MIMO (ANT 0+1_

- 802.11n_HT20

Channel	Frequency [㎒]	**ANT 0** Result	**ANT 1** Result	Result (RBW=3 ㎑) [dBm]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-10.29	-12.48	-8.24	8.00	16.24
Middle	2 437	-12.05	-12.77	-9.38	8.00	17.38
Highest	2 462	-11.84	-12.63	-9.21	8.00	17.21

- 802.11n_HT40

Channel	Frequency [㎒]	**ANT 0** Result	**ANT 1** Result	Result (RBW=3 ㎑) [dBm]	Limit [dBm/3 ㎑]	Margin [dB]
Lowest	2 412	-14.87	-14.98	-11.91	8.00	19.91
Middle	2 437	-16.27	-16.26	-13.25	8.00	21.25
Highest	2 462	-15.09	-16.64	-12.79	8.00	20.79

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

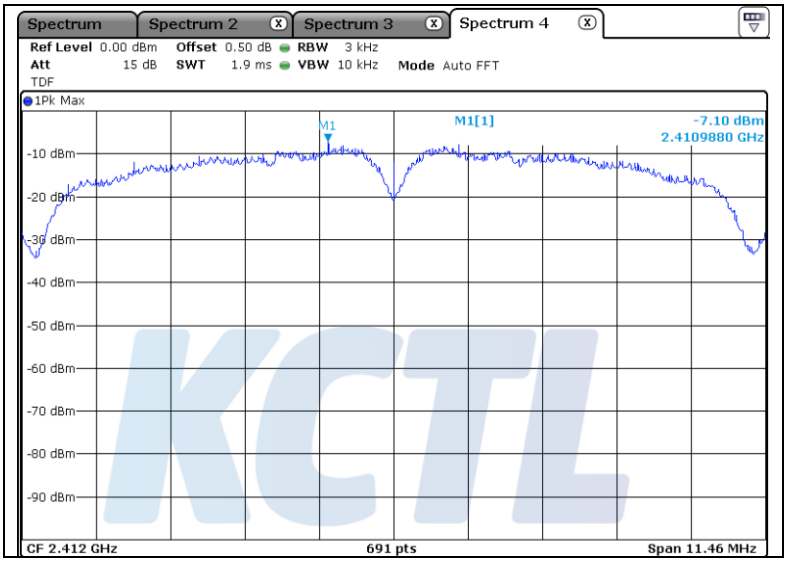
5.3.4 Test Plot

Figure 1. Plot of the Power Density

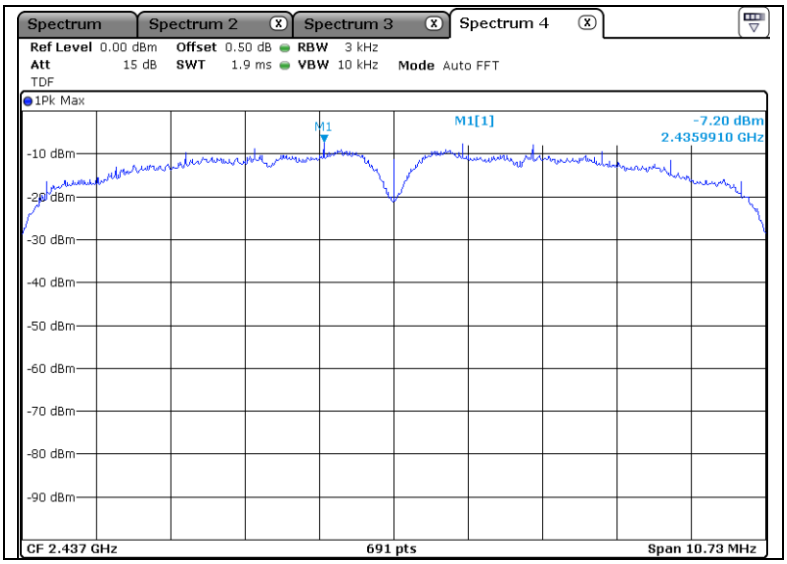
ANT 0

- 802.11b

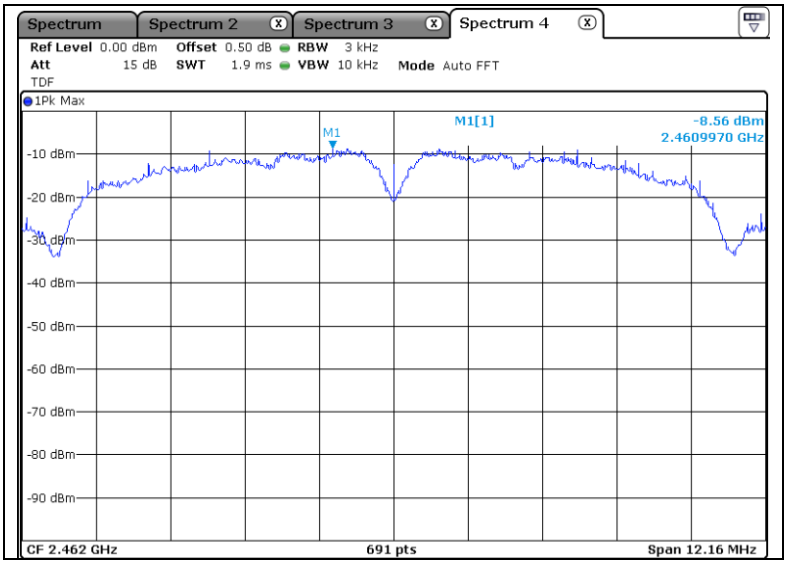
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

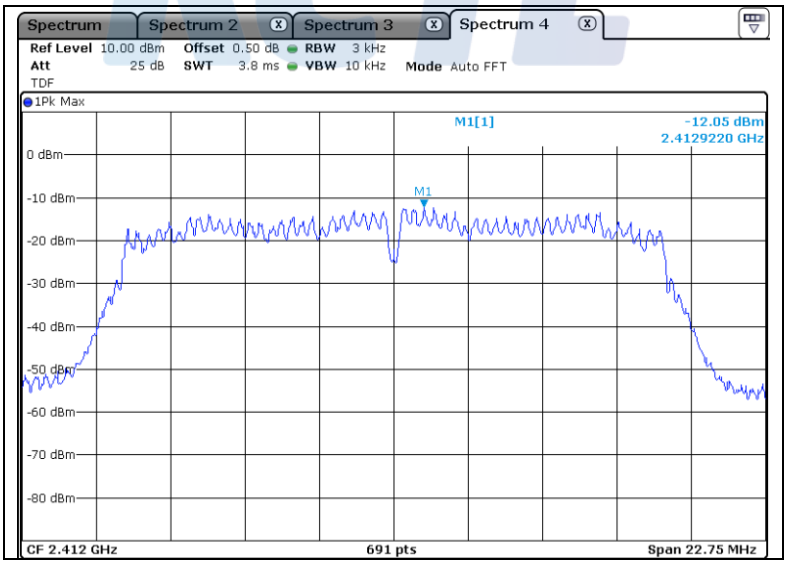


Highest Channel (2 462 ㎒)

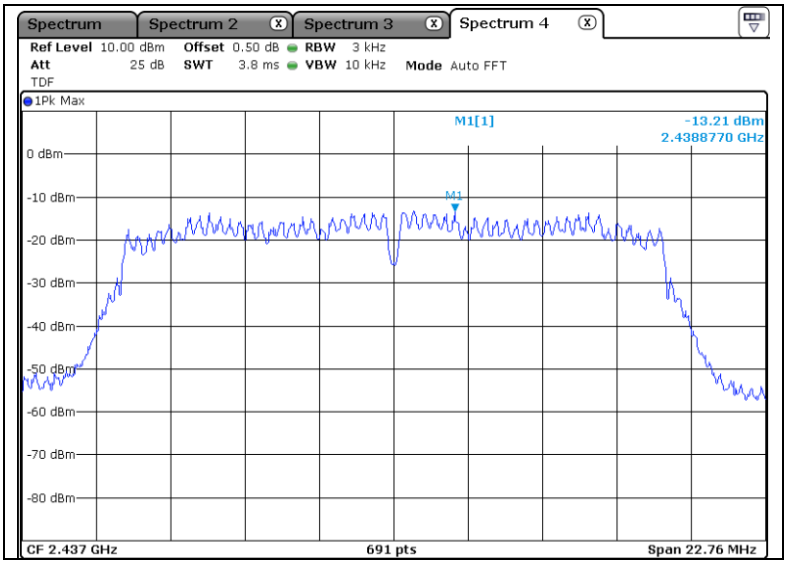


- 802.11g

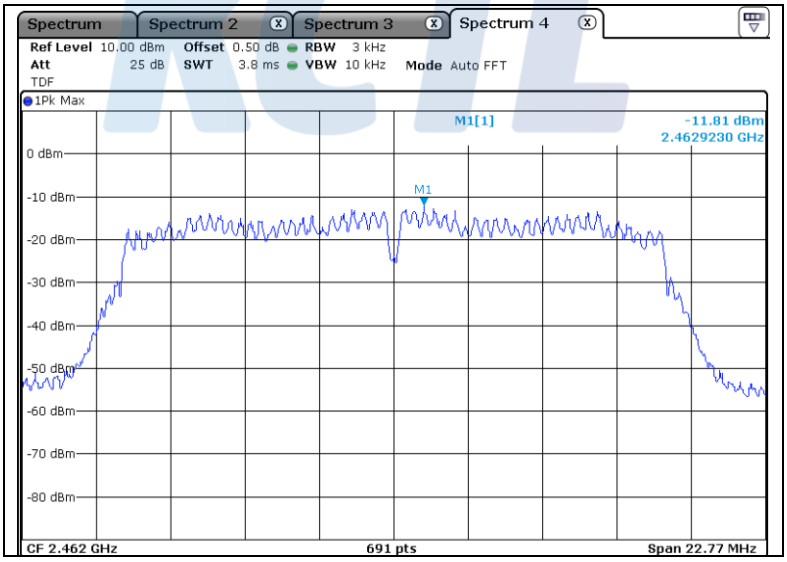
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

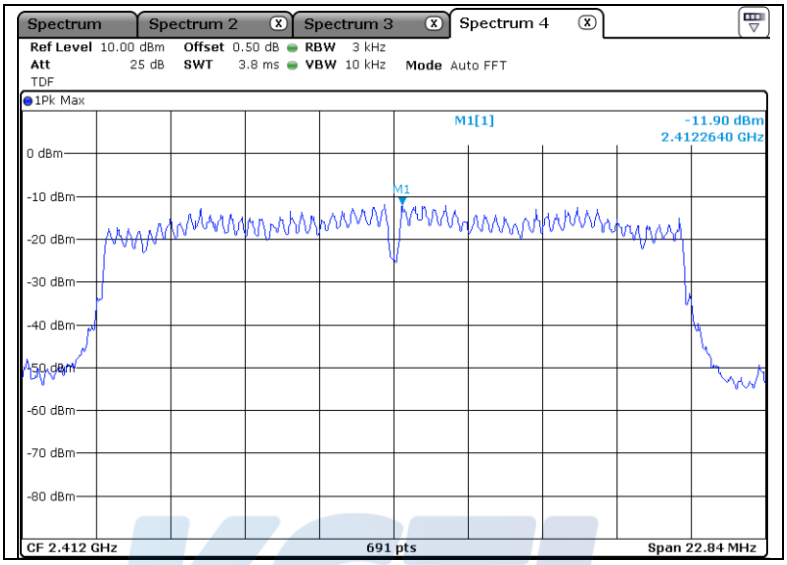


Highest Channel (2 462 ㎒)

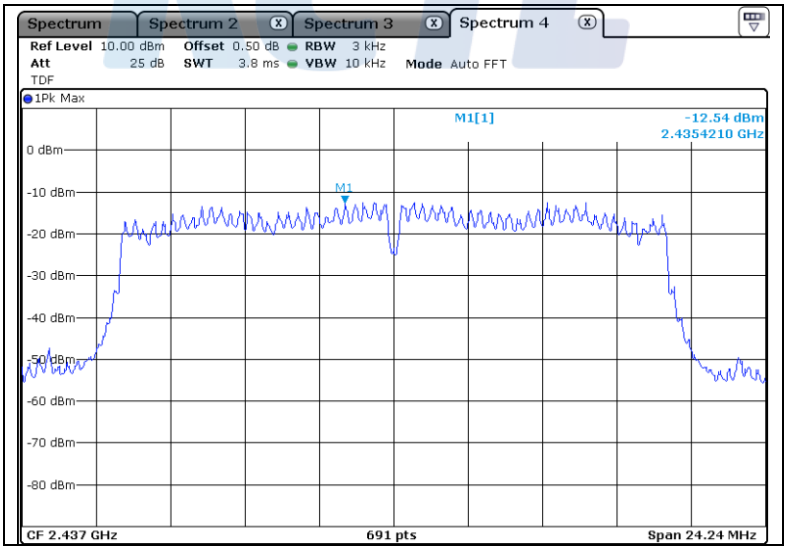


- 802.11n_HT20

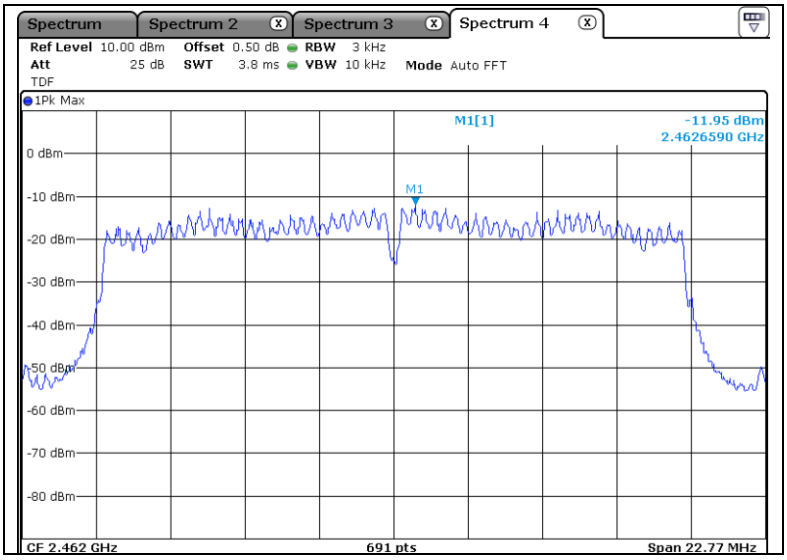
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

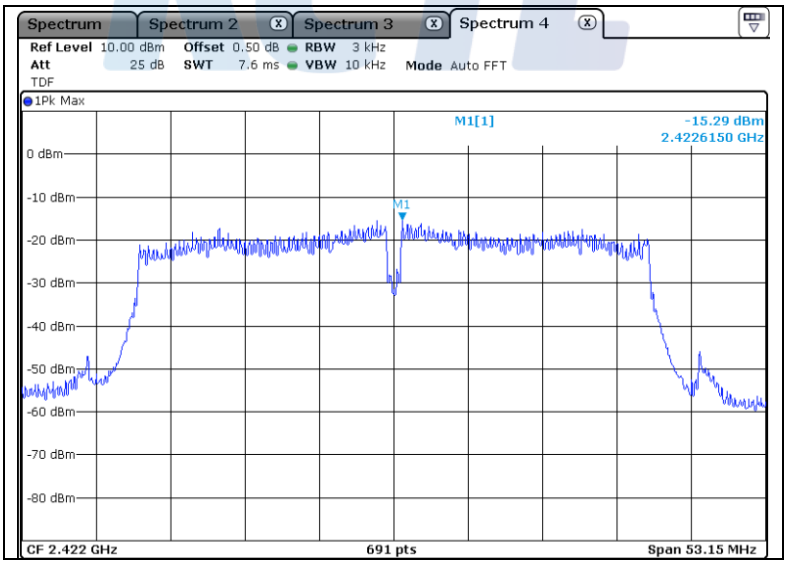


Highest Channel (2 462 ㎒)

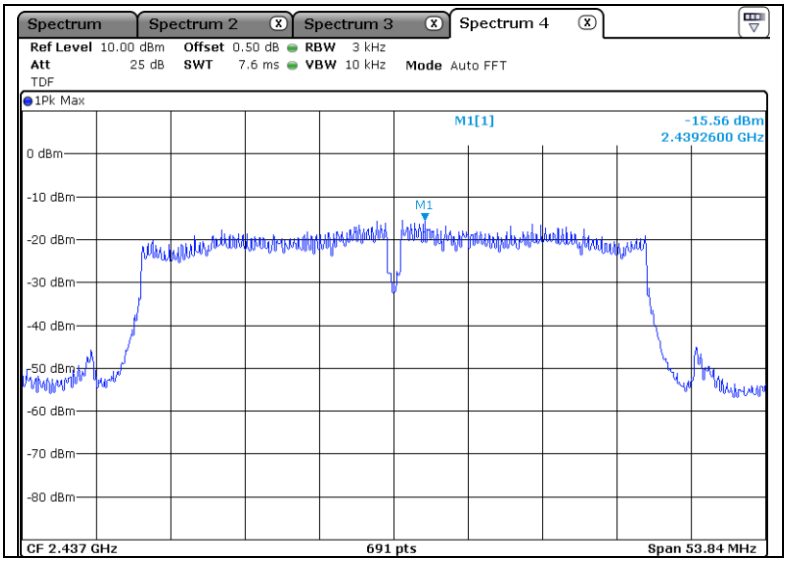


- 802.11n_HT40

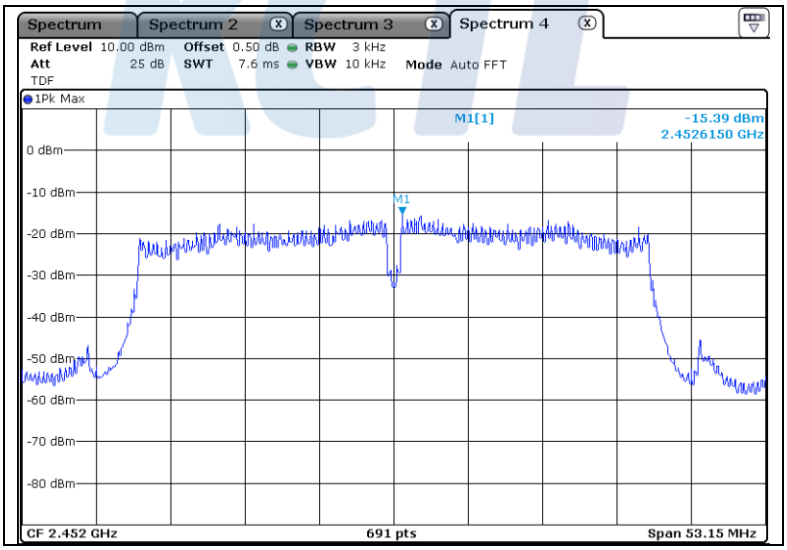
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



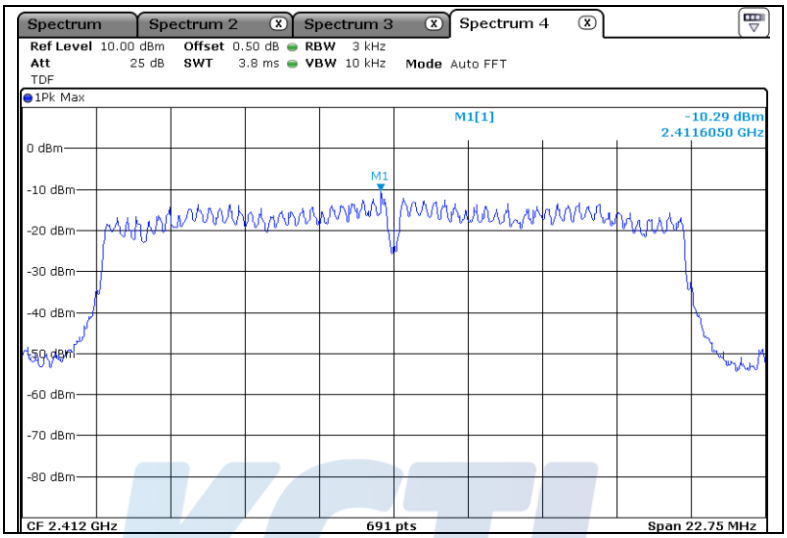
Highest Channel (2 452 ㎒)



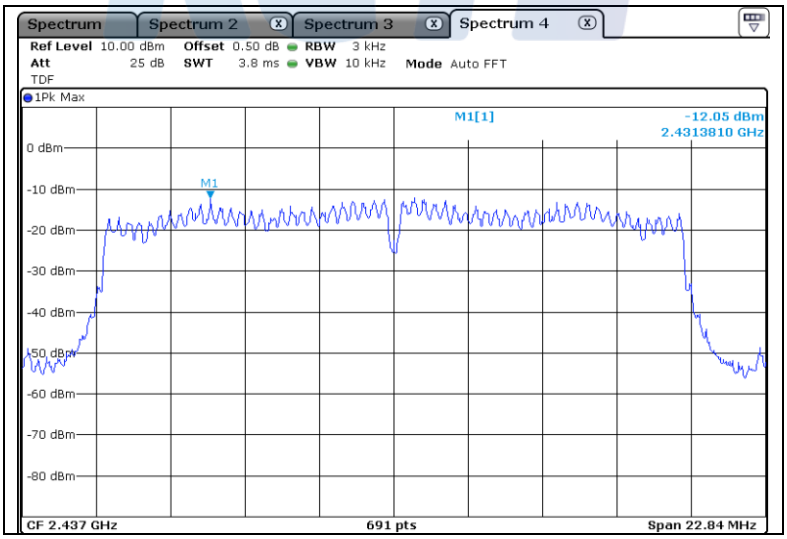
MIMO_ANT 0

- 802.11n_HT20

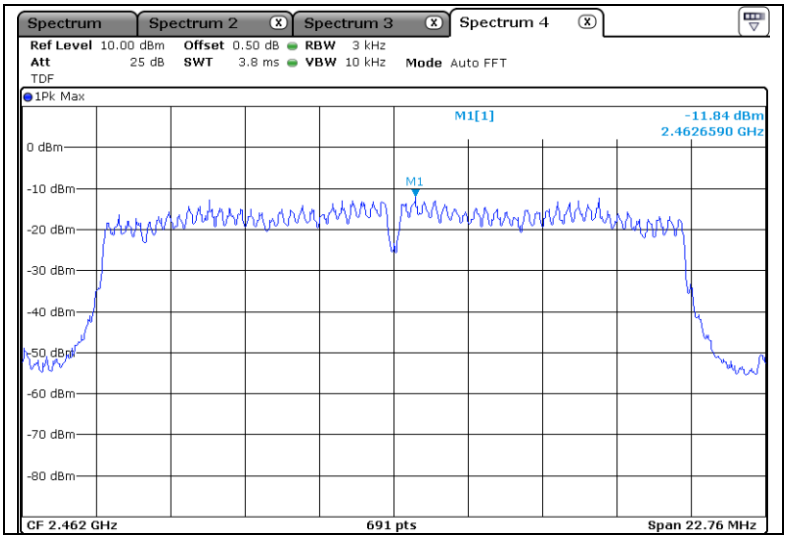
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

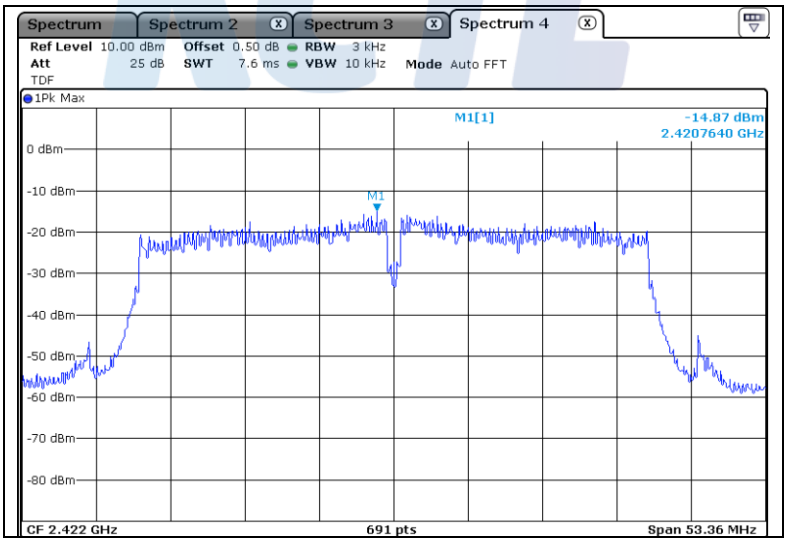


Highest Channel (2 462 ㎒)

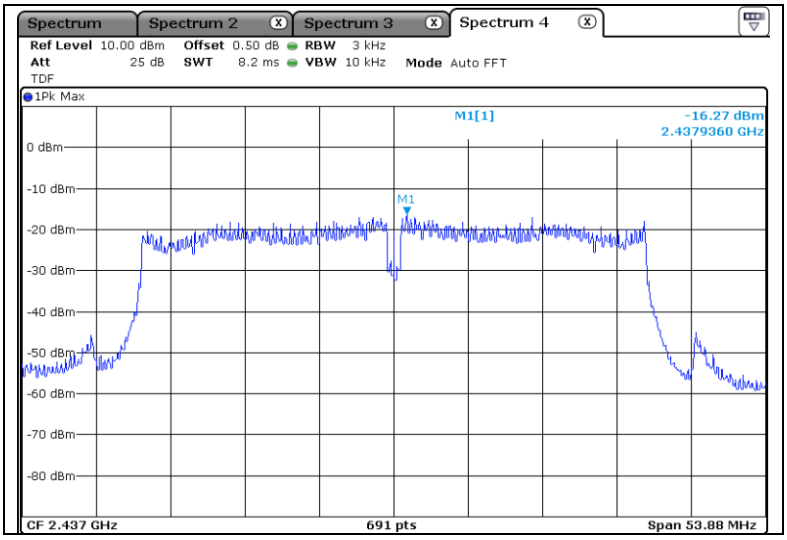


- 802.11n_HT40

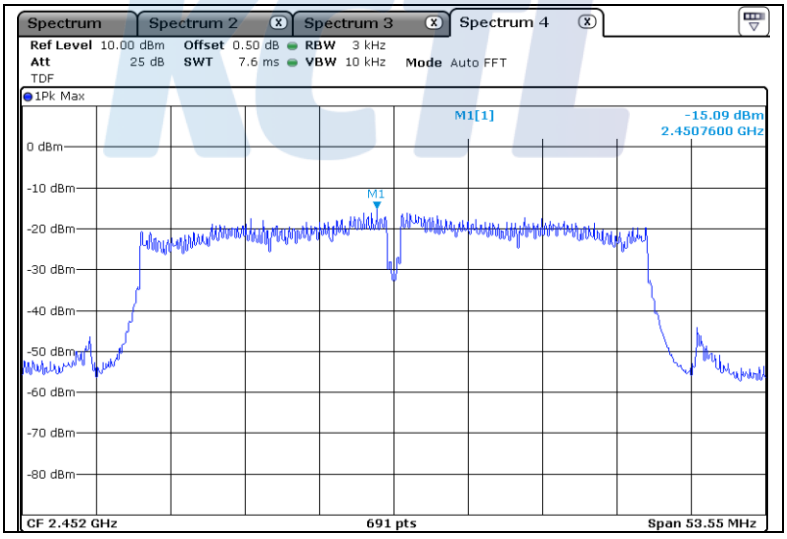
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



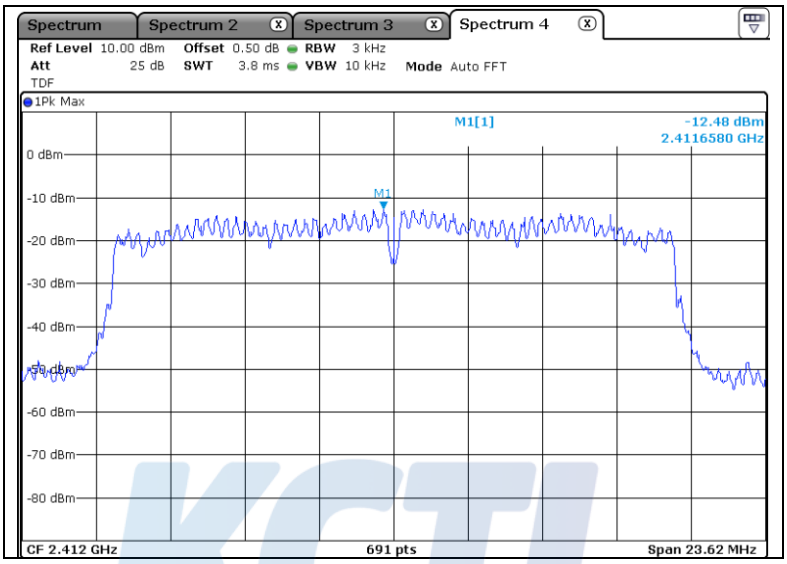
Highest Channel (2 452 ㎒)



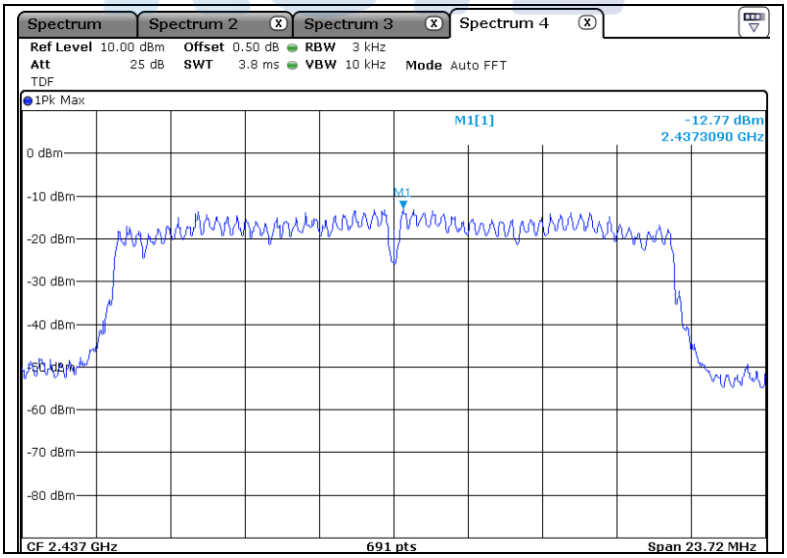
MIMO_ANT 1

- 802.11n_HT20

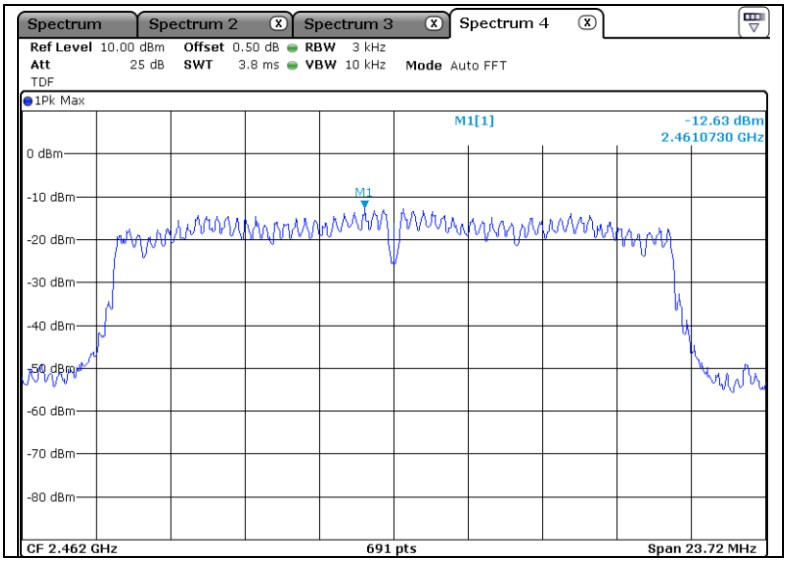
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

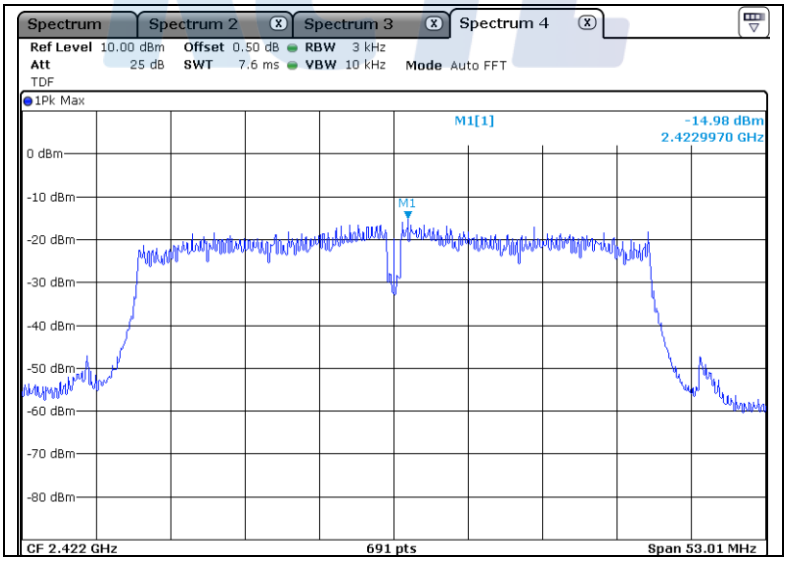


Highest Channel (2 462 ㎒)

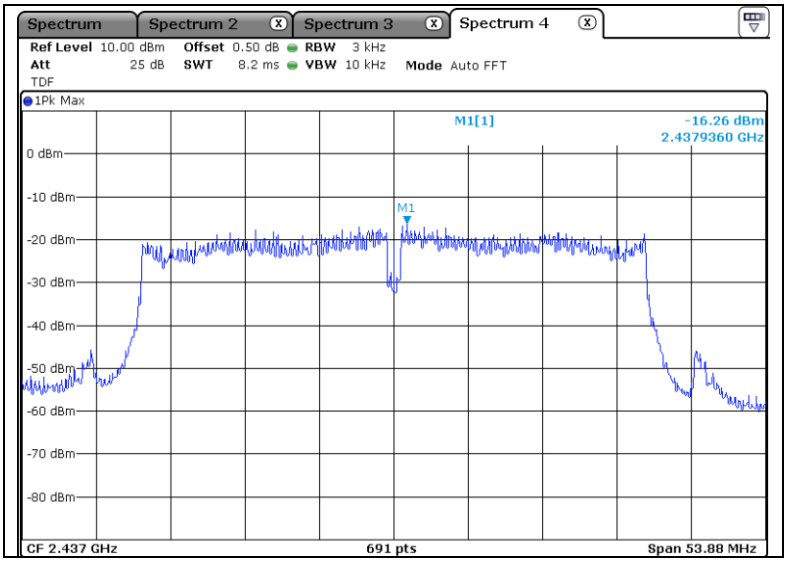


- 802.11n_HT40

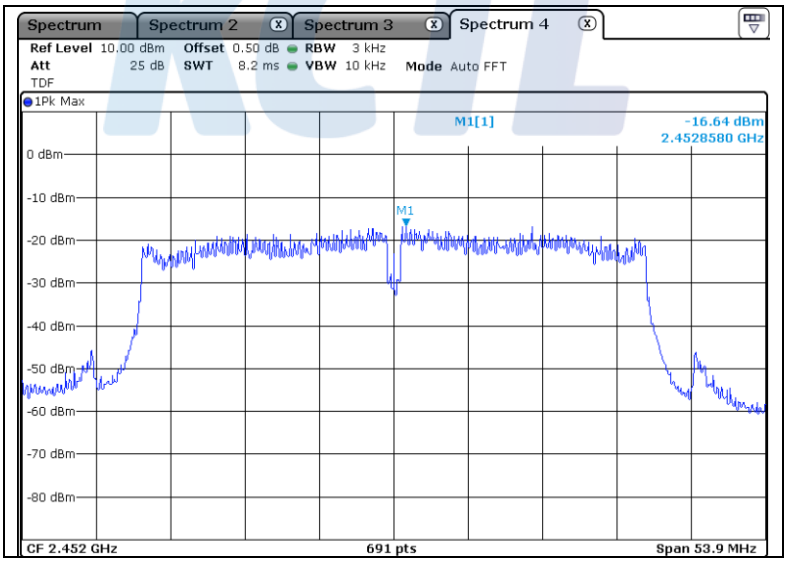
Lowest Channel (2 422 ㎒)



Middle Channel (2 437 ㎒)



Highest Channel (2 452 ㎒)



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 DTS Channel Bandwidth Measurement Procedure-Option 2

The automatic bandwidth measurement capability of an instrument may be employed using the X ㏈ bandwidth mode with X set to 6 ㏈, if the functionality described above (i.e., RBW = 100 ㎑, VBW ≥ 3 x RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 ㏈.

5.4.3 Test Result

- Complied

ANT 0

- 802.11b

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	7.64	0.50	10.54
Middle	2 437	7.16	0.50	10.54
Highest	2 462	8.10	0.50	10.54

- 802.11g

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	15.17	0.50	16.73
Middle	2 437	15.17	0.50	16.67
Highest	2 462	15.18	0.50	16.67

- 802.11n_HT20

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	15.22	0.50	17.54
Middle	2 437	16.16	0.50	17.54
Highest	2 462	15.18	0.50	17.54

- 802.11n_HT40

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 422	35.43	0.50	36.35
Middle	2 437	35.89	0.50	36.47
Highest	2 452	35.43	0.50	36.35

MIMO_ANT 0

- 802.11n_HT20

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 412	15.17	0.50	17.54
Middle	2 437	15.22	0.50	17.54
Highest	2 462	15.17	0.50	17.48

- 802.11n_HT40

Channel	Frequency [㎒]	6 ㏈ Bandwidth [㎒]	Min. Limit [㎒]	Occupied Bandwidth (99 % BW) [㎒]
Lowest	2 422	35.57	0.50	36.35
Middle	2 437	35.92	0.50	36.35
Highest	2 452	35.70	0.50	36.35

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

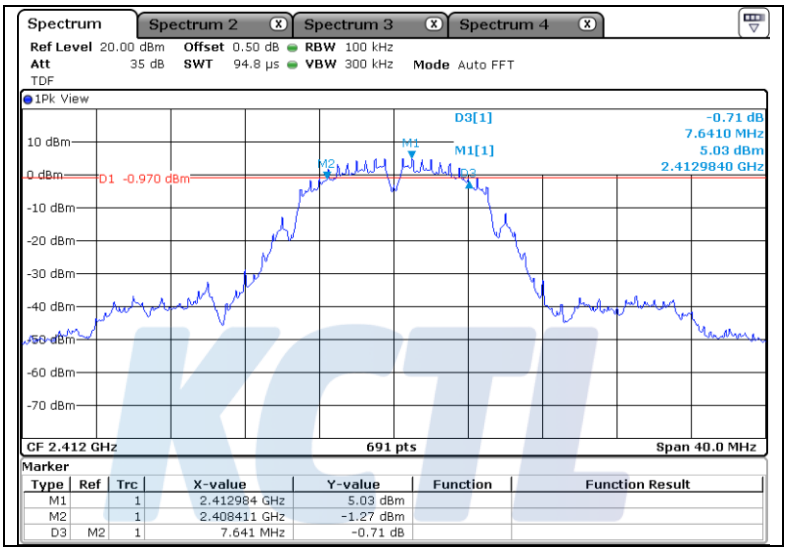
5.4.4 Test Plot

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

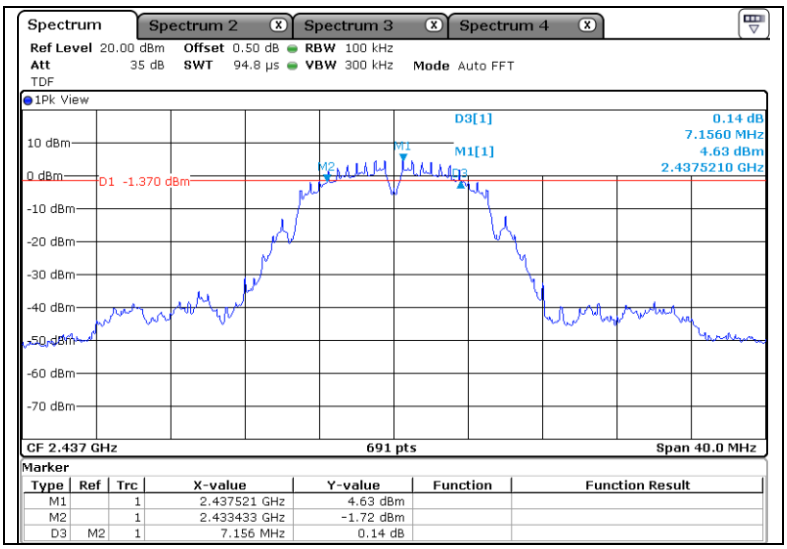
ANT 0

- 802.11b_6 ㏈ Bandwidth

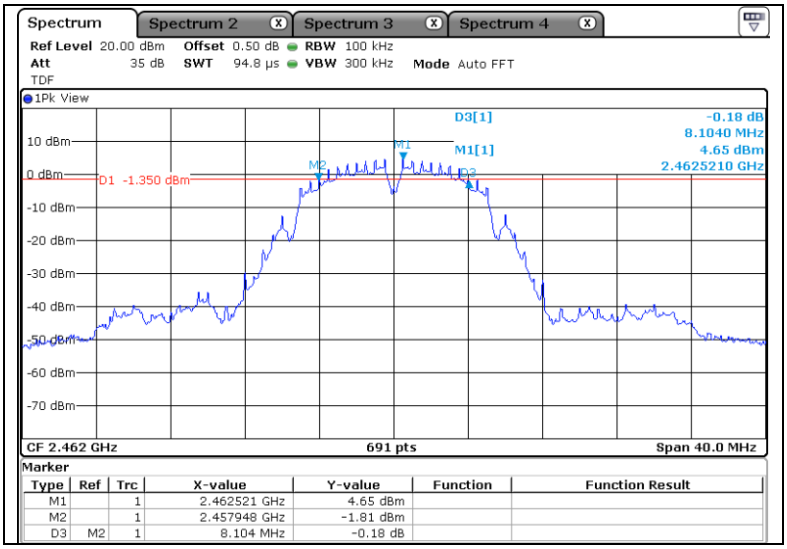
Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)

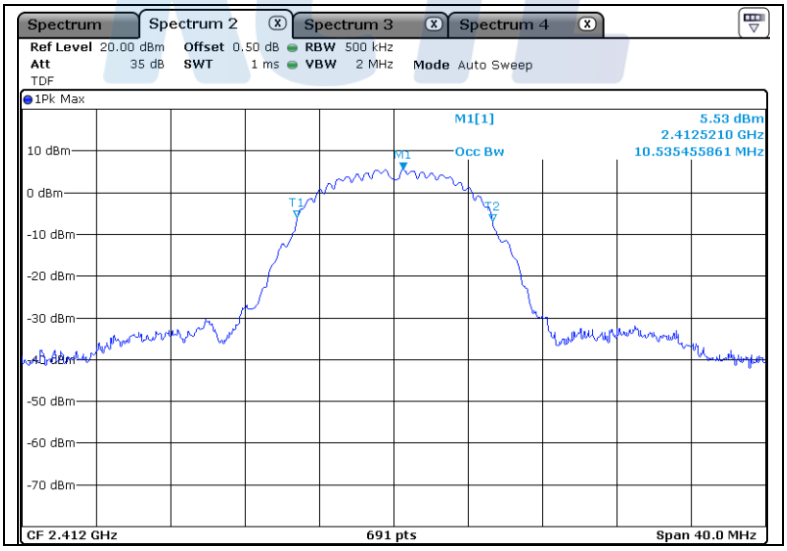


Highest Channel (2 462 ㎒)

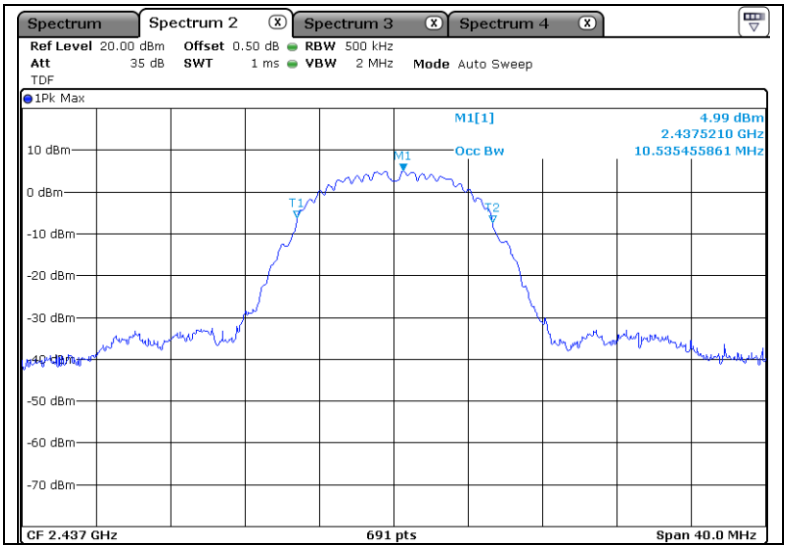


- 802.11b_Occupied Bandwidth

Lowest Channel (2 412 ㎒)



Middle Channel (2 437 ㎒)



Highest Channel (2 462 ㎒)