TEST REPORT

Part 15 Subpart E 15.407

Equipment under test	Digital Flat Panel X-ray Detector
Model name	PEDRA-1417MC
Variant Model name	PEDRA-1417MG, DET14-MCD1, DET14-MGD1
FCC ID	2AXRZPEDRA-1417M
Applicant	RADISEN CO., LTD
Manufacturer	RADISEN CO., LTD
Factory	RADISEN CO., LTD / Marketech International Corp.
Date of test(s)	2020.09.21. ~ 2020.10.07
Date of issue	2020.10.07

Issued to

RADISEN CO., LTD

14F Gongduk B/D, 11, Saechang-ro, Mapo-gu,
Seoul, 04168,Republic of Korea
Tel: +82-31-8084-9762 / Fax: +82-31-8084-9763

Issued by

KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,
Gyeonggi-do, 14057, Korea
473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Test and report completed by :	**Report approval by :**
Young-Jun, Cho Test engineer	Young-Jin, Lee Technical manager

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Revision history

Revision	Date of issue	Test report No.	Description
-	2020.10.07	KES-RF1-20T0188	Initial

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1. General information

Applicant:	RADISEN CO., LTD
Applicant address:	14F Gongduk B/D, 11, Saechang-ro, Mapo-gu, Seoul, 04168,Republic of Korea
Factory 1:	RADISEN CO., LTD
Factory 1 address:	B/602ho, Beolmal-ro, Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea
Factory 2:	Marketech International Corp.
Factory 2 address:	No. 35, Guangfu S. Rd., Hukou Township, Hsinchu County 30351, Taiwan
Test site:	KES Co., Ltd.
Test site address:	3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea 473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
Test Facility	FCC Accreditation Designation No.: KR0100, Registration No.: 444148
FCC rule part(s):	15.407
FCC ID:	2AXRZPEDRA-1417M
Test device serial No.:	☒ Production ☐ Pre-production ☐ Engineering

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1.1. EUT description

Equipment under test	Digital Flat Panel X-ray Detector	
Frequency range &		2 412 ㎒ ~ 2 462 ㎒ (802.11b/g/n_HT20) : 11 ch
Number of channels		2 422 ㎒ ~ 2 452 ㎒ (802.11n_HT40) : 7 ch
	UNII-1	**5 180 ㎒ ~ 5 240 ㎒ (802.11a/n_HT20) : 4 ch**
		5 190 ㎒ ~ 5 230 ㎒ (802.11n_HT40) : 2 ch
		5 210 ㎒ (802.11ac_VHT80) : 1 ch
	UNII-3	**5 745 ㎒ ~ 5 825 ㎒ (802.11a/n_HT20) : 5 ch**
		5 755 ㎒ ~ 5 795 ㎒ (802.11n_HT40) : 2 ch
		5 775 ㎒ (802.11ac_VHT80) : 1 ch
Model:	PEDRA-1417MC	
Variant Model name	PEDRA-1417MG, DET14-MCD1, DET14-MGD1	
Modulation technique	WIFI : DSSS, OFDM	
Antenna specification		
ANT0	2.4 ㎓ Antenna type : PCB antenna,	Peak gain : 1.9 ㏈i
ANT1	2.4 ㎓ Antenna type : PCB antenna,	Peak gain : -1.6 ㏈i
ANT0	5 ㎓ Antenna type : : PCB antenna,	Peak gain(UNII-1) : -1.8 ㏈i
		Peak gain(UNII-3) : -2.9 ㏈i
ANT1	5 ㎓ Antenna type : : PCB antenna,	Peak gain(UNII-1) : -1.1 ㏈i
		Peak gain(UNII-3) : -2.0 ㏈i
Power source	AC 120 V (AC/DC adaptor output 15 V)	
H/W version	1.1.0	
S/W version	1.0.x.x	

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1.2. Test configuration

The **RADISEN CO., LTD // PEDRA-1417MC // FCC ID: 2AXRZPEDRA-1417M** was tested per the guidance of KDB 789033 D02 v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

1.3. Device modifications

N/A

1.4. Frequency/channel operations

UNII-1

Ch.	Frequency (MHz)
36	5 180
38	5 200
44	5 220
48	5 240

UNII-3

Ch.	Frequency (MHz)
149	5 745
. .	. .
157	5 785
. .	. .
165	5 825

Table 1.4-1. 802.11a/n_HT20 mode

UNII-1

Ch.	Frequency (MHz)
38	5 190
46	5 230

UNII-3

Ch.	Frequency (MHz)
151	5 755
159	5 795

Table 1.4-2. 802.11n_HT40 mode

UNII-1

Ch.	Frequency (MHz)
42	5 210

UNII-3

Ch.	Frequency (MHz)
155	5 775

Table 1.4-3. 802.11ac_VHT80 mode

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1.5. Maximum average output power

Refer to the average output power.

Note.

1. Radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.
2. Worst-case data rates as provided by the client were:
   802.11a : **6.0 Mbps**
   802.11n_HT 20 : **7.2 Mbps**
   802.11n_HT 40 : **15.0 Mbps**
   802.11ac_VHT 80 : **65.0 Mbps**

1.6. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
-	-	-	-	-

1.7. Information about Variant Model name

Model name	Scintillator type
PEDRA-1417MC	CsI:Tl (Direct)
PEDRA-1417MG	GD2O2S:Tb
DET14-MCD1	CsI:Tl (Direct)
DET14-MGD1	GD2O2S:Tb

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1.8. Antenna information

Mode	SISO		MIMO
	Antenna 0	Antenna 1	Antenna 0+1
802.11b	✔	✔	×
802.11g	✔	✔	×
802.11n_HT20	✔	✔	✔
802.11n_HT40	✔	✔	✔
802.11a	✔	✔	×
802.11an_HT20	✔	✔	✔
802.11an_HT40	✔	✔	✔
802.11ac_VHT80	✔	✔	✔

✔ = Support; × = Not support

WiFi Antenna Model :

WIFI DUAL BAND ANTENNA_1 (ANT0), WIFI DUAL BAND ANTENNA_2(ANT1),

Ant0 Gain (dBi)	Ant1 Gain (dBi)	Note
1.9	-1.6	2 412 to 2 462 MHz
-1.8	-1.1	5 180 to 5 240 MHz
-2.9	-2.0	5 745 to 5 825 MHz

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1.9. Measurement results explanation example

For all conducted test items :

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 1.65 + 10 = 11.65 (dB)

1.10. Measurement Uncertainty

Test Item		Uncertainty
Uncertainty for Conduction emission test		2.46 dB
Uncertainty for Radiation emission test (include Fundamental emission)	Below 1㎓	4.40 dB
	Above 1㎓	5.94 dB
Note. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.		

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2. Summary of tests

Reference	Parameter	Test results
15.407(a)	26 ㏈ bandwidth & 99 % Occupied Bandwidth	N/A(Note1)
15.407(a)	Maximum conducted output power	Pass
15.407(a)	Power spectral density	N/A(Note1)
15.407(g)	Frequency stability	N/A(Note1)
15.205 15.209	Radiated restricted band and emission	Pass
15.407(d)	General field strength limit (Restricted bands and radiated emission limit)	Pass
15.207	AC power line conducted emissions	Pass

Note :

1) Please Refer to the approved Module Report (Report No.: RF180828C26A-1) for result of existing test items.

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3. Test results

3.1. Maximum conducted output power

Test procedure

KDB 789033 D02 v02r01– Section E.3.a) or b)
Used test method is Section E.3.b)

Test setup

EUT	—	Attenuator	—	Power meter, Power sensor

Section E.3.a)

Method PM (Measurement using an RF average power meter):

i. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
- The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

ii. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.

iii. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

iv. Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25 %).

v. In case of band crossing channels 138, 142 and 144, the measurement is complied with section E.2.d of KDB 644545_D03 v01

Section E.3.b)

Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

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Limit

Band	EUT Category		Limit
UNII-1		Outdoor access point	1 W (30 dBm)
		Indoor access point	
		Fixed point-to-point access point	
	✓	Mobile and portable client device	250 mW(24 dBm)
UNII-2A			250 mW or 11 dBm + 10logB*
UNII-2C			250 mW or 11 dBm + 10logB*
UNII-3	✓		1 W (30 dBm)

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Test results

Band	mode	Frequency (MHz)	Detector mode	Output power(dBm)		Limit (dBm)
				ANT1	ANT2	
UNII-1	802.11a	5 180	AV	13.78	12.58	24.00
		5 200	AV	12.75	12.98	
		5 240	AV	12.68	12.37	
UNII-3		5 745	AV	12.89	14.52	30.00
		5 785	AV	11.41	14.08	
		5 825	AV	9.04	13.55	

Band	mode	Frequency (MHz)	Detector mode	Output power(dBm)			Limit (dBm)
				ANT1	ANT2	SUM[1]	
UNII-1	802.11n_ HT20	5 180	AV	12.98	11.11	15.16	24.00
		5 200	AV	13.62	12.20	15.98	
		5 240	AV	13.05	12.43	15.76	
UNII-3		5 745	AV	12.78	12.80	15.80	30.00
		5 785	AV	13.35	11.54	15.55	
		5 825	AV	13.66	11.42	15.69	

Band	mode	Frequency (MHz)	Detector mode	Output power(dBm)			Limit (dBm)
				ANT1	ANT2	SUM[1]	
UNII-1	802.11n_ HT40	5 190	AV	10.90	10.30	13.62	24.00
		5 230	AV	11.04	10.33	13.71	
UNII-3		5 755	AV	12.71	9.82	14.51	30.00
		5 795	AV	12.60	10.29	14.61	

Band	mode	Frequency (MHz)	Detector mode	Output power(dBm)			Limit (dBm)
				ANT1	ANT2	SUM[1]	
UNII-1	802.11ac_ VHT80	5 210	AV	8.92	7.60	11.32	24.00
UNII-3		5 775	AV	9.93	6.52	11.56	30.00

Note.

1. Sum = 10log($10^{Ant0/10} + 10^{Ant1/10} \ldots 10^{Ant\,N/10}$)

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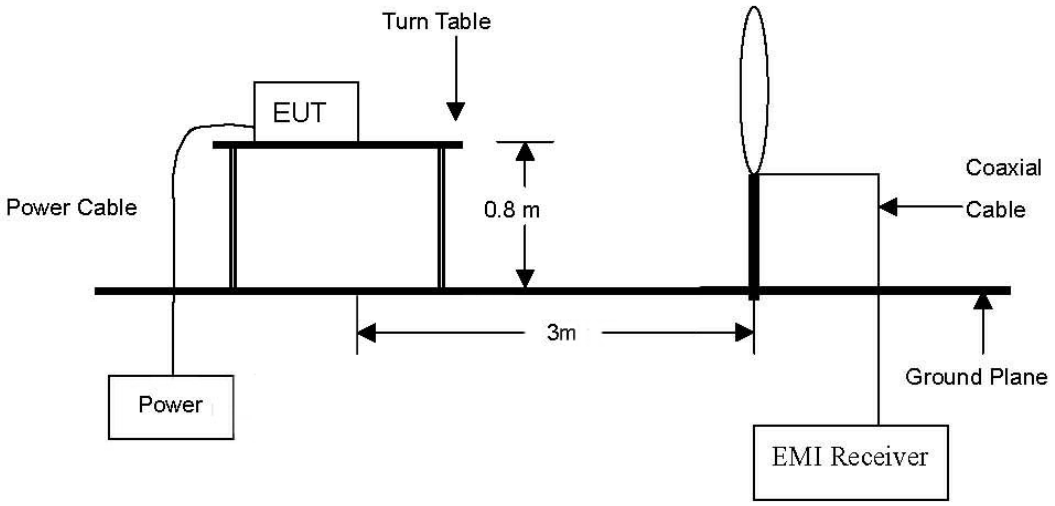
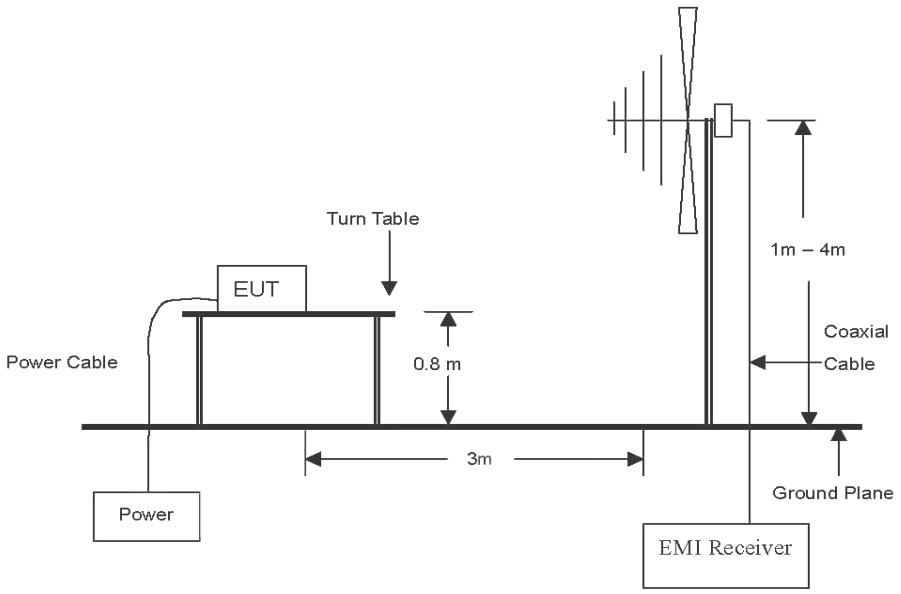
3.2. Radiated restricted band and emissions

Test setup

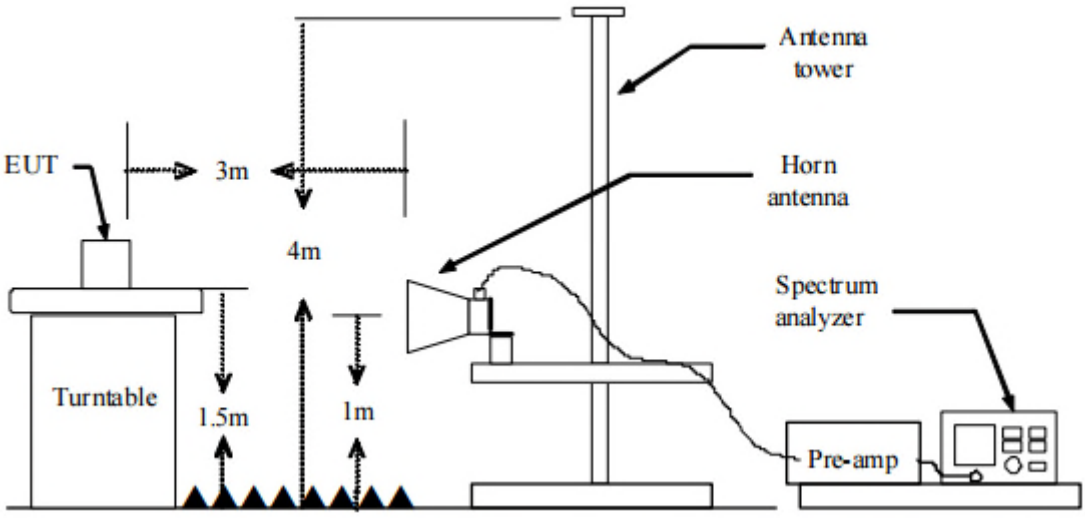
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



Test procedure below 30 ㎒

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
4. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum hold mode.

Test procedure above 30 ㎒

1. Spectrum analyzer settings for f < 1 ㎓:
   ① Span = wide enough to fully capture the emission being measured
   ② RBW = 120 ㎑
   ③ VBW ≥ RBW
   ④ Detector = quasi peak
   ⑤ Sweep time = auto
   ⑥ Trace = max hold
2. Spectrum analyzer settings for f ≥1 ㎓: Peak
   ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
   ② RBW = 1 ㎒
   ③ VBW = 3 ㎒ (≥ 3 x RBW)
   ④ Detector = peak
   ⑤ Sweep time = auto
   ⑥ Trace = max hold
   ⑦ Trace was allowed to stabilize

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3. Spectrum analyzer settings for f ≥1 ㎓: Average
   ① Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
   ② RBW = 1 ㎒
   ③ VBW ≥ 3 × RBW
   ④ Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
   ⑤ Averaging type = power(i.e., RMS)
      1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
      2) Some instruments require linear display mode in order to use linear voltage averaging. Log or ㏈ averaging shall not be used.
   ⑥ Sweep = auto
   ⑦ Trace = max hold
   ⑧ Perform a trace average of at least 100 traces.
   ⑨ A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

      1) If power averaging (RMS) mode was used in step ⑤, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.
      2) If linear voltage averaging mode was used in step ⑤, then the applicable correction factor is 20 log(1/x), where x is the duty cycle.
      3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Note.

1. f <30 ㎒, extrapolation factor of 40 ㏈/decade of distance. $F_d = 40\log(D_m/Ds)$
   f ≥30 ㎒, extrapolation factor of 20 ㏈/decade of distance. $F_d = 20\log(D_m/Ds)$
   Where:
   F_d = Distance factor in ㏈
   D_m = Measurement distance in meters
   D_s = Specification distance in meters
2. CF(Correction factors(㏈)) = Antenna factor(㏈/m) + Cable loss(㏈) + or Amp. gain(㏈) + or F_d(㏈)
4. Field strength(㏈㎶/m) = Level(㏈㎶) + CF (㏈) + or DCF(㏈)
5. Margin(㏈) = Limit(㏈㎶/m) - Field strength(㏈㎶/m)
6. Emissions below 18 ㎓ were measured at a 3 meter test distance while emissions above 18 ㎓ were measured at a 1 meter test distance with the application of a distance correction factor.
7. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that **X orientation** was worst-case orientation; therefore, all final radiated testing was performed with the EUT in **X orientation.**
8. The worst-case emissions are reported however emissions whose levels were not within 20 ㏈ of respective limits were not reported.
9. According to exploratory test no any obvious emission were detected from 9 ㎑ to 30 ㎒. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field 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.

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Limit

According to 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (㎒)	Distance (Meters)	Radiated (㎶/m)
0.009 ~ 0.490	300	2400/F(㎑)
0.490 ~ 1.705	30	24000/F(㎑)
1.705 ~ 30.0	30	30
30 ~ 88	3	100**
88 ~ 216	3	150**
216 ~ 960	3	200**
Above 960	3	500

**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 permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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According to 15.407(b), (b) Undesirable emission limits: Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15–5.25 ㎓ band: all emissions outside of the 5.15–5.35 ㎓ band shall not exceed an e.i.r.p of –27 ㏈m/㎒.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(4) For transmitters operating in the 5.725-5.85 GHz band:
i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 ㎒.
A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 ㎒.
(6) Unwanted emissions below 1 ㎓ must comply with the general field strength limits set forth in § 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.
(7) The provisions of §15.205 apply to intentional radiators operating under this section.
(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

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Duty cycle

Regarding to KDB 789033 D02 v02r01, B)2)b), the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below.

Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100.

For the band 5.15-5.25 ㎓

Test mode	T_{on} time (㎳)	Period (㎳)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (㏈)
802.11a	10	10	1	100	0.00
802.11n_HT20	10	10	1	100	0.00
802.11n_HT40	10	10	1	100	0.00
802.11ac_VHT80	10	10	1	100	0.00

For the band 5.725-5.85 ㎓

Test mode	T_{on} time (㎳)	Period (㎳)	Duty cycle (Linear)	Duty cycle (%)	Duty cycle correction factor (㏈)
802.11a	10	10	1	100	0.00
802.11n_HT20	10	10	1	100	0.00
802.11n_HT40	10	10	1	100	0.00
802.11ac_VHT80	10	10	1	100	0.00

Note:

Duty cycle (Linear) = T_{on} time/Period

DCF(Duty cycle correction factor (㏈)) = 10log(1/duty cycle)

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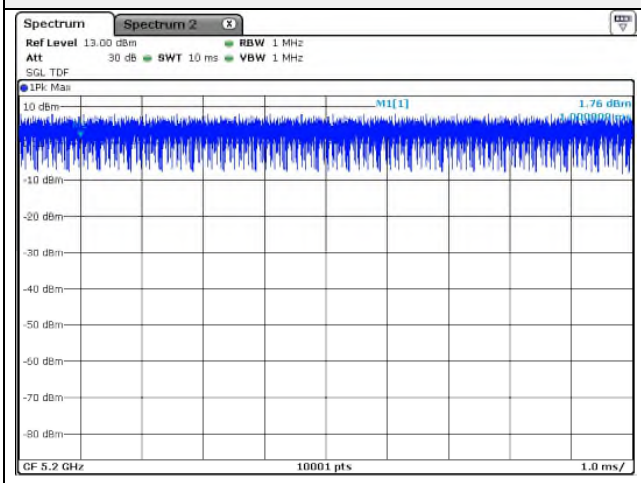
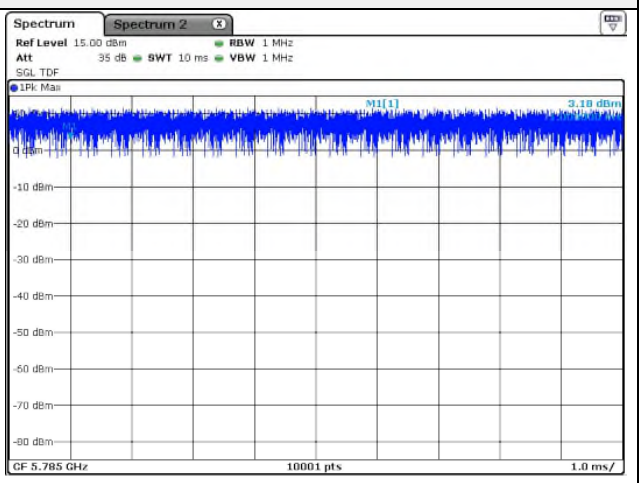
Test plots

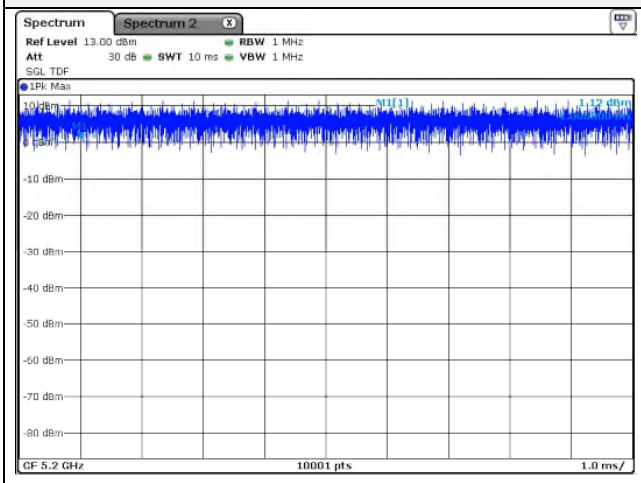
UNII-1_802.11a



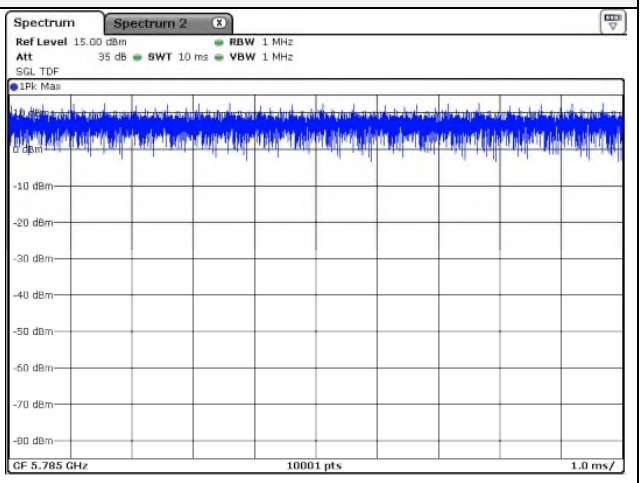
UNII-3_802.11a



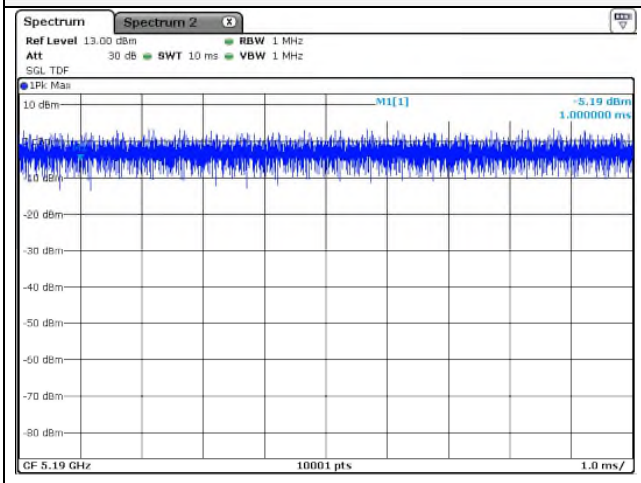
UNII-1_802.11n_HT20



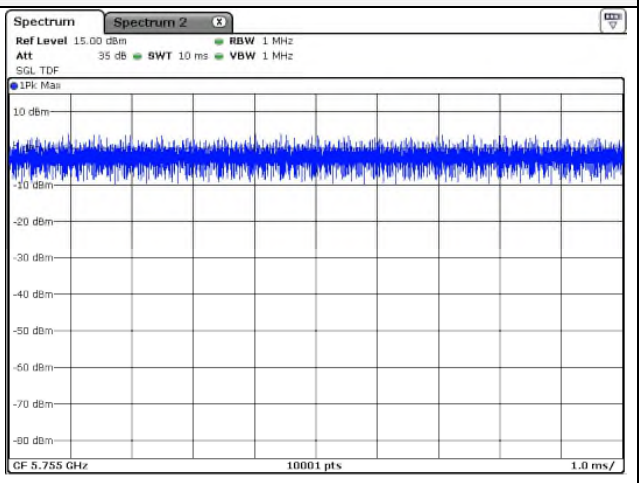
UNII-3_802.11n_HT20



UNII-1_802.11n_HT40



UNII-3_802.11n_HT40



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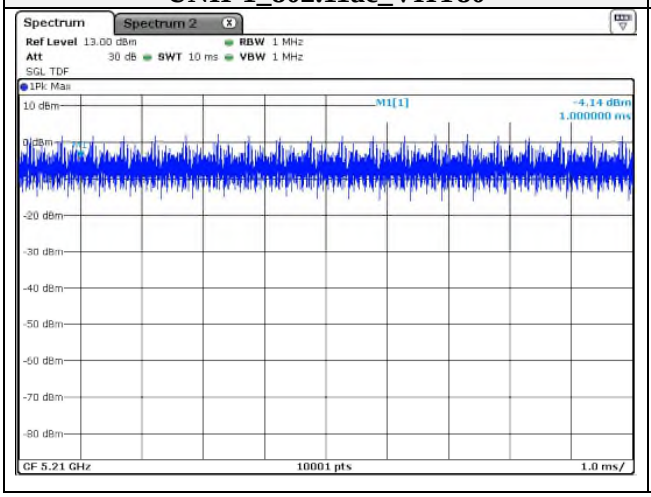
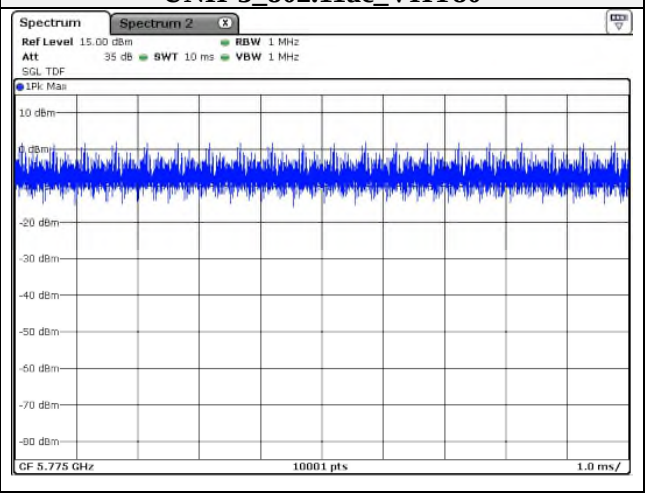
UNII-1_802.11ac_VHT80	UNII-3_802.11ac_VHT80
	

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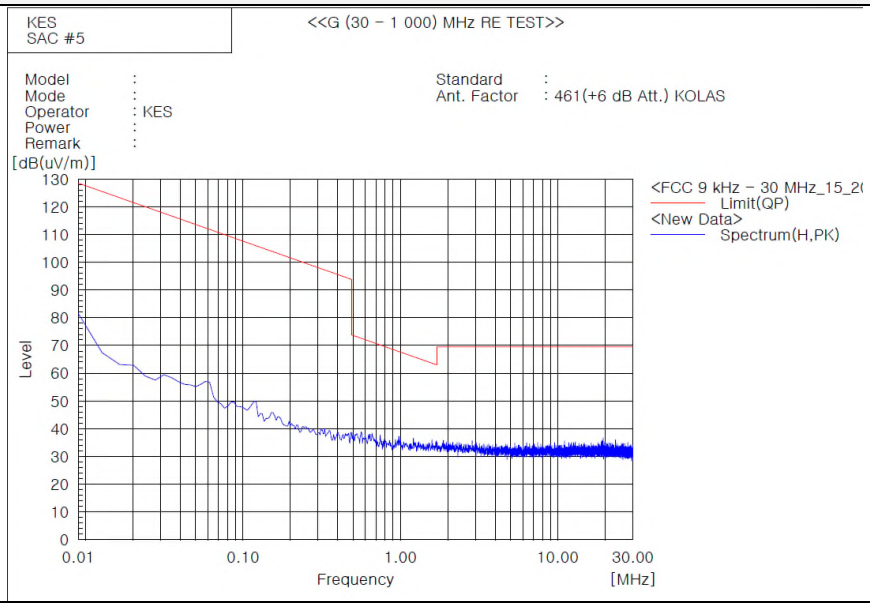
Test results (Below 30 ㎒) – Worst case

Mode:	802.11a
Distance of measurement:	3 meter
Channel:	149 (Worst case)

Horizontal



No spurious emission were detected below 30 ㎒.

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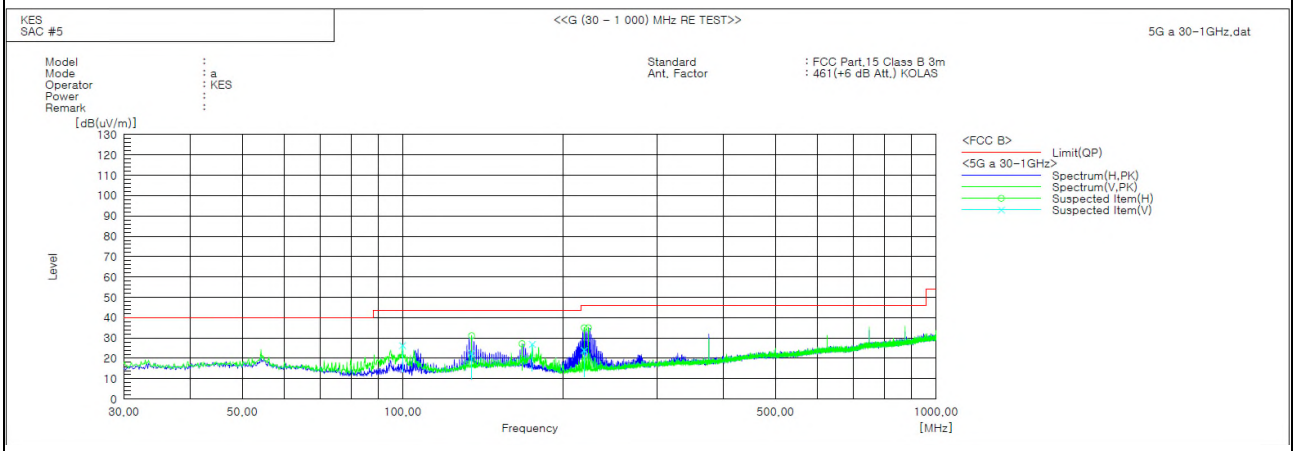
Test results (Below 1 000 ㎒) – Worst case

Mode:	802.11a
Distance of measurement:	3 meter
Channel:	149 (Worst case)

Horizontal // Vertical



Spectrum Selection

No.	Frequency [MHz]	(P)	Reading [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	99.961	V	43.8	-17.5	26.3	43.5	17.2	100.0	205.0	
2	134.639	H	44.7	-13.5	31.2	43.5	12.3	200.0	71.8	
3	134.639	V	36.0	-13.5	22.5	43.5	21.0	400.0	353.9	
4	167.376	H	40.4	-13.2	27.2	43.5	16.3	200.0	358.6	
5	175.015	V	40.6	-13.8	26.8	43.5	16.7	100.0	301.7	
6	219.029	H	50.5	-15.5	35.0	46.0	11.0	200.0	242.3	
7	219.029	V	39.4	-15.5	23.9	46.0	22.1	150.0	144.0	
8	223.151	H	50.4	-15.4	35.0	46.0	11.0	200.0	261.1	

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Test results (Above 1 000 ㎒)

Mode: UNII-1 802.11a

Distance of measurement: 3 meter

Channel: 36

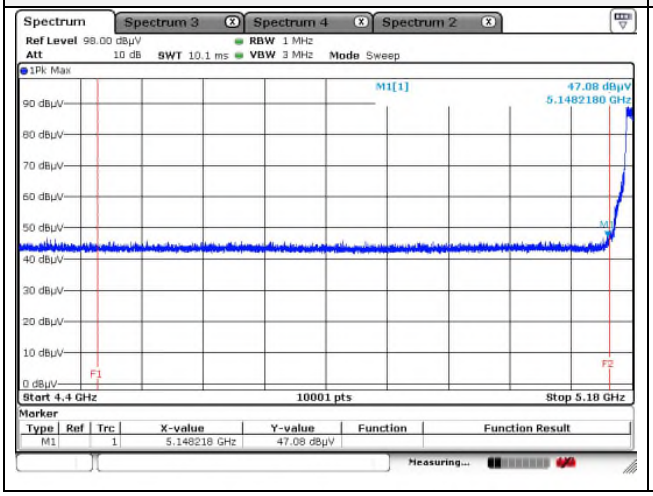
- **Spurious**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1008.25	49.92	Peak	H	-11.32	-	38.60	74.00	35.40
1073.74	48.32	Peak	V	-11.30	-	37.02	74.00	36.98

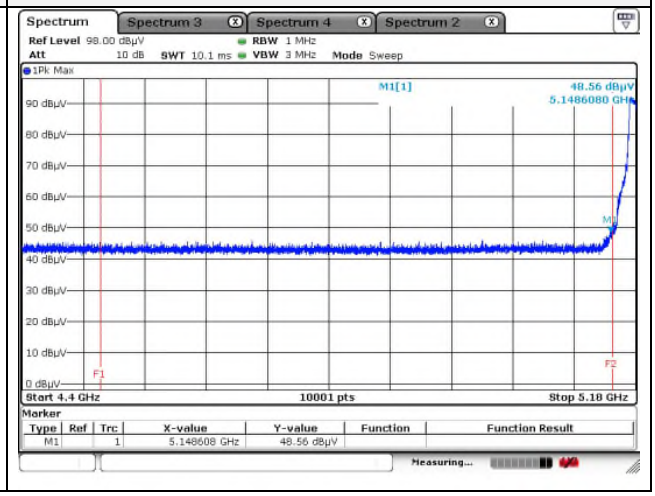
- **Band edge**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5148.22	47.08	Peak	H	4.05	-	51.13	74.00	22.87
5148.61	48.56	Peak	V	4.05	-	52.61	74.00	21.39

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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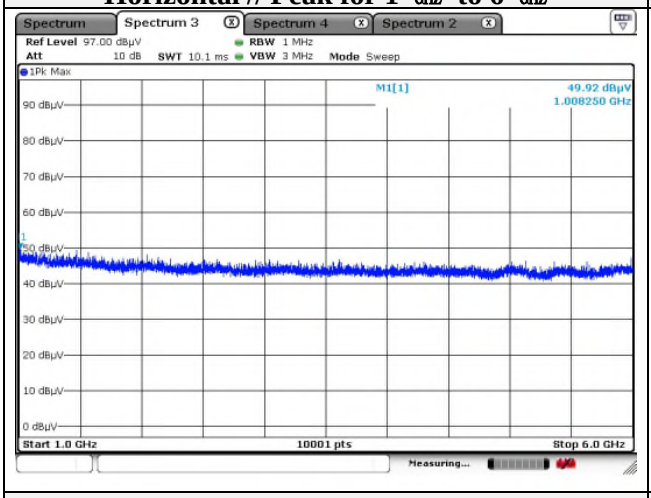
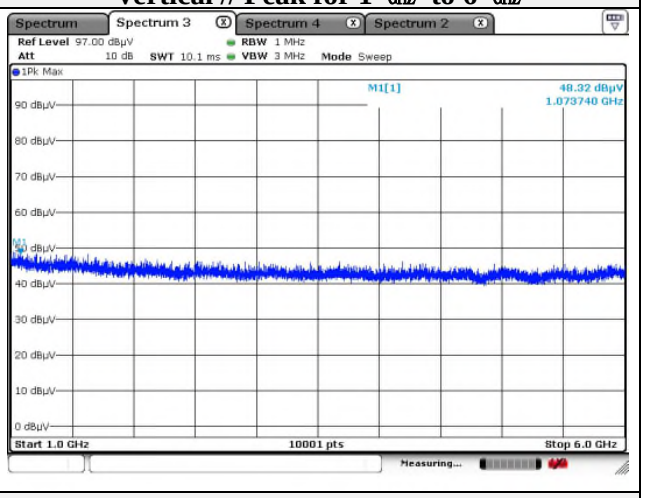
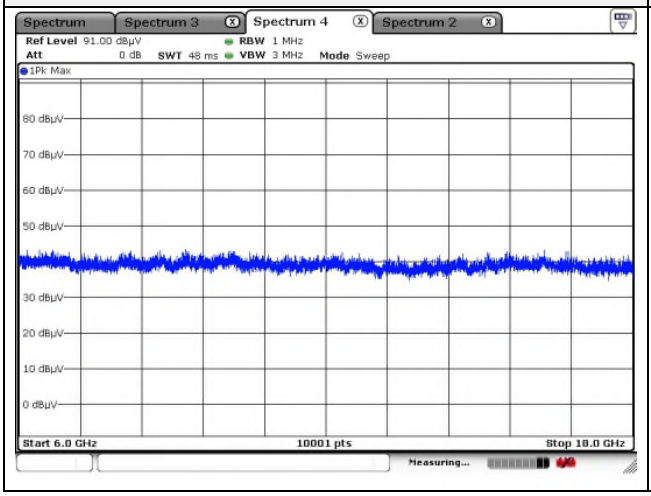
Horizontal // Peak for 1 ㎓ to 6 ㎓



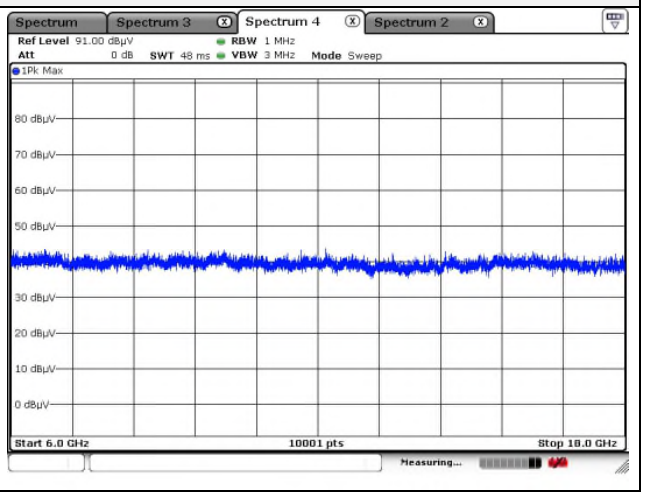
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode: UNII-1 802.11a

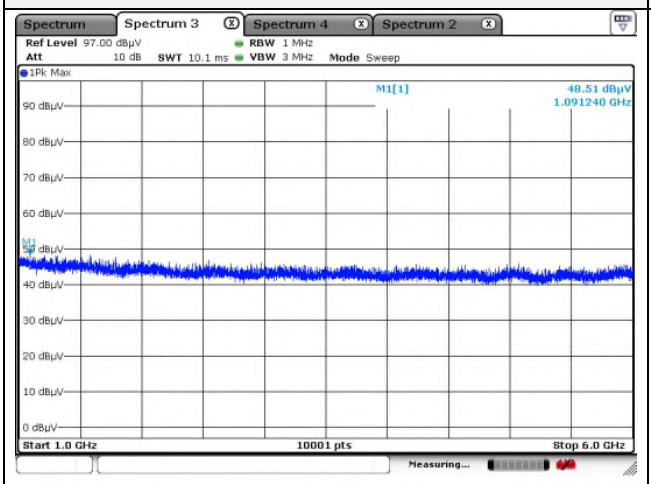
Distance of measurement: 3 meter

Channel: 40

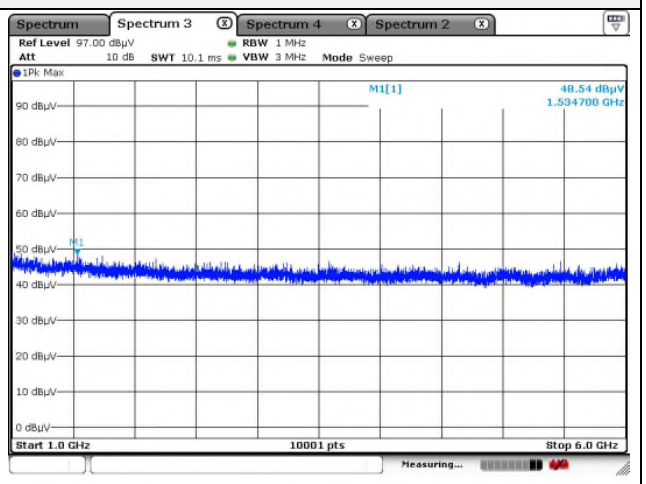
- **Spurious**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1091.24	48.51	Peak	H	-11.29	-	37.22	74.00	36.78
1534.70	48.54	Peak	V	-8.52	-	40.02	74.00	33.98

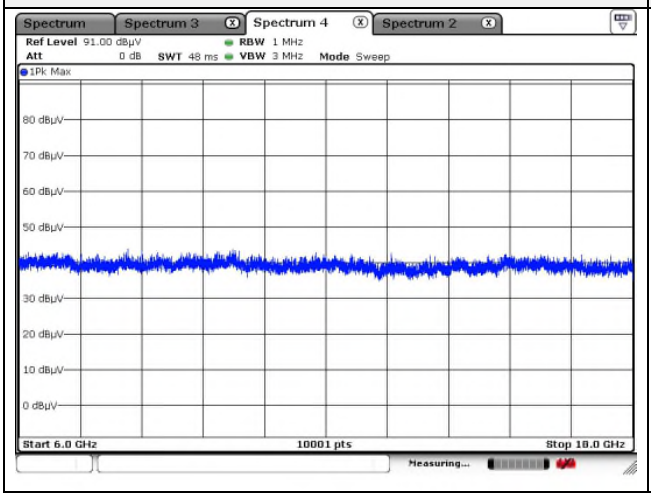
Horizontal // Peak for 1 ㎓ to 6 ㎓



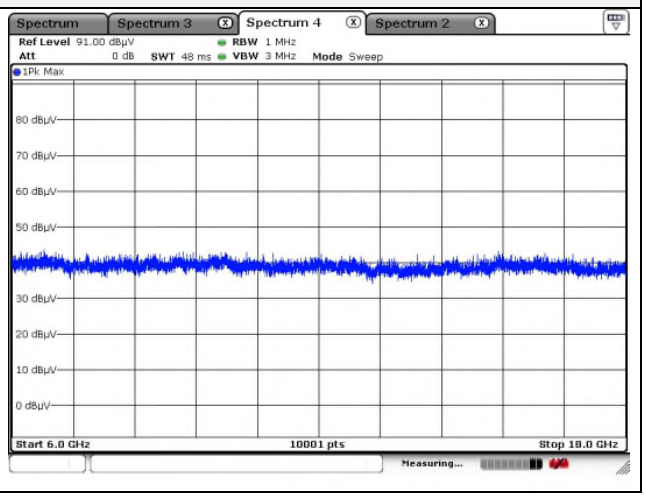
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-1 802.11a

Distance of measurement: 3 meter

Channel: 48

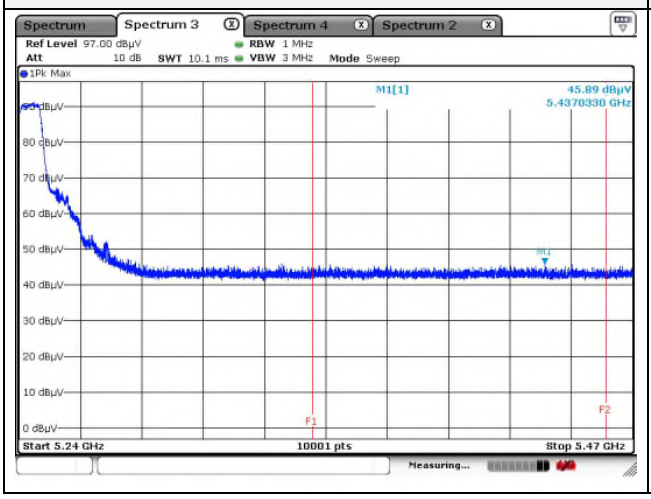
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1016.75	49.18	Peak	H	-11.31	-	37.87	74.00	36.13
1501.70	48.97	Peak	V	-9.03	-	39.94	74.00	34.06

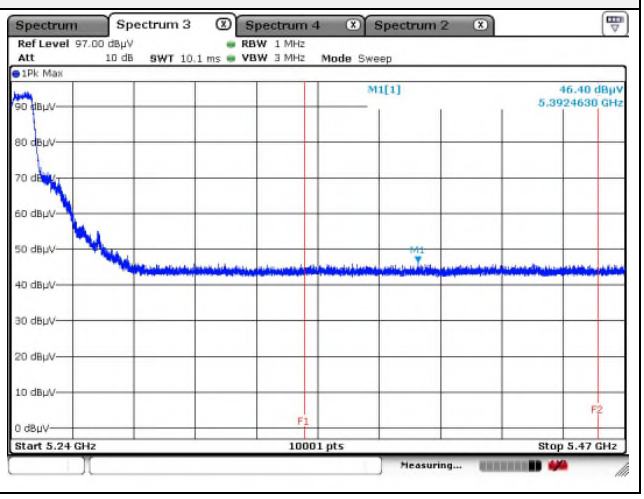
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5437.03	45.89	Peak	H	2.80	-	48.69	74.00	25.31
5392.46	46.40	Peak	V	2.99	-	49.39	74.00	24.61

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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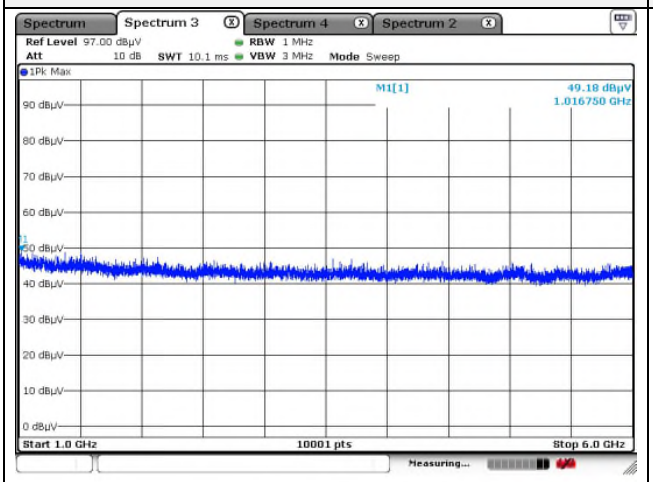
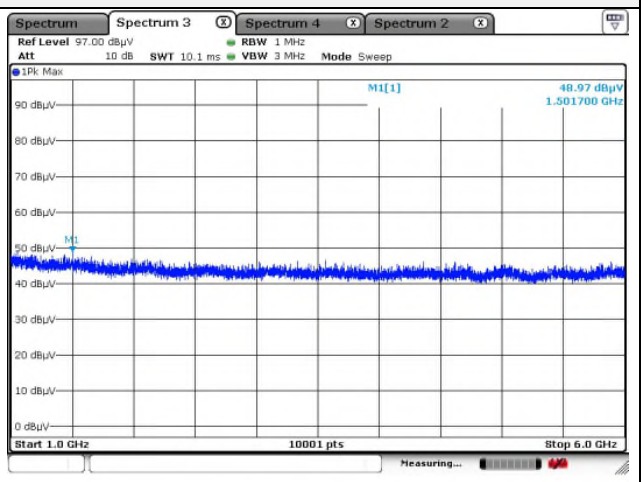
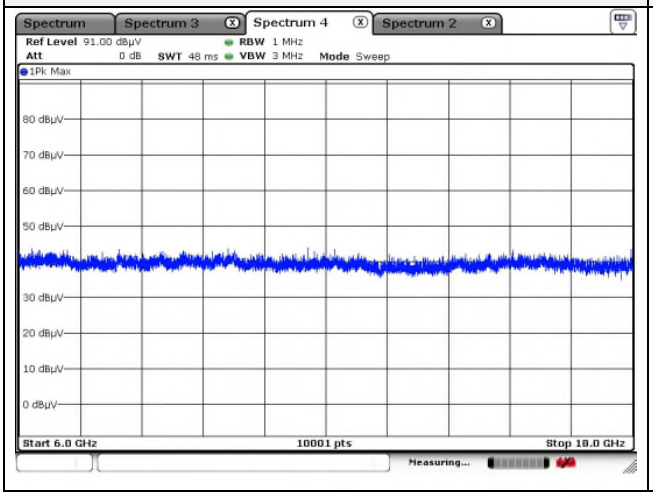
Horizontal // Peak for 1 ㎓ to 6 ㎓



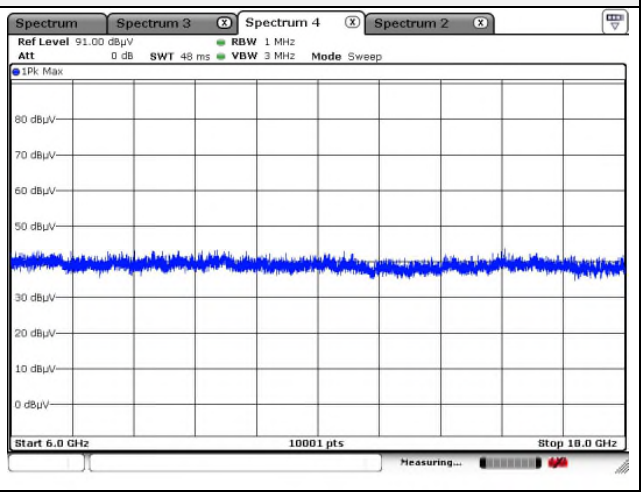
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-1 802.11n_HT20

Distance of measurement: 3 meter

Channel: 36

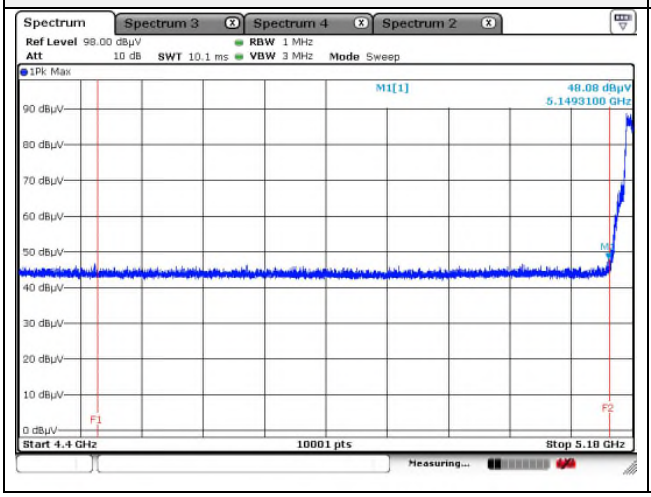
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1089.24	48.87	Peak	H	-11.29	-	37.58	74.00	36.42
1500.70	48.93	Peak	V	-9.05	-	39.88	74.00	34.12

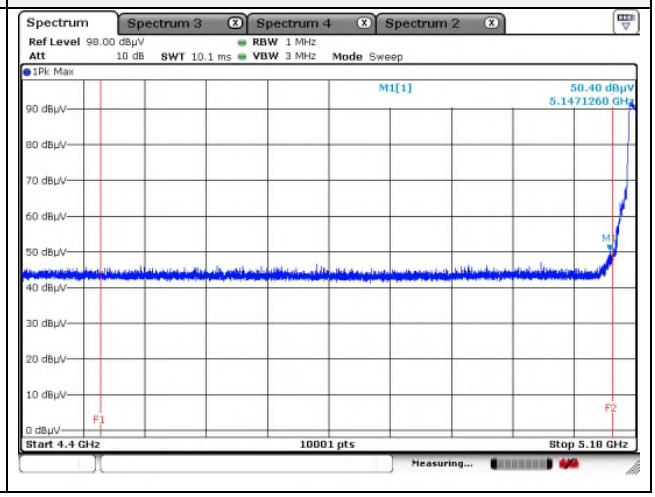
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5149.31	48.08	Peak	H	4.04	-	52.12	74.00	21.88
5147.13	50.40	Peak	V	4.06	-	54.46	74.00	19.54
5147.13	36.42	Average	V	4.06	-	40.48	54.00	13.52

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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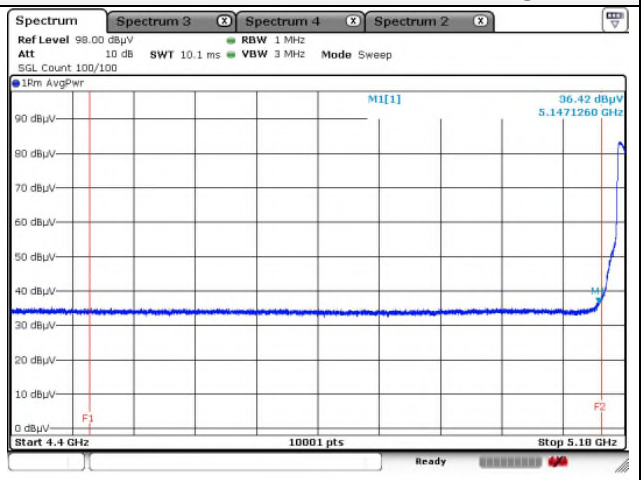
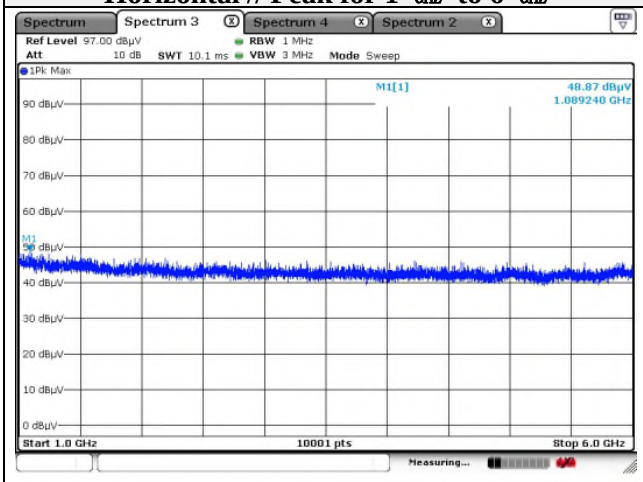
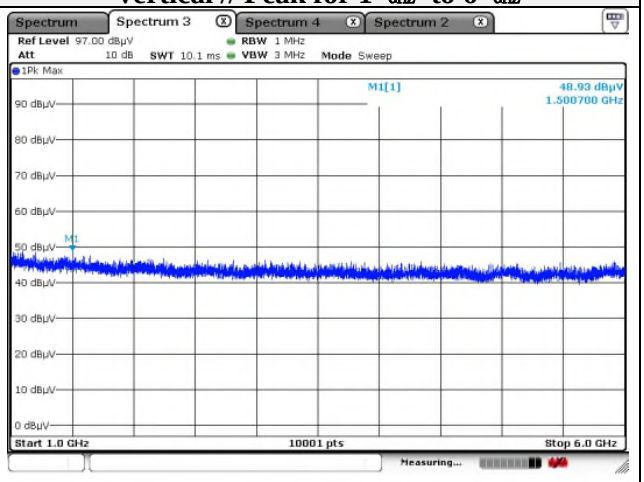
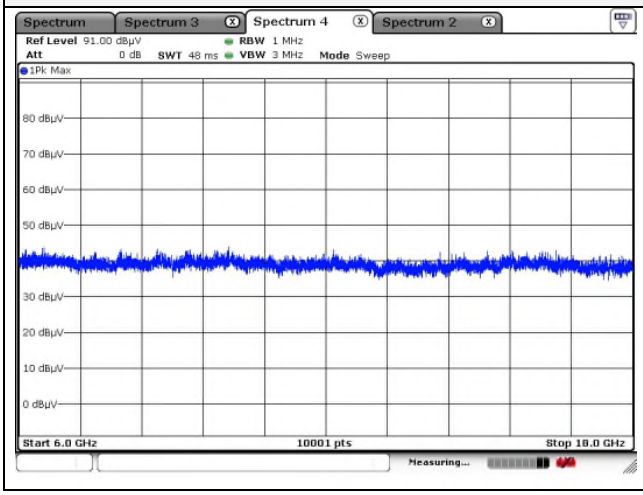
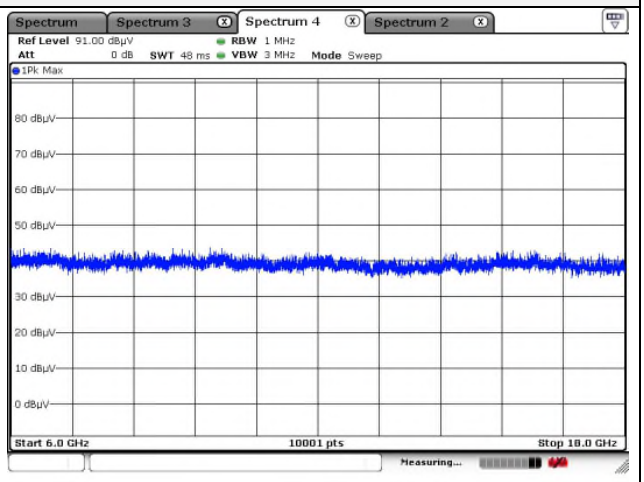
Restricted band // Horizontal // Average	Restricted band // Vertical // Average
N/A	

Horizontal // Peak for 1 ㎓ to 6 ㎓	Vertical // Peak for 1 ㎓ to 6 ㎓
	

Horizontal // Peak for 6 ㎓ to 18 ㎓	Vertical // Peak for 6 ㎓ to 18 ㎓
	

Note.
1. No spurious emission were detected above 6 ㎓.

Mode: UNII-1 802.11n_HT20

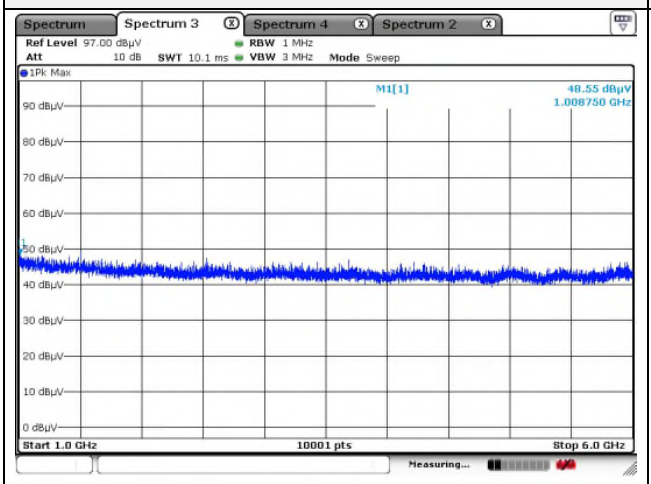
Distance of measurement: 3 meter

Channel: 40

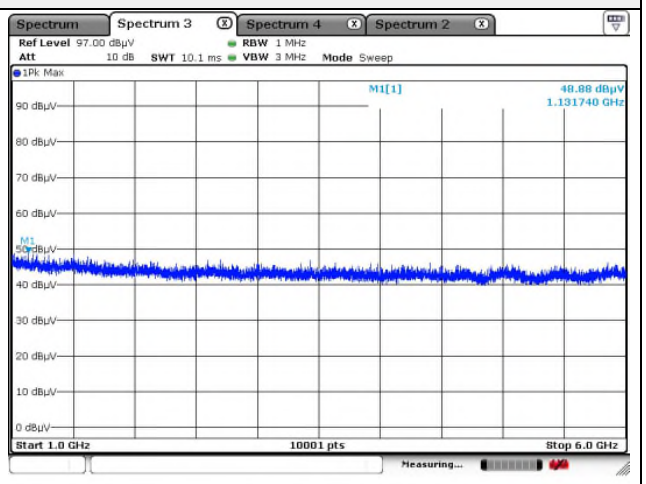
- **Spurious**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1008.75	48.55	Peak	H	-11.32	-	37.23	74.00	36.77
1131.74	48.88	Peak	V	-11.27	-	37.61	74.00	36.39

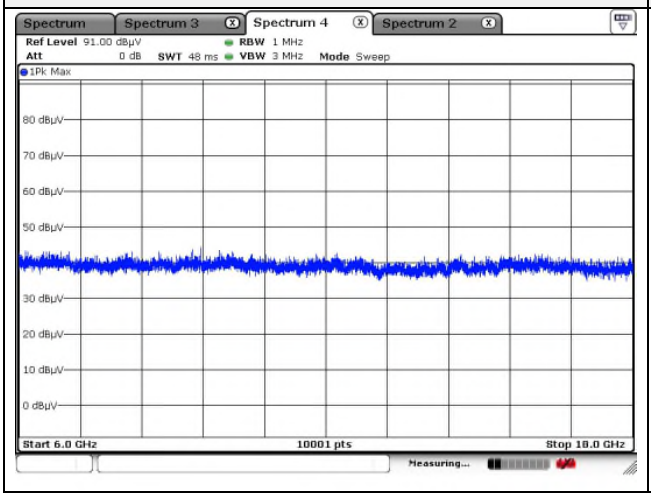
Horizontal // Peak for 1 ㎓ to 6 ㎓



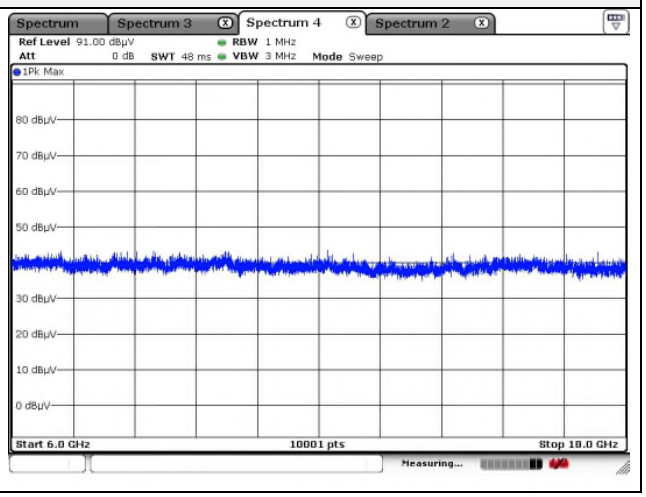
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-1 802.11n_HT20

Distance of measurement: 3 meter

Channel: 48

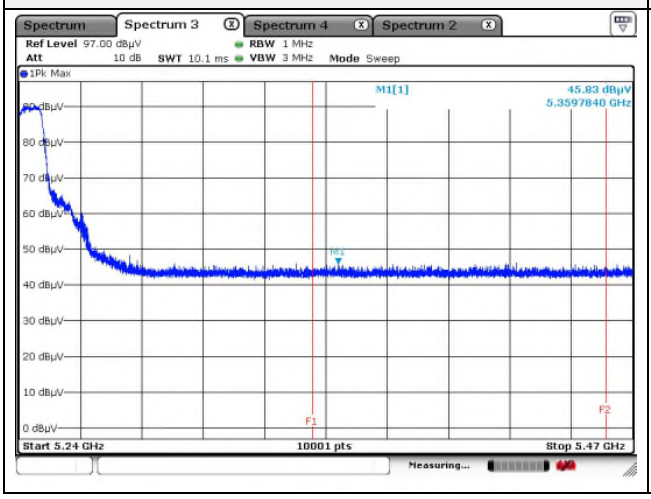
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1125.24	48.35	Peak	H	-11.27	-	37.08	74.00	36.92
1046.25	48.88	Peak	V	-11.31	-	37.57	74.00	36.43

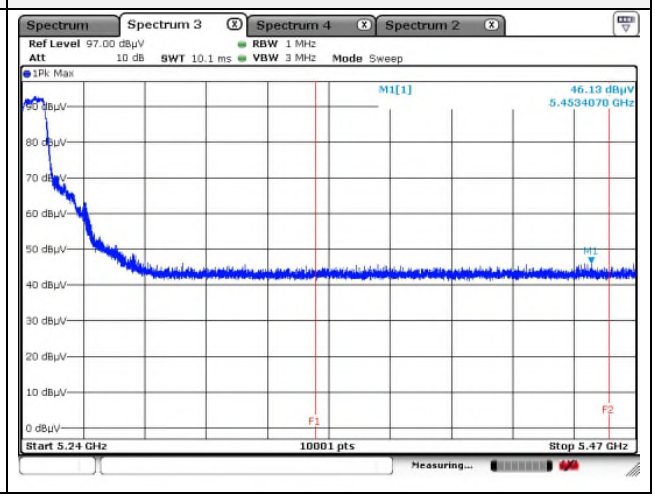
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5359.78	45.83	Peak	H	3.12	-	48.95	74.00	25.05
5453.41	46.13	Peak	V	2.72	-	48.85	74.00	25.15

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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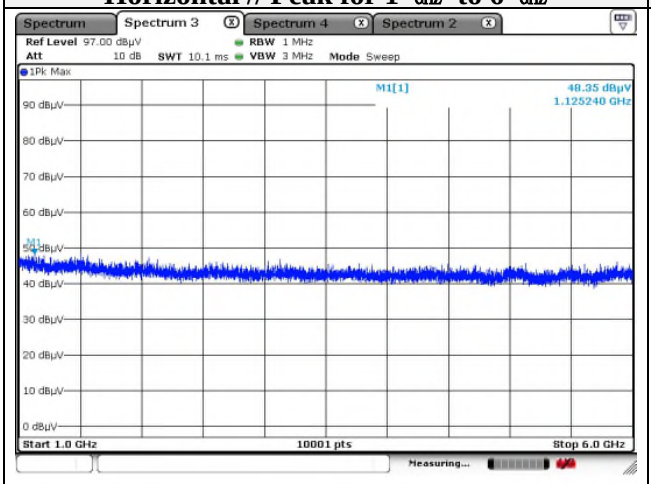
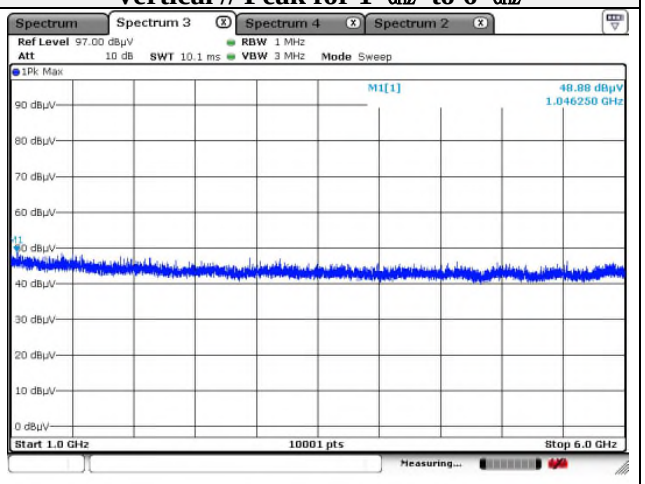
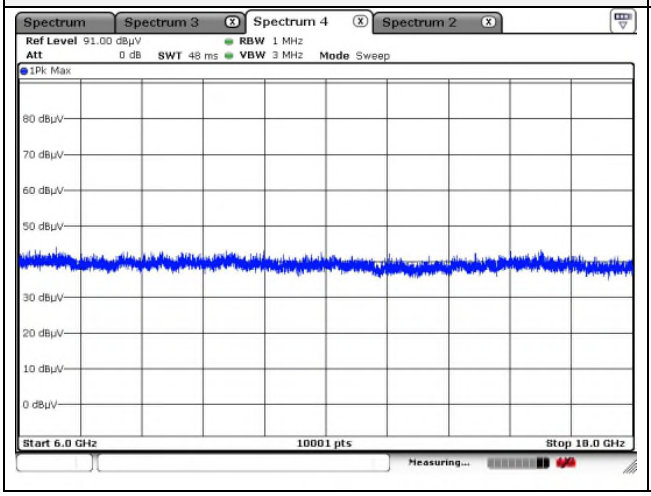
Horizontal // Peak for 1 ㎓ to 6 ㎓



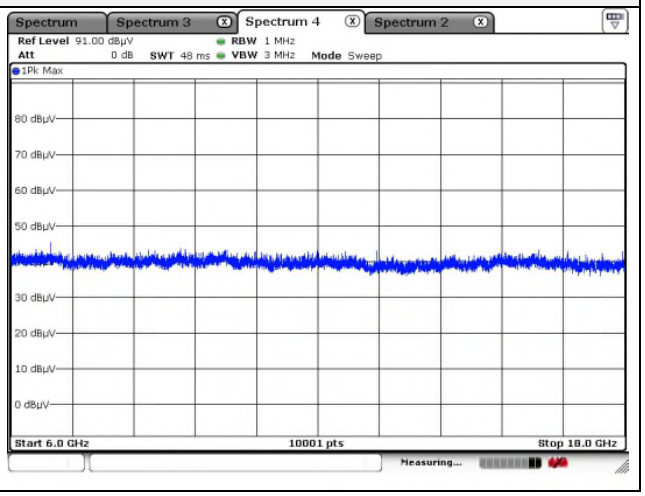
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode: UNII-1 802.11n_HT40

Distance of measurement: 3 meter

Channel: 38

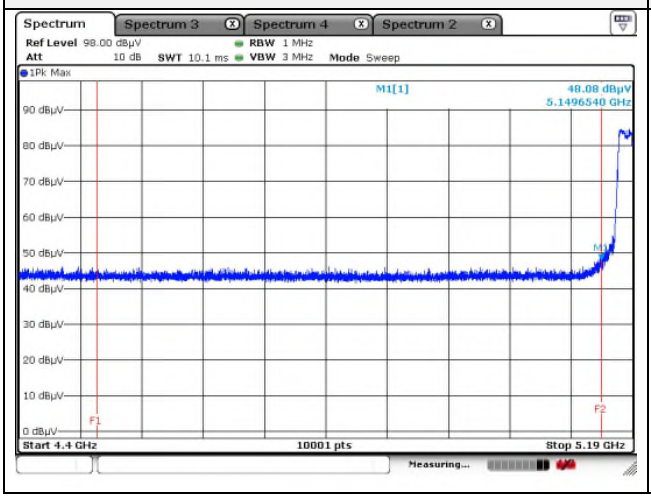
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1091.24	48.55	Peak	H	-11.29	-	37.26	74.00	36.74
1000.25	48.70	Peak	V	-11.32		37.38	74.00	36.62

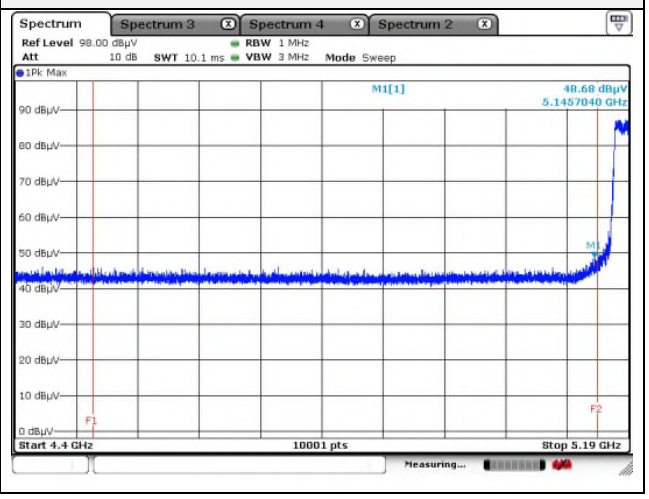
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5149.65	48.08	Peak	H	4.04	-	52.12	74.00	21.88
5145.70	48.68	Peak	V	4.07	-	52.75	74.00	21.25

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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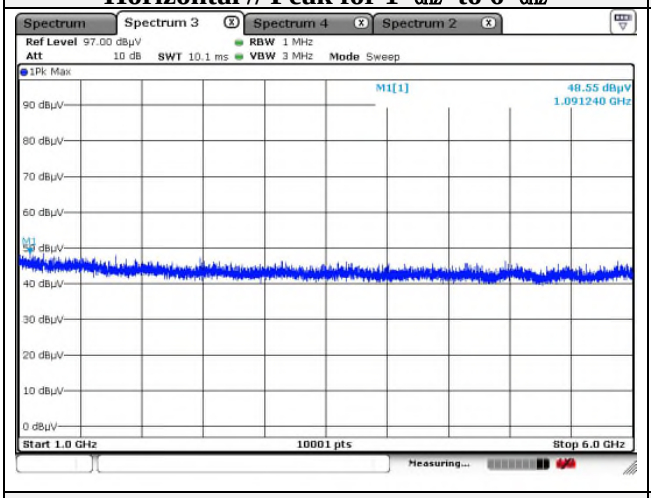
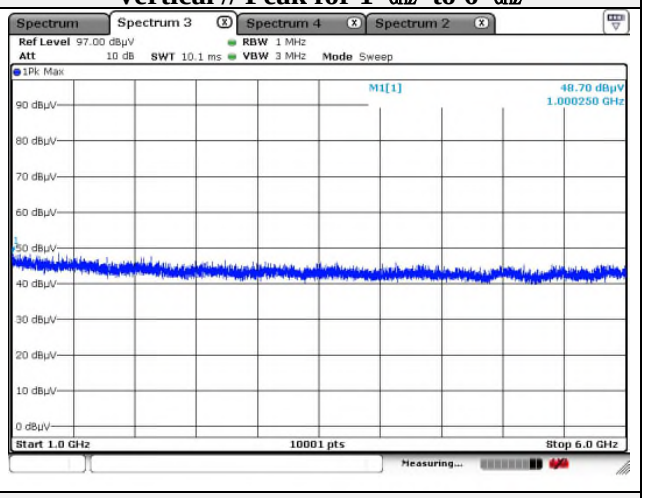
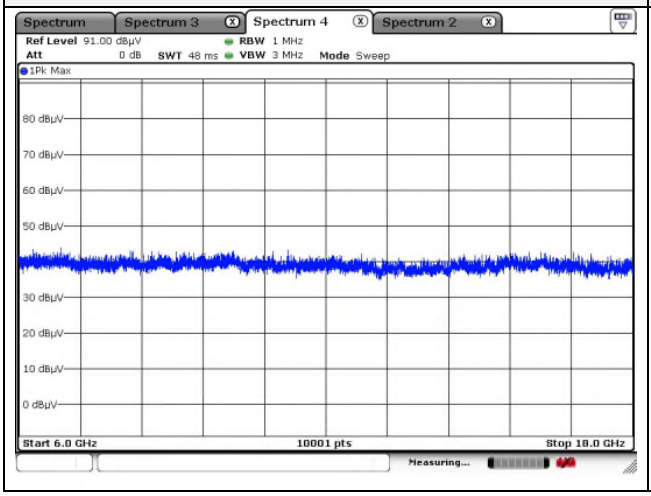
Horizontal // Peak for 1 ㎓ to 6 ㎓



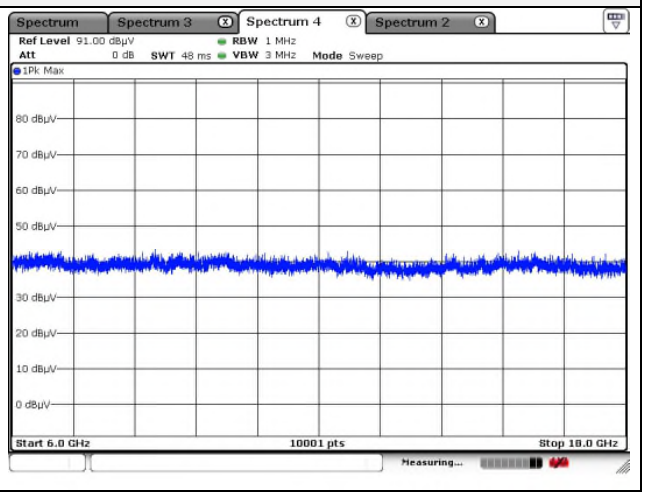
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode: UNII-1 802.11n_HT40

Distance of measurement: 3 meter

Channel: 46

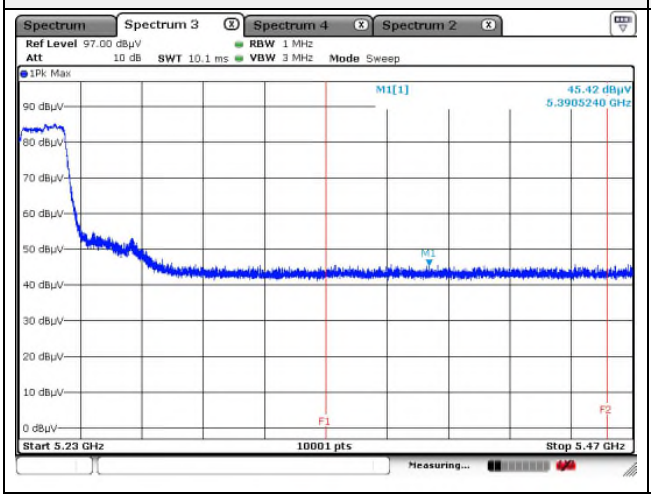
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1000.25	48.16	Peak	H	-11.32	-	36.84	74.00	37.16
1105.24	48.28	Peak	V	-11.28	-	37.00	74.00	37.00

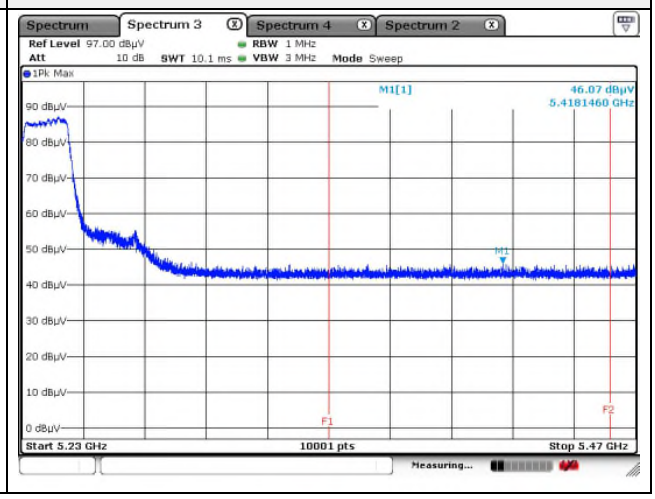
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5390.52	45.42	Peak	H	3.00	-	48.42	74.00	25.58
5418.15	46.07	Peak	V	2.89	-	48.96	74.00	25.04

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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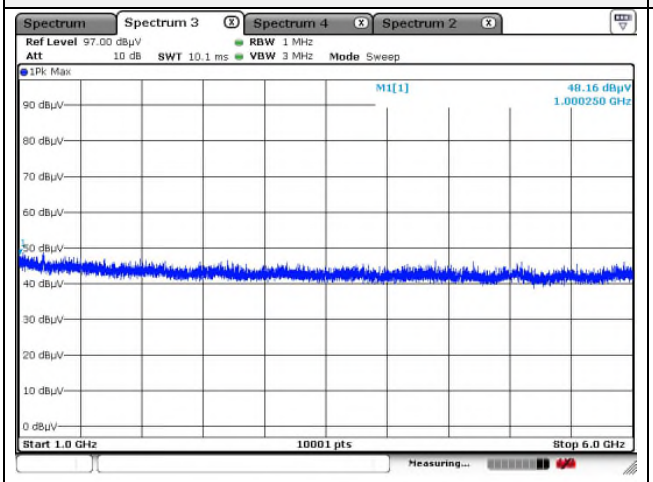
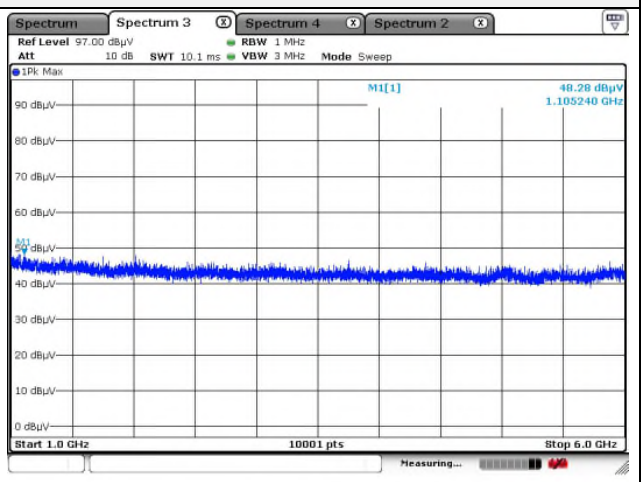
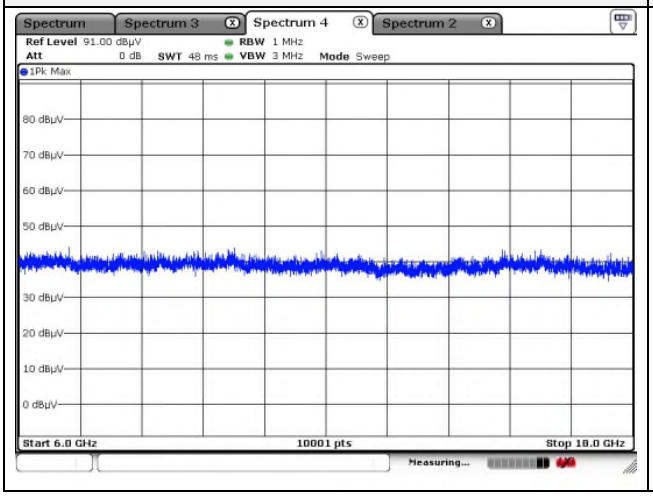
Horizontal // Peak for 1 ㎓ to 6 ㎓



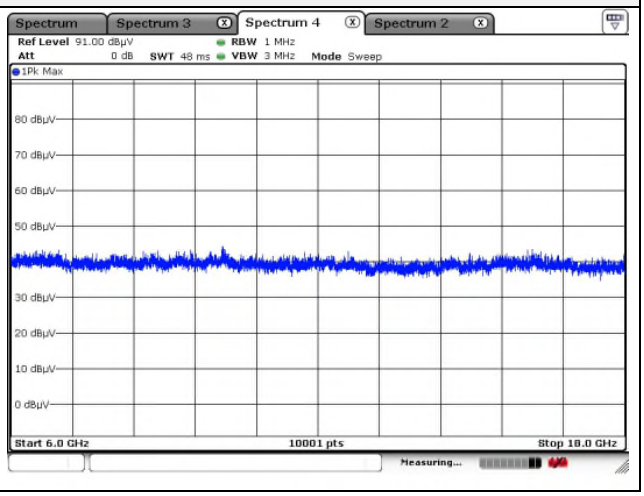
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode:	UNII-1 802.11ac_HT80
Distance of measurement:	3 meter
Channel:	42

- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1055.24	48.90	Peak	H	-11.30	-	37.60	74.00	36.40
1342.22	48.88	Peak	V	-11.20		37.68	74.00	36.32

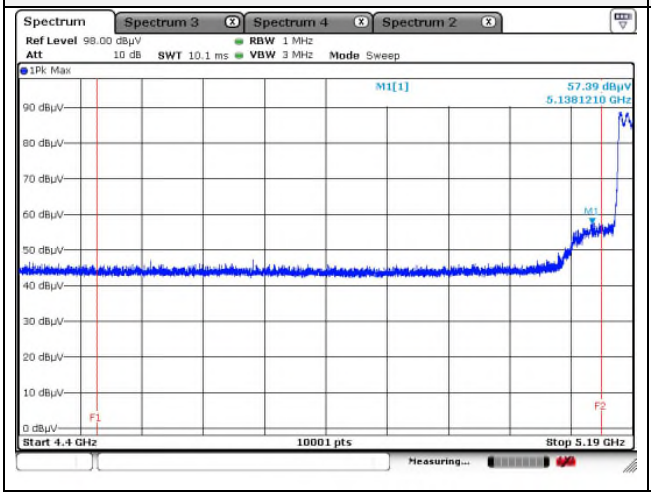
- **Band edge // Below**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5138.12	57.39	Peak	H	4.11	-	61.50	74.00	12.50
5138.12	45.14	Average	H	4.11	-	49.25	54.00	4.75
5134.17	51.41	Peak	V	4.14	-	55.55	74.00	18.45
5134.17	36.34	Average	V	4.14	-	40.48	54.00	13.52
5146.75	52.05	Peak	V	4.07	-	56.12	74.00	17.88
5146.75	36.67	Average	V	4.07	-	40.74	54.00	13.26

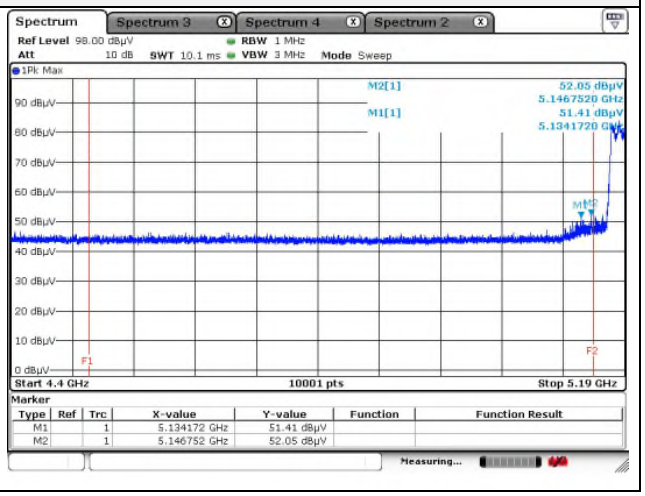
- **Band edge // Above**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5353.71	46.87	Peak	H	3.14	-	50.01	74.00	23.99
5363.43	46.89	Peak	V	3.11	-	50.00	74.00	24.00

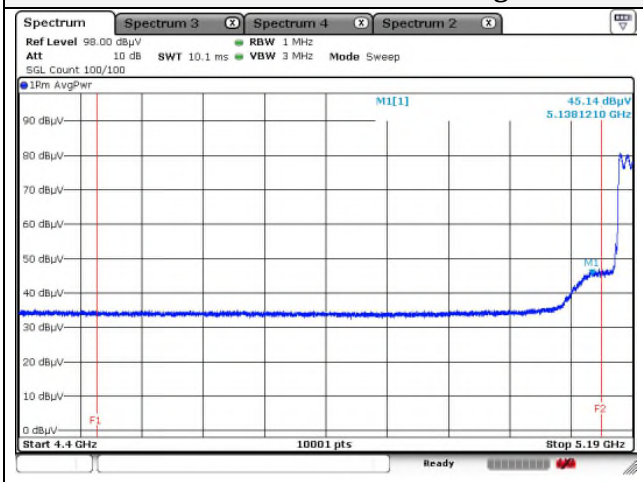
Restricted band // Horizontal // Peak // Below



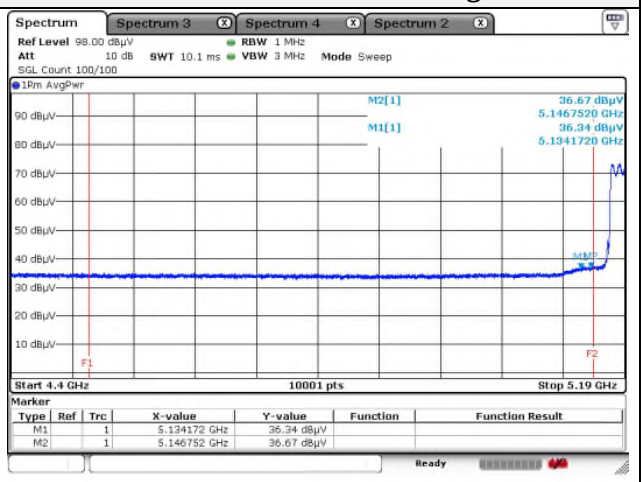
Restricted band // Vertical // Peak // Below



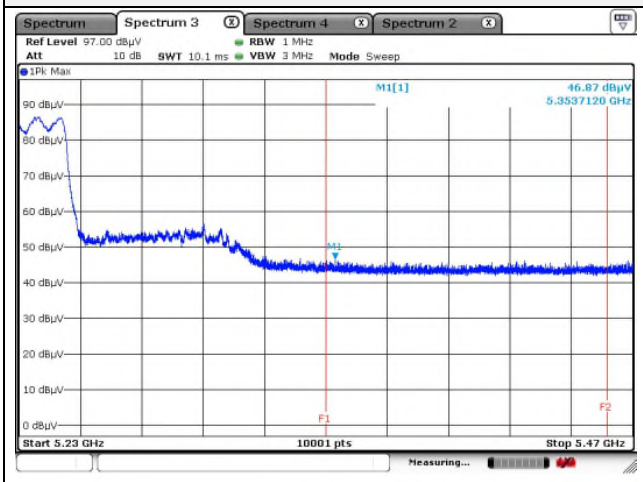
Restricted band // Horizontal // Average // Below



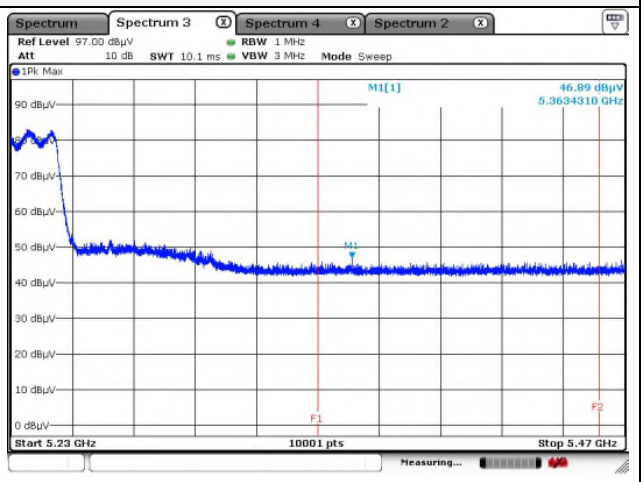
Restricted band // Vertical // Average // Below



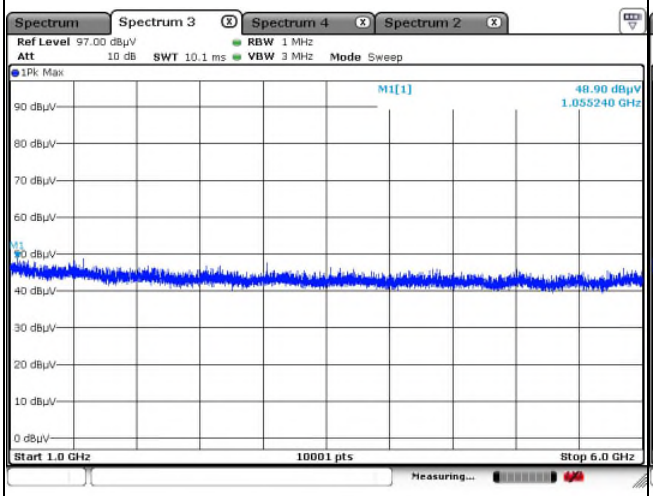
Restricted band // Horizontal // Peak // Above



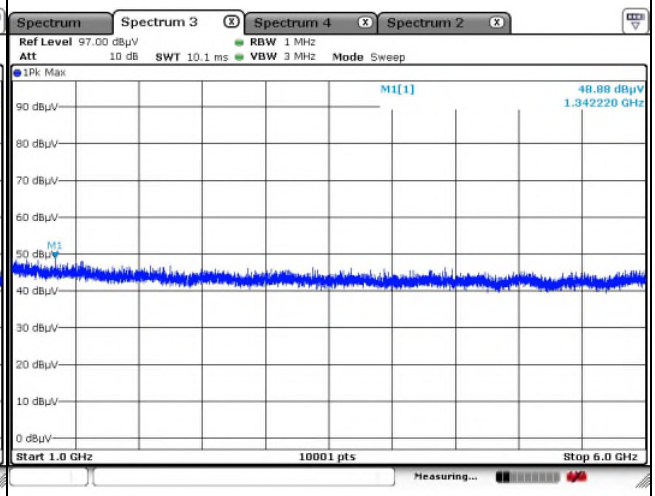
Restricted band // Vertical // Peak // Above



Horizontal // Peak for 1 ㎓ to 6 ㎓



Vertical // Peak for 1 ㎓ to 6 ㎓



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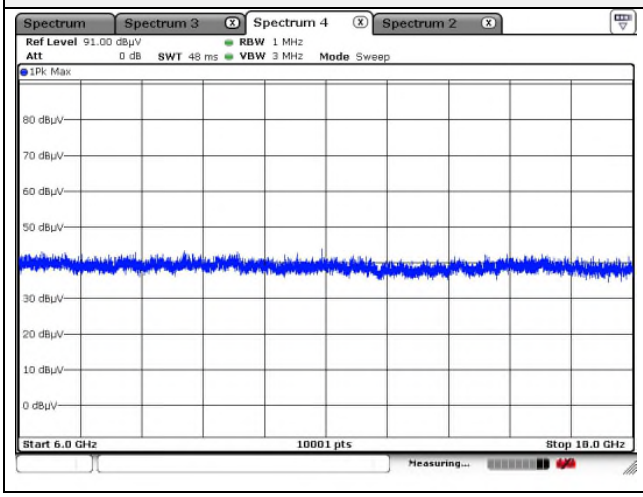
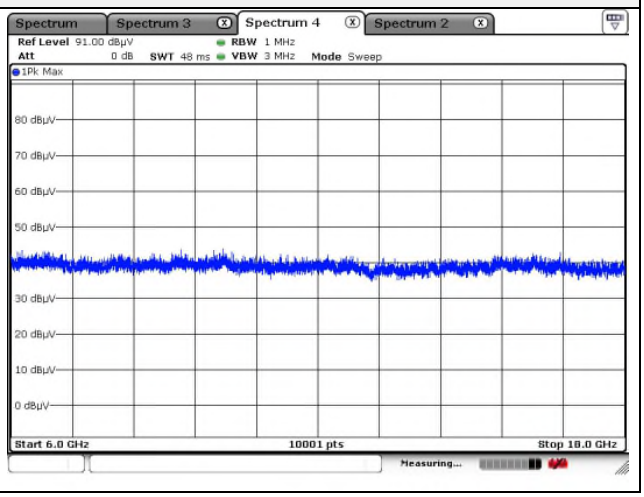
Horizontal // Peak for 6 ㎓ to 18 ㎓	Vertical // Peak for 6 ㎓ to 18 ㎓
	

Note.

1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode:	UNII-3 802.11a
Distance of measurement:	3 meter
Channel:	149

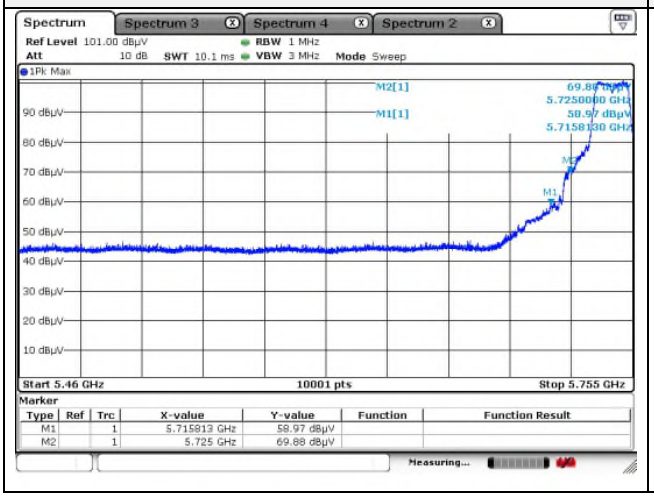
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1000.25	49.25	Peak	H	-11.32	-	37.93	74.00	36.07
1173.73	48.09	Peak	V	-10.54	-	37.55	74.00	36.45

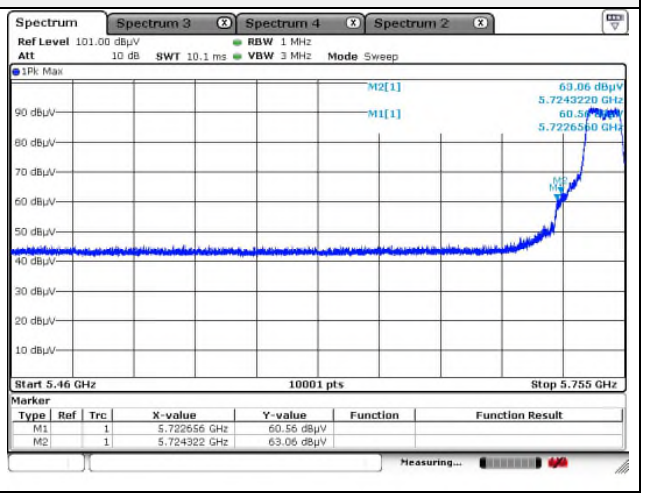
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5715.81	58.97	Peak	H	5.29	-	64.26	109.63	45.37
5725.00	69.88	Peak	H	5.34	-	75.22	122.20	46.98
5722.66	60.56	Peak	V	5.32	-	65.88	116.86	50.98
5724.32	63.06	Peak	V	5.32	-	68.38	120.65	52.27

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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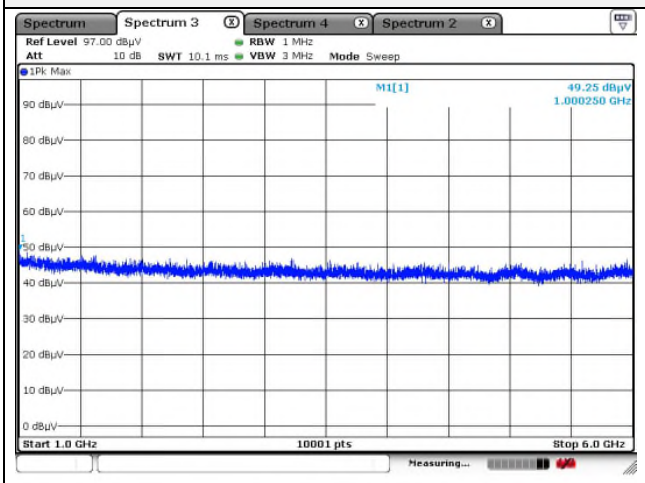
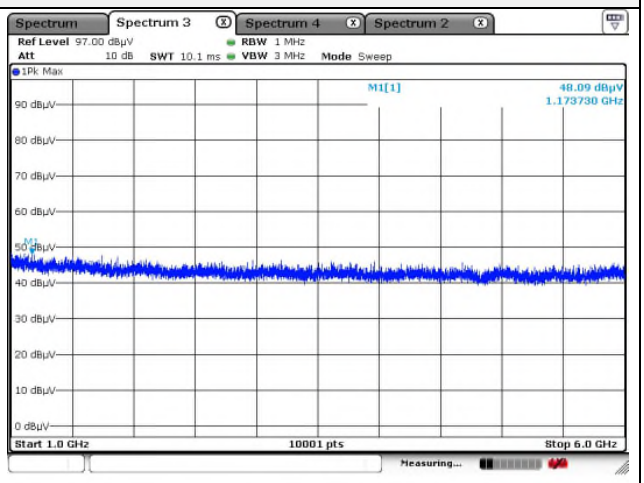
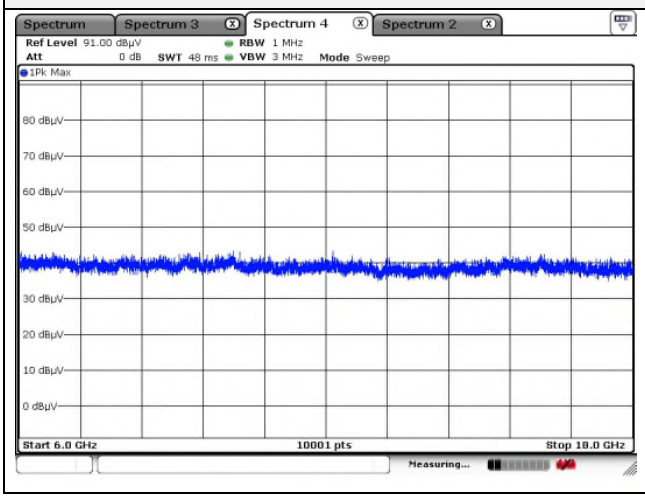
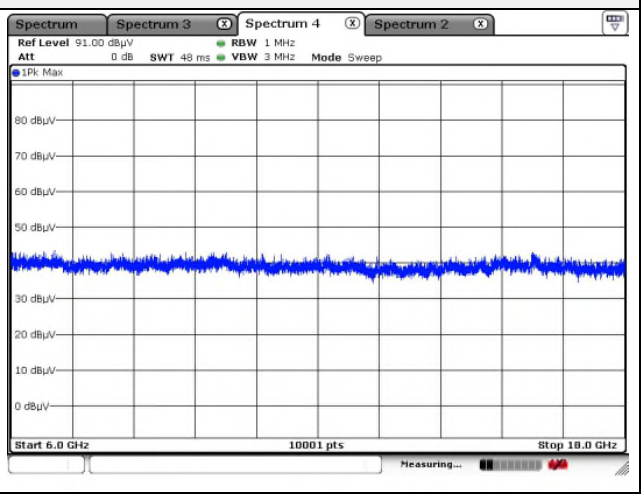
Horizontal // Peak for 1 ㎓ to 6 ㎓	Vertical // Peak for 1 ㎓ to 6 ㎓
	
Horizontal // Peak for 6 ㎓ to 18 ㎓	**Vertical // Peak for 6 ㎓ to 18 ㎓**
	

Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11a

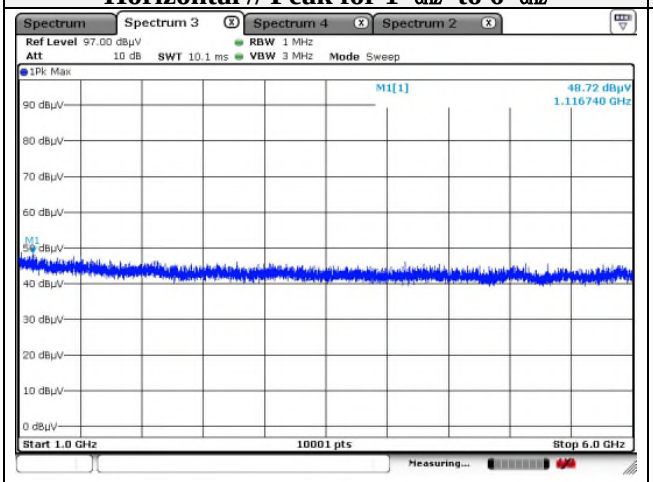
Distance of measurement: 3 meter

Channel: 157

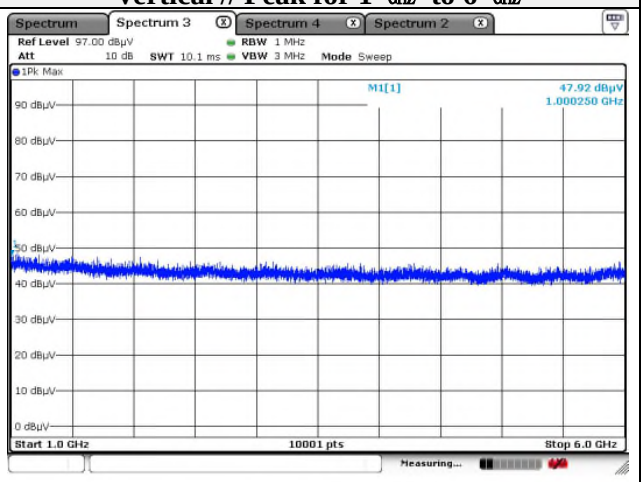
- **Spurious**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1116.74	48.72	Peak	H	-10.79	-	37.93	74.00	36.07
1000.25	47.92	Peak	V	-11.32	-	36.60	74.00	37.40

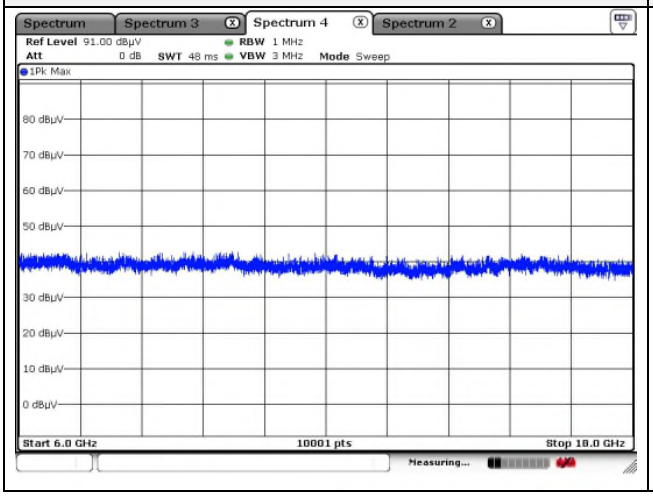
Horizontal // Peak for 1 ㎓ to 6 ㎓



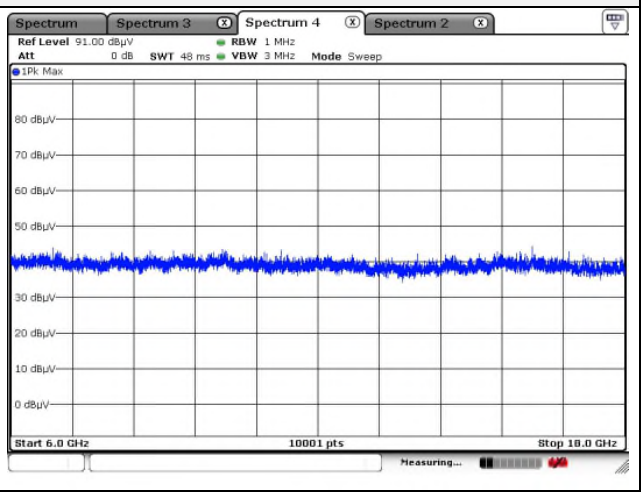
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.
1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode: UNII-3 802.11a

Distance of measurement: 3 meter

Channel: 165

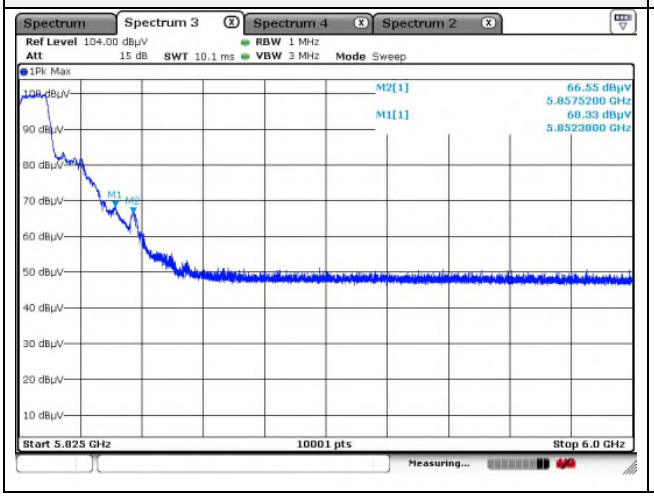
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1037.25	48.09	Peak	H	-11.15	-	36.94	74.00	37.06
1000.25	48.81	Peak	V	-11.32	-	37.49	74.00	36.51

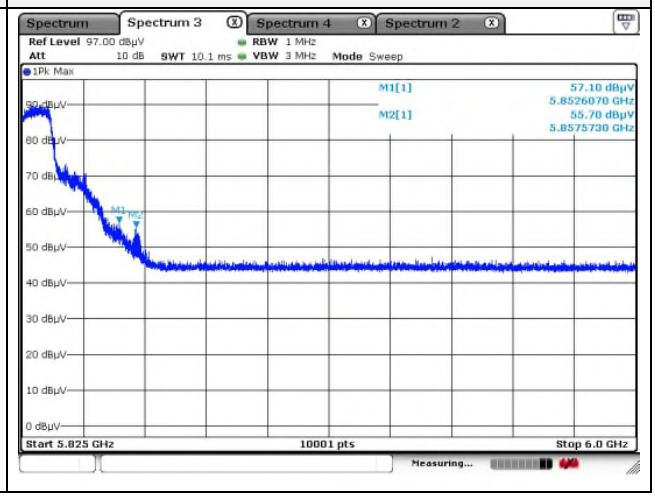
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5852.38	68.33	Peak	H	5.74	-	74.07	116.77	42.70
5857.52	66.55	Peak	H	5.74	-	72.29	110.09	37.80
5852.61	57.10	Peak	V	5.74	-	62.84	116.25	53.41
5857.57	55.70	Peak	V	5.74	-	61.44	110.08	48.64

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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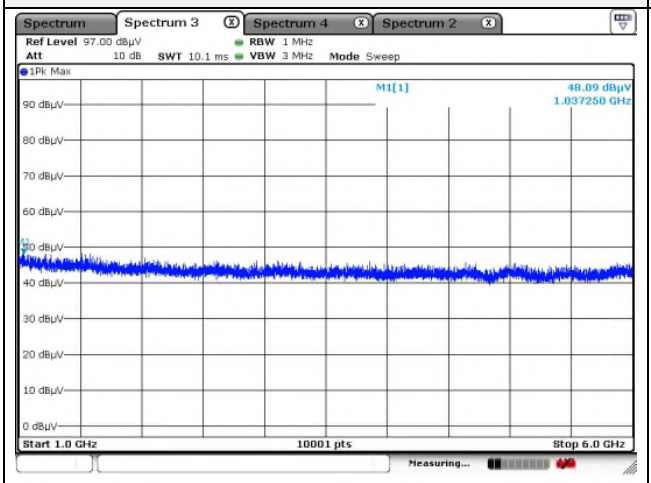
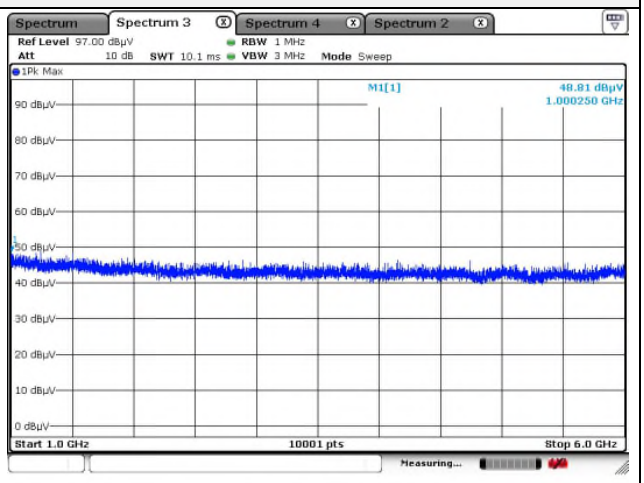
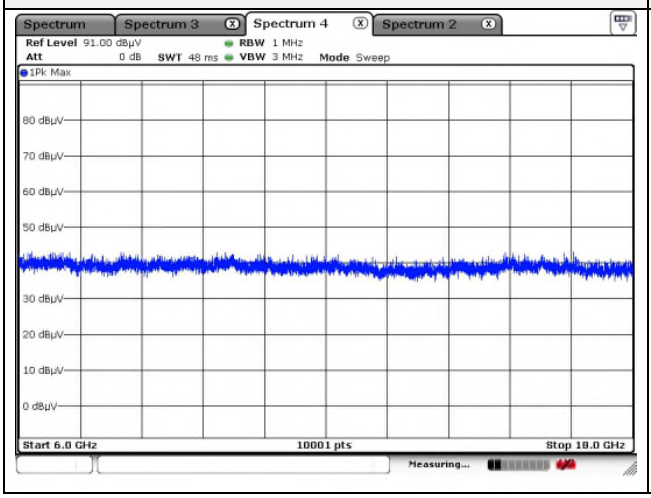
Horizontal // Peak for 1 ㎓ to 6 ㎓



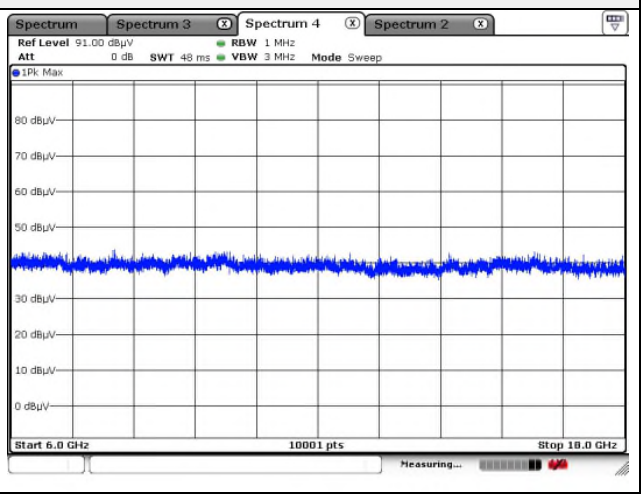
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11n_HT20

Distance of measurement: 3 meter

Channel: 149

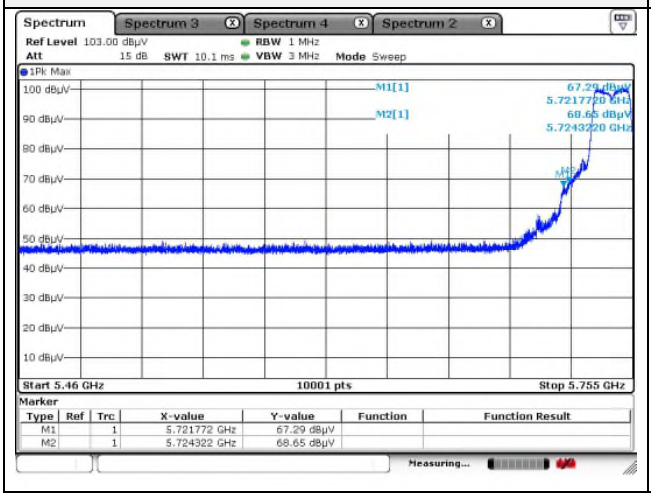
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1106.74	48.39	Peak	H	-10.85	-	37.54	74.00	36.46
1056.74	48.04	Peak	V	-11.07	-	36.97	74.00	37.03

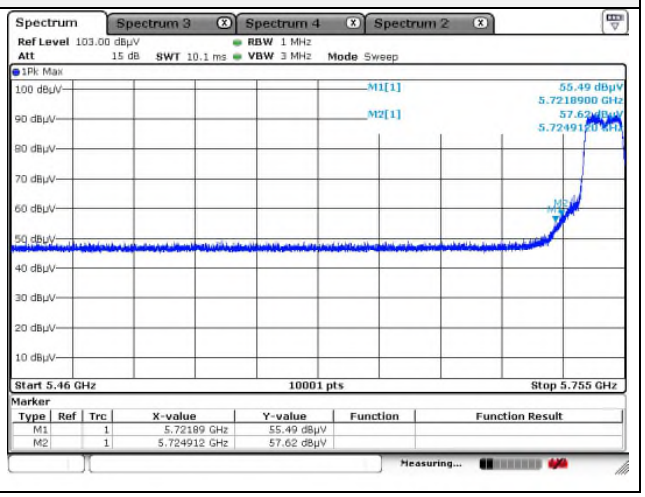
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5721.77	67.29	Peak	H	5.32	-	72.61	114.84	42.23
5724.32	68.65	Peak	H	5.32	-	73.97	120.65	46.68
5721.89	55.49	Peak	V	5.32	-	60.81	115.11	54.30
5724.91	57.62	Peak	V	5.33	-	62.95	121.99	59.04

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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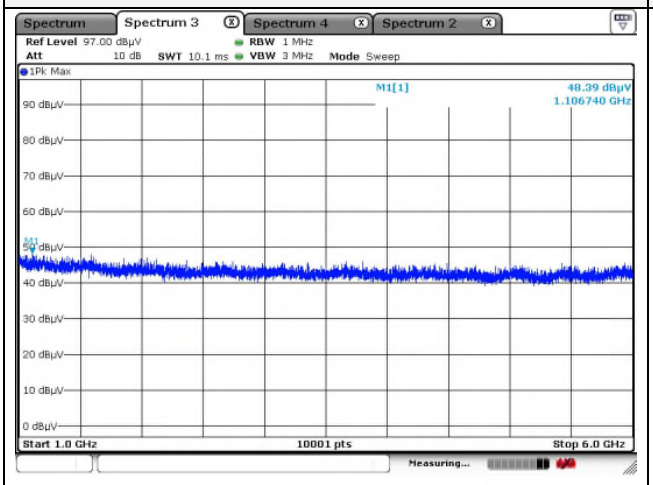
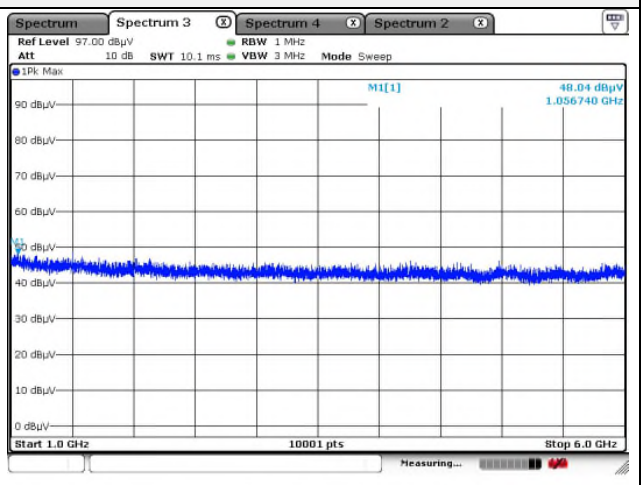
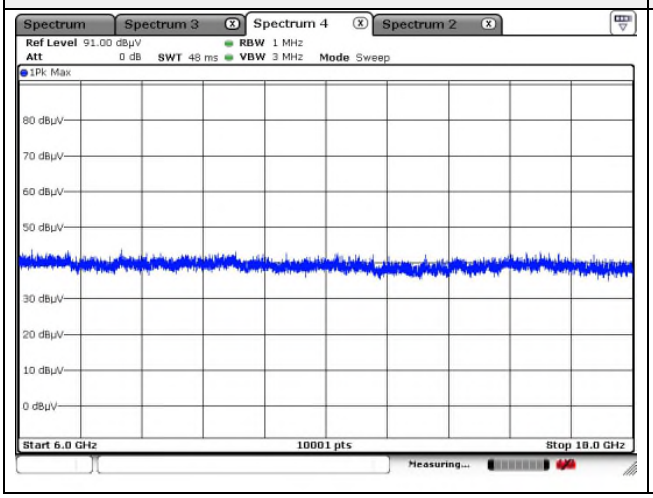
Horizontal // Peak for 1 ㎓ to 6 ㎓



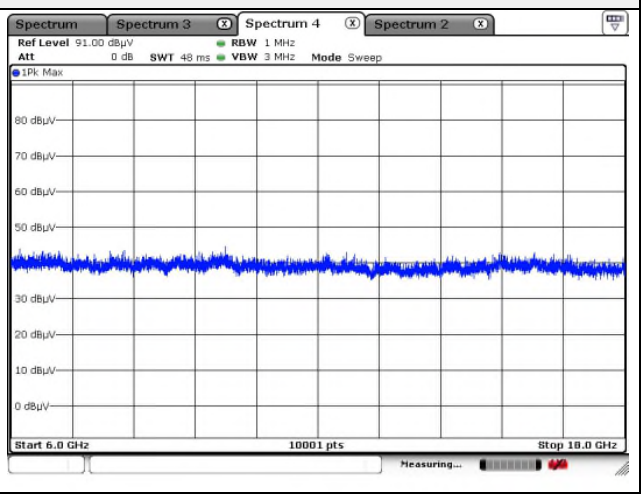
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.
1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11n_HT20

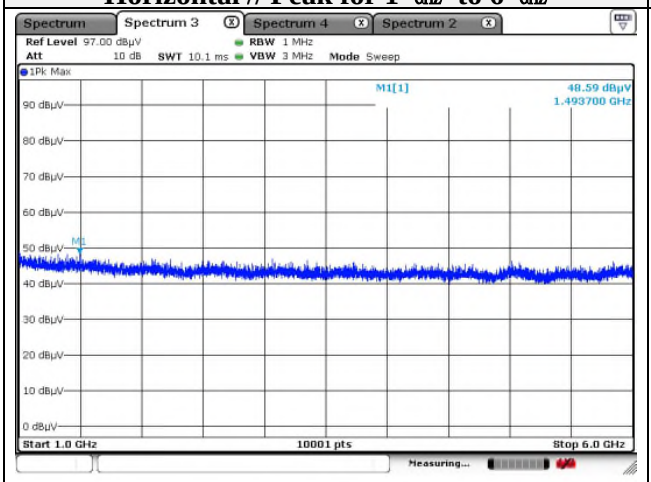
Distance of measurement: 3 meter

Channel: 157

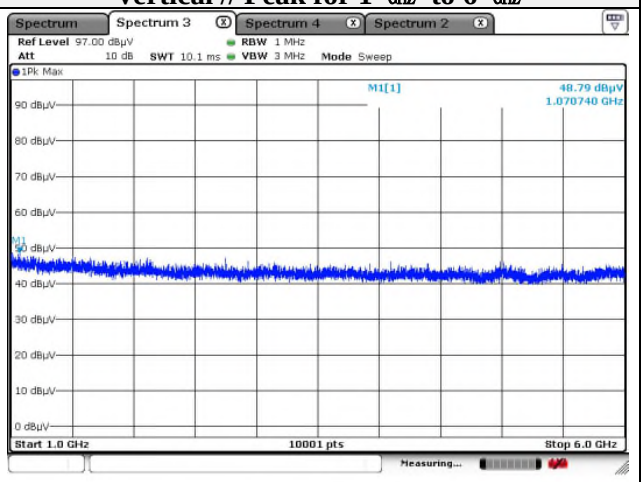
- **Spurious**

Frequency (㎒)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1493.70	48.59	Peak	H	-9.08	-	39.51	74.00	34.49
1070.74	48.79	Peak	V	-11.00	-	37.79	74.00	36.21

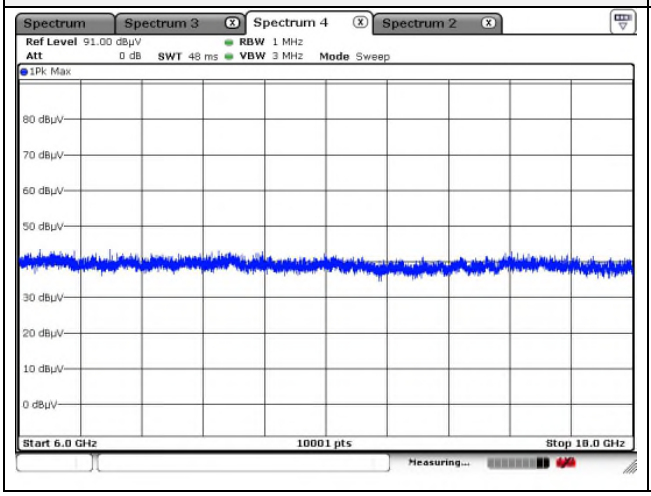
Horizontal // Peak for 1 ㎓ to 6 ㎓



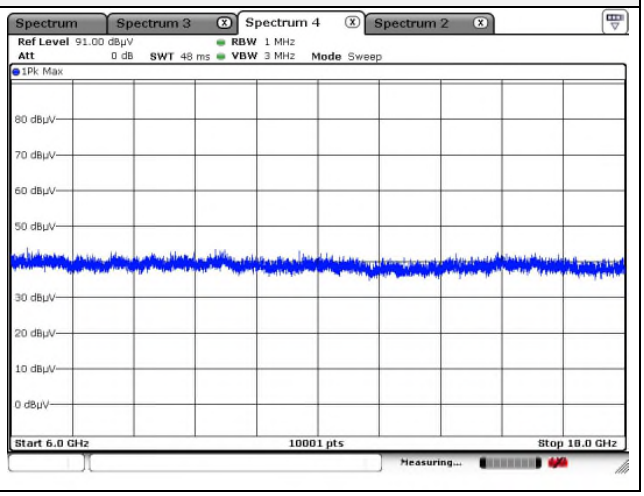
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.
1. No spurious emission were detected above 6 ㎓.
2. Average test would be performed if the peak result were greater than the average limit.

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Mode: UNII-3 802.11n_HT20

Distance of measurement: 3 meter

Channel: 165

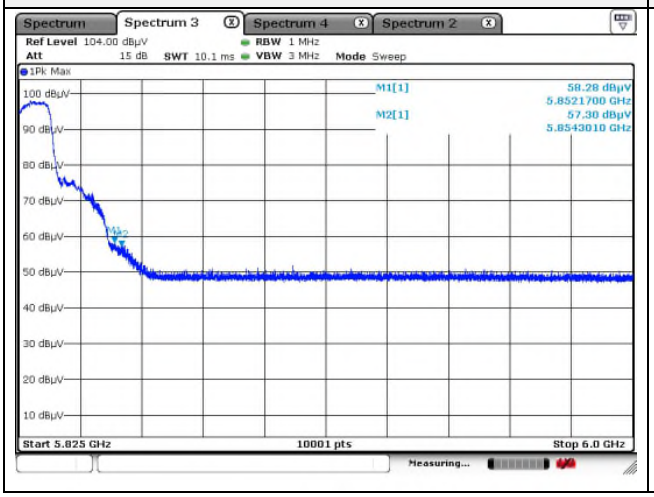
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1035.75	47.97	Peak	H	-11.16	-	36.81	74.00	37.19
1295.22	47.67	Peak	V	-9.99	-	37.68	68.23	30.55

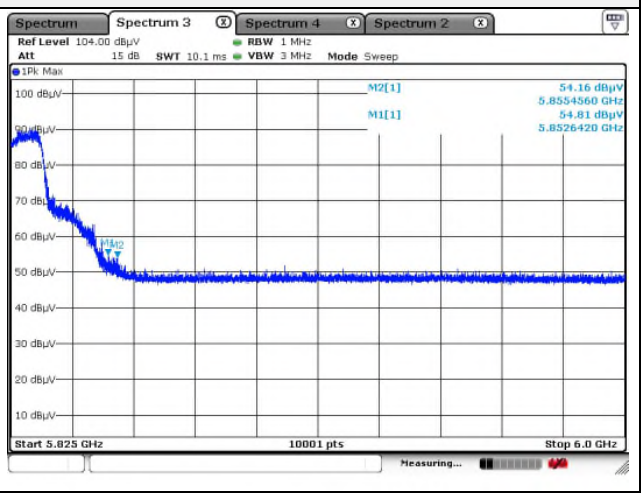
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5852.17	58.28	Peak	H	5.74	-	64.02	117.25	53.23
5854.30	57.30	Peak	H	5.73	-	63.03	112.40	49.37
5855.46	54.16	Peak	V	5.74	-	59.90	110.67	50.77
5852.64	54.81	Peak	V	5.74	-	60.55	116.18	55.63

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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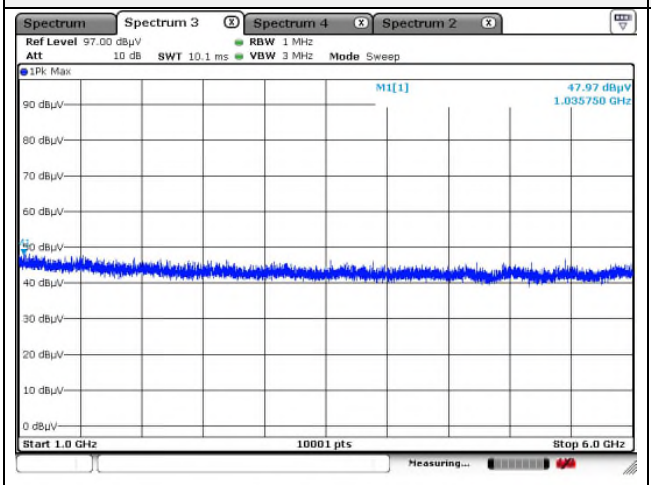
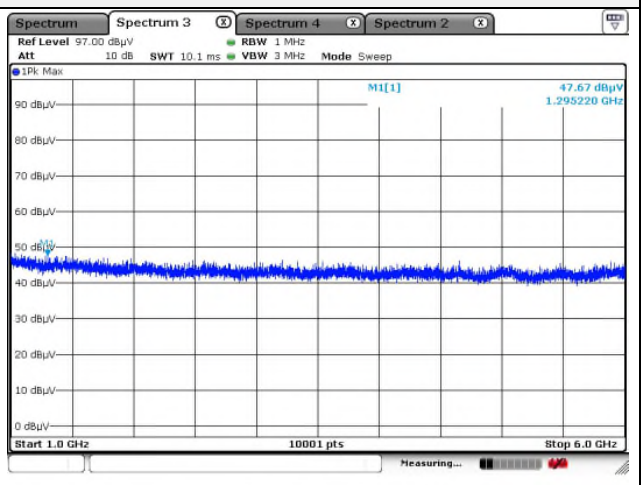
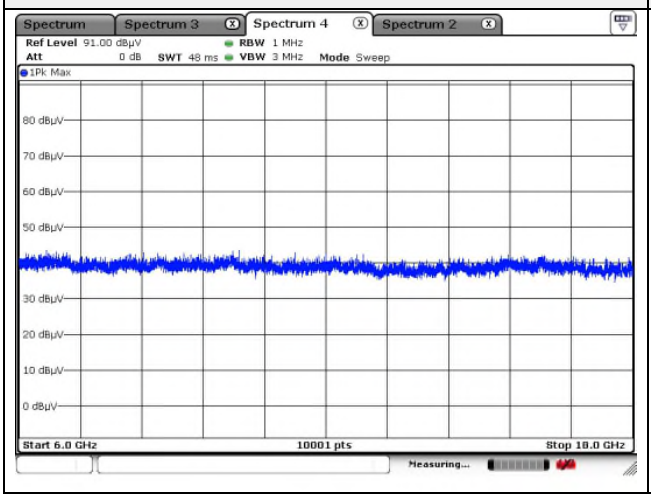
Horizontal // Peak for 1 ㎓ to 6 ㎓



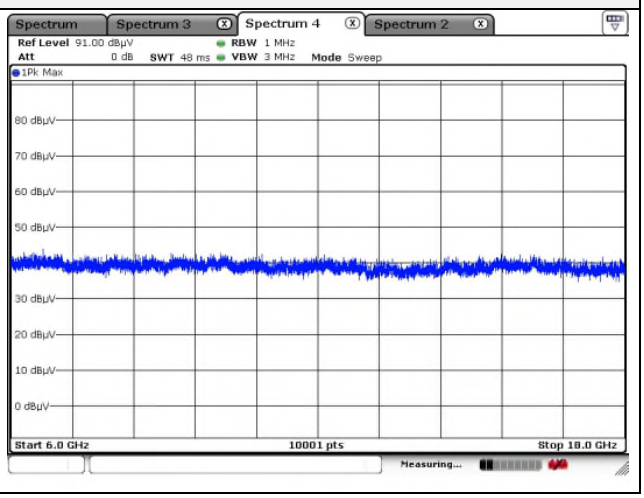
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11n_HT40

Distance of measurement: 3 meter

Channel: 151

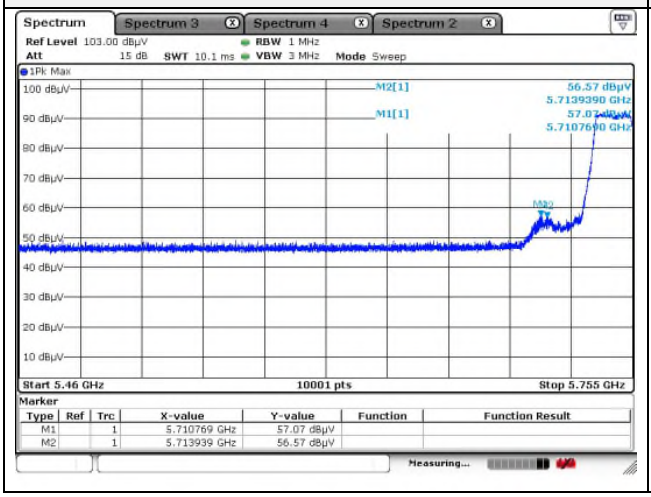
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1017.75	48.90	Peak	H	-11.24	-	37.66	74.00	36.34
1026.75	48.07	Peak	V	-11.20	-	36.87	74.00	37.13

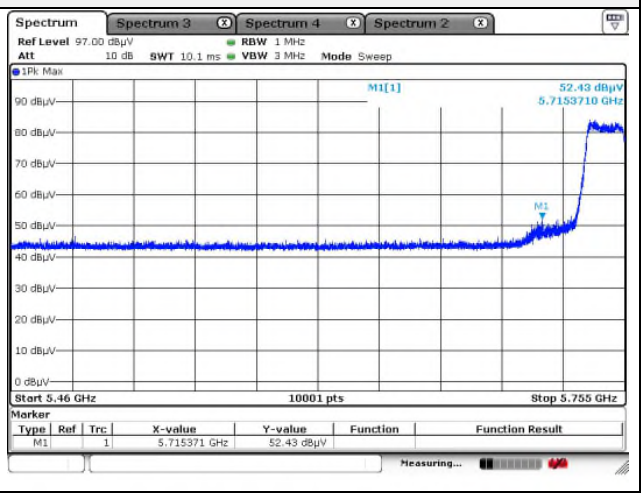
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5710.77	57.07	Peak	H	5.26	-	62.33	108.22	45.89
5713.94	56.57	Peak	H	5.28	-	61.85	109.10	47.25
5715.37	52.43	Peak	V	5.29	-	57.72	109.50	51.78

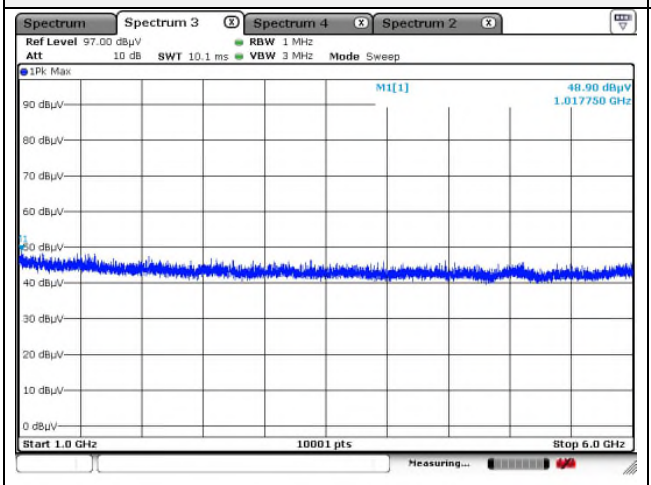
Restricted band // Horizontal // Peak



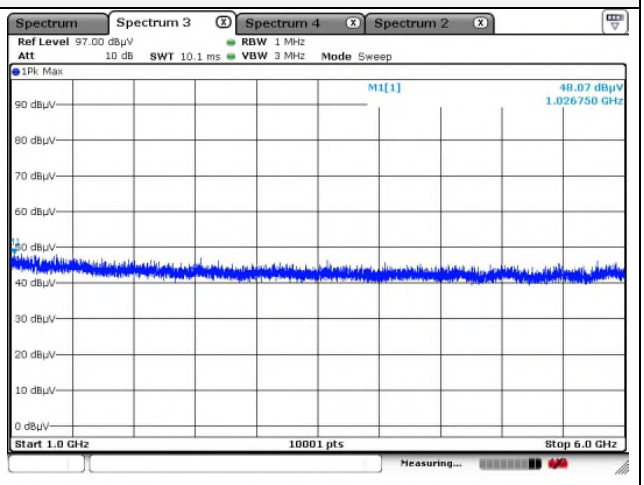
Restricted band // Vertical // Peak



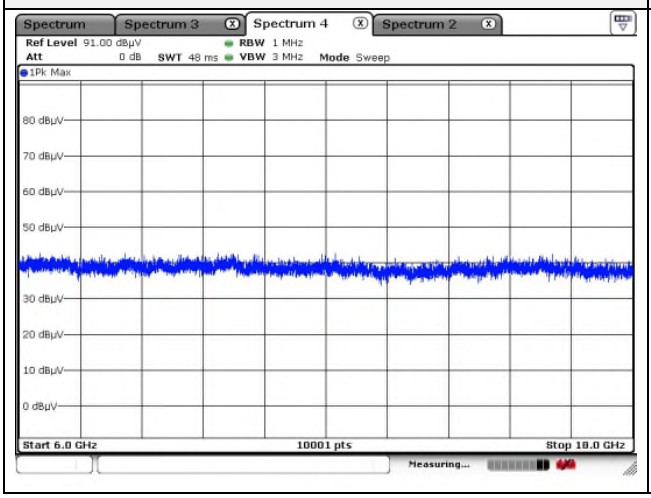
Horizontal // Peak for 1 ㎓ to 6 ㎓



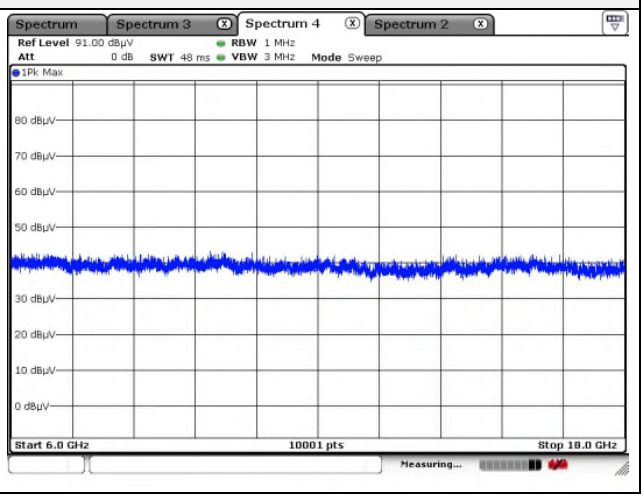
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.
1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11n_HT40

Distance of measurement: 3 meter

Channel: 159

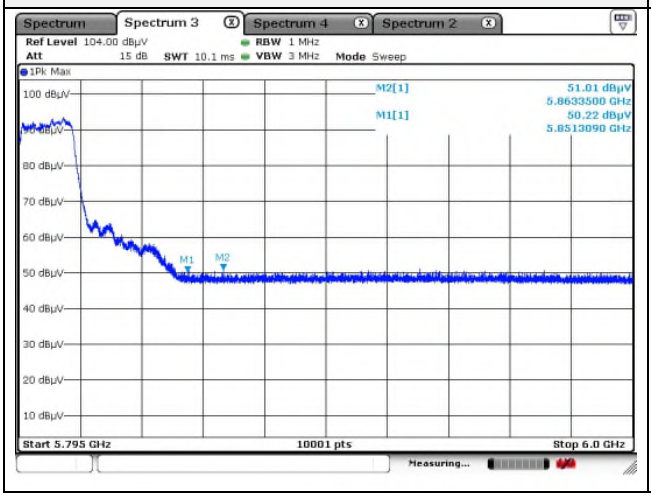
- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1195.23	48.33	Peak	H	-10.44	-	37.89	74.00	36.11
1500.20	48.93	Peak	V	-9.05	-	39.88	74.00	34.12

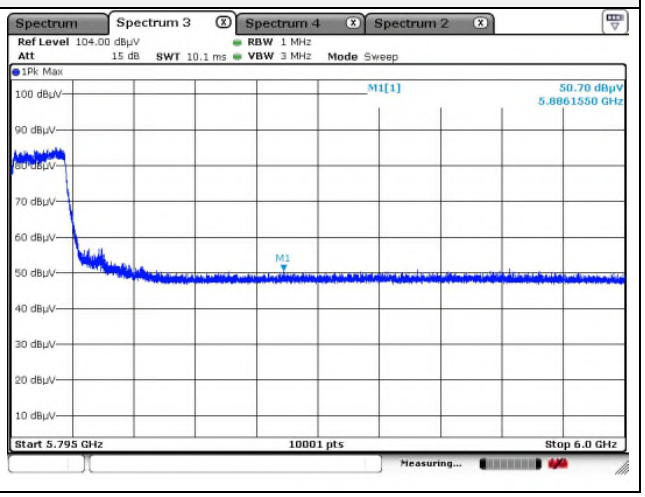
- **Band edge**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5851.31	50.22	Peak	H	5.73	-	55.95	119.21	63.26
5863.35	51.01	Peak	H	5.75	-	56.76	108.46	51.70
5886.16	50.70	Peak	V	5.77	-	56.47	96.02	39.55

Restricted band // Horizontal // Peak



Restricted band // Vertical // Peak



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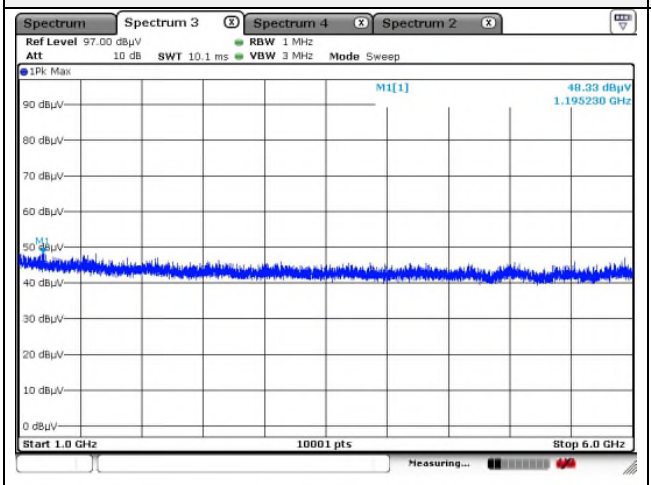
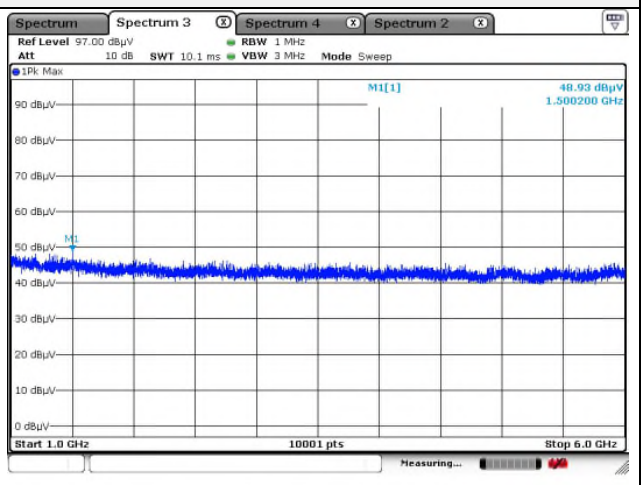
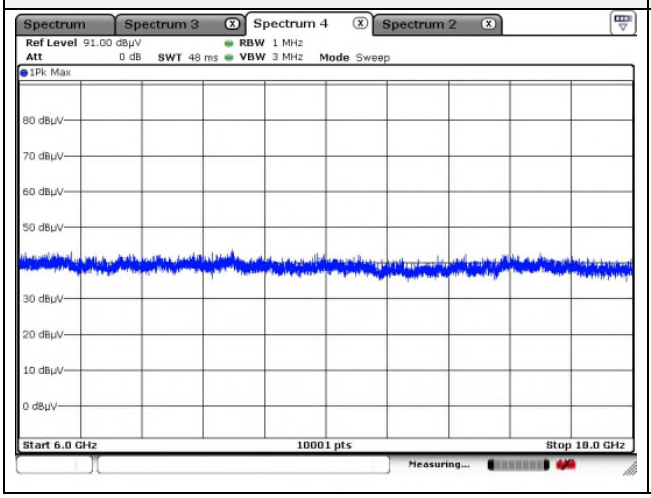
Horizontal // Peak for 1 ㎓ to 6 ㎓



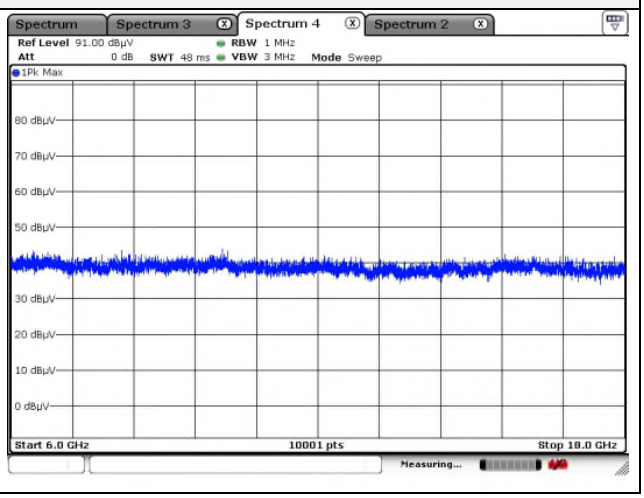
Vertical // Peak for 1 ㎓ to 6 ㎓



Horizontal // Peak for 6 ㎓ to 18 ㎓



Vertical // Peak for 6 ㎓ to 18 ㎓



Note.

1. No spurious emission were detected above 6 ㎓.

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Mode: UNII-3 802.11ac_VHT80

Distance of measurement: 3 meter

Channel: 155

- **Spurious**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1005.25	47.94	Peak	H	-11.30	-	36.64	74.00	37.36
1005.75	48.53	Peak	V	-11.30	-	37.23	74.00	36.77

- **Band edge // Below**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5703.16	51.26	Peak	H	5.23	-	56.49	106.08	49.59
5710.56	51.12	Peak	H	5.26	-	56.38	108.16	51.78
5699.65	47.08	Peak	V	5.22	-	52.30	104.94	52.64

- **Band edge // Above**

Frequency (MHz)	Level (dBμV)	Detect mode	Ant. Pol. (H/V)	CF (dB)	DCF (dB)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5860.04	49.78	Peak	H	5.74	-	55.52	109.39	53.87
5851.41	46.40	Peak	V	5.73	-	52.13	118.99	66.86

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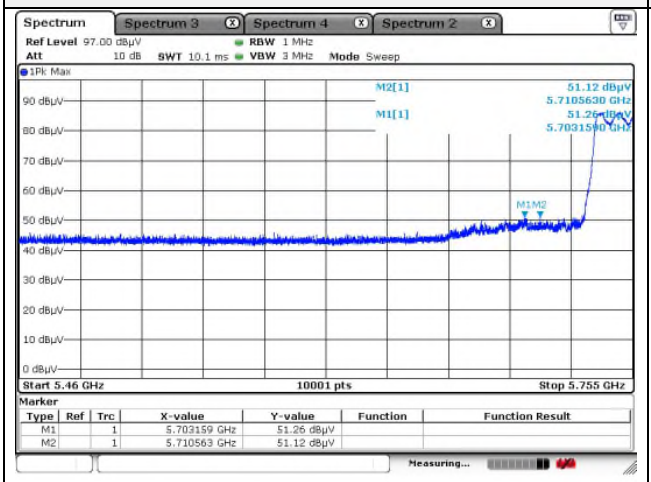
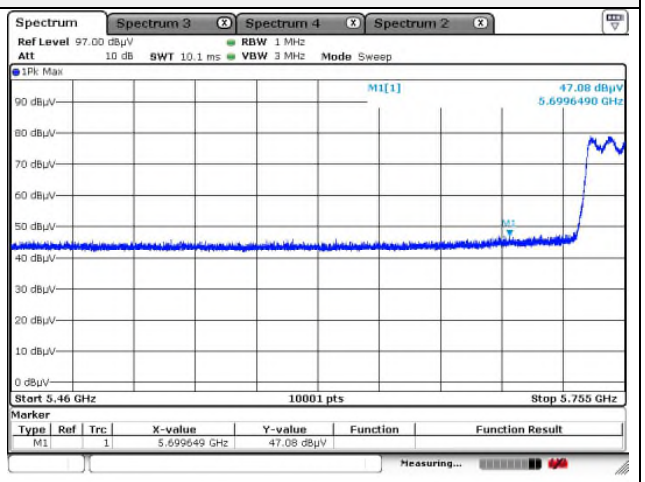
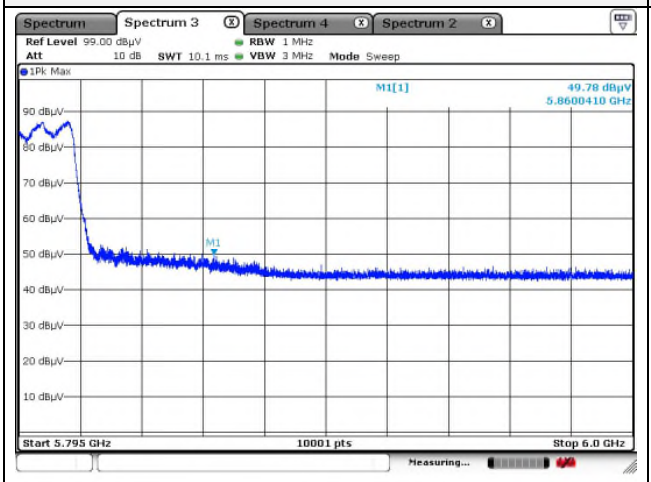
Restricted band // Horizontal // Peak // Below



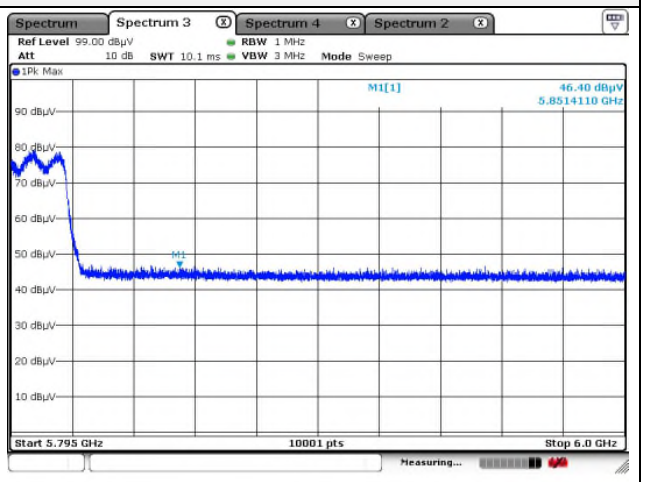
Restricted band // Vertical // Peak // Below



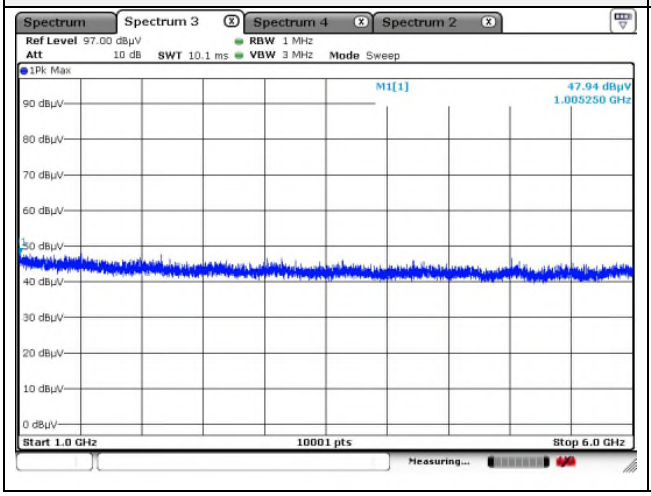
Restricted band // Horizontal // Peak // Above



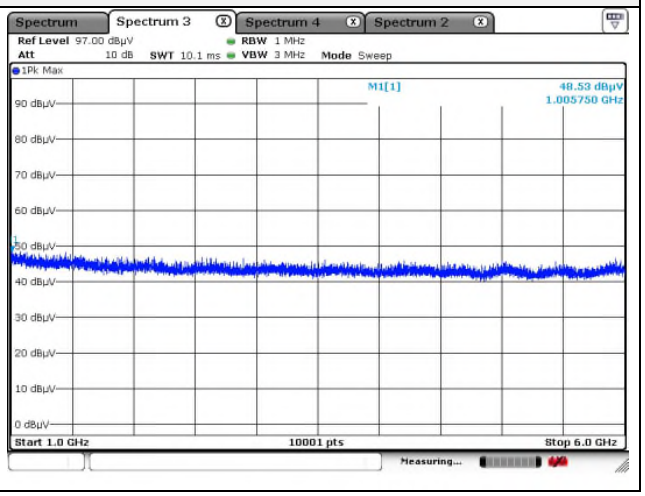
Restricted band // Vertical // Peak // Above



Horizontal // Peak for 1 ㎓ to 6 ㎓



Vertical // Peak for 1 ㎓ to 6 ㎓



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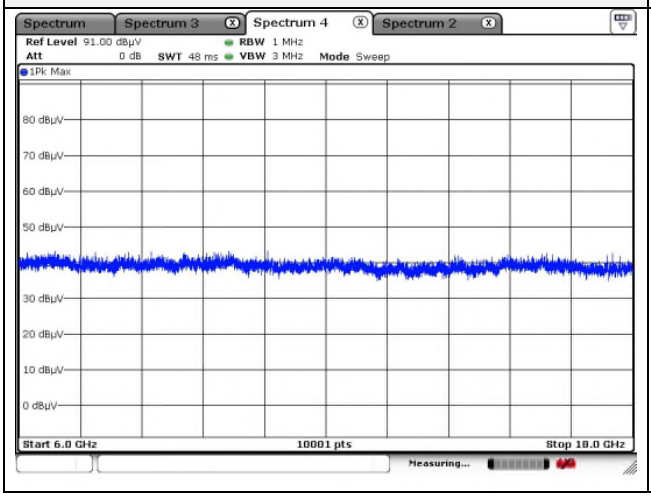
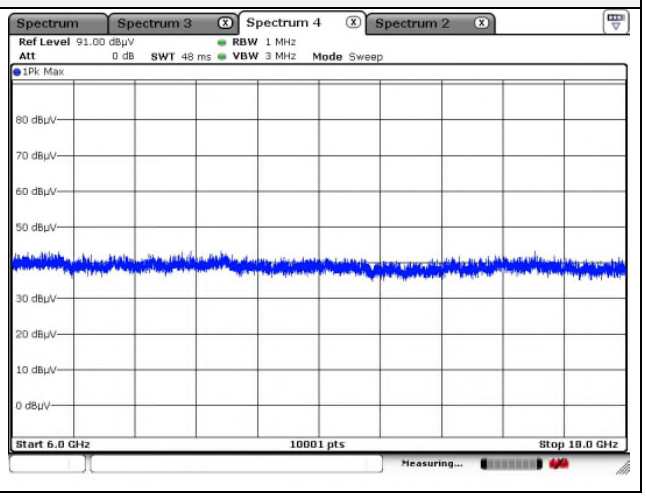
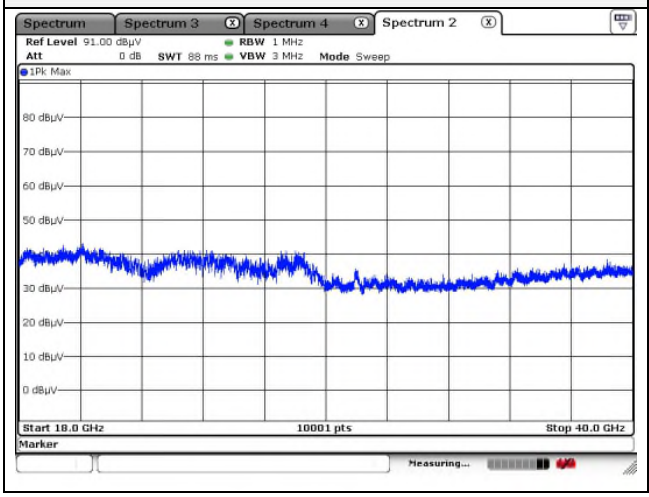
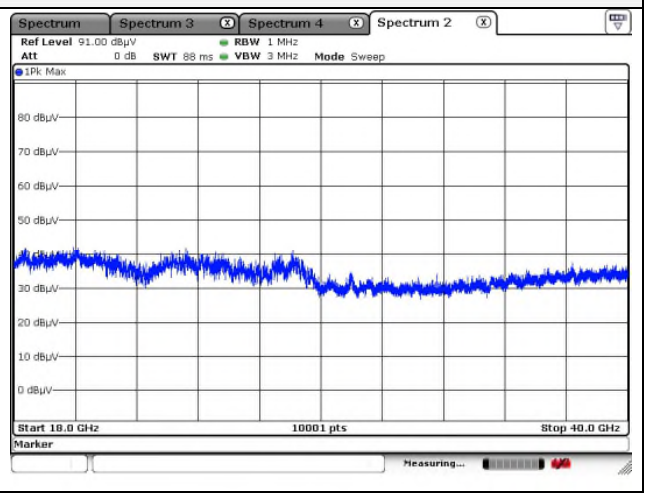
Horizontal // Peak for 6 ㎓ to 18 ㎓	Vertical // Peak for 6 ㎓ to 18 ㎓
	

1. No spurious emission were detected above 6 ㎓.

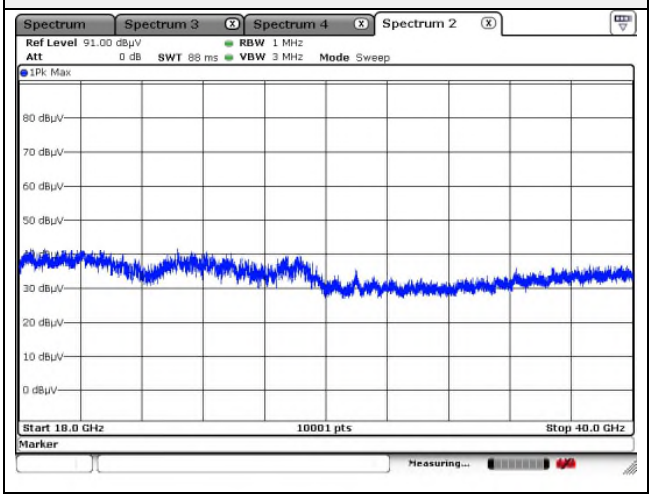
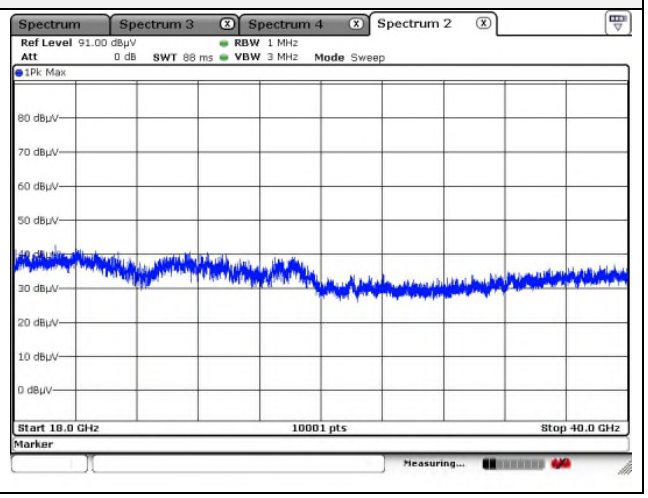
Test results (18 ㎓ to 40 ㎓) – Worst case

Mode:	UNII-1 802.11a
Distance of measurement:	3 meter
Channel:	36

Horizontal	Vertical
	

Note.
1. No spurious emission were detected above 18 ㎓.

Mode:	UNII-3 802.11a
Distance of measurement:	3 meter
Channel:	149

Horizontal	Vertical
	

Note.
1. No spurious emission were detected above 18 ㎓.

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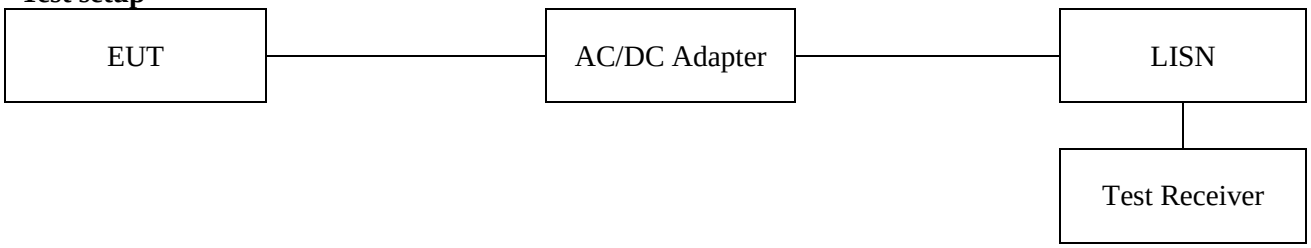
3.7 AC conducted emissions

Test setup



Limit

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 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

Frequency of Emission (㎒)	Conducted limit (dBμV/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

Note:

1. All AC line conducted spurious emission are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and the appropriate frequencies. All data rates and modes were investigated for conducted spurious emission. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.
2. Both Cable loss and LISN factor are included in measurement level(QP Level or AV Level).

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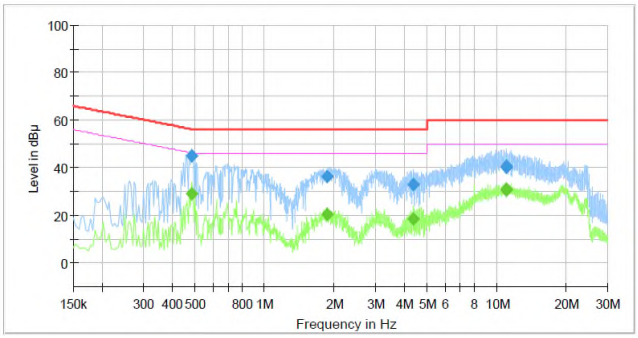
Test results

Mode: UNII-3_802.11a (Worst case)

Distance of measurement: 3 meter

Channel: 149 (Worst case)

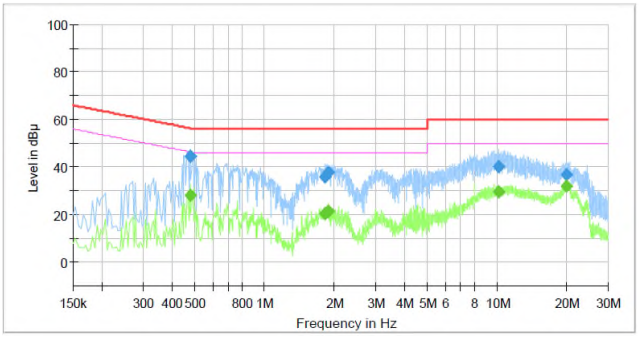
Hot Line



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.486000	---	29.17	46.24	17.07	1000.0	9.000	L1	19.8
0.486000	45.22	---	56.24	11.02	1000.0	9.000	L1	19.8
1.870000	---	20.61	46.00	25.39	1000.0	9.000	L1	20.4
1.870000	36.37	---	56.00	19.63	1000.0	9.000	L1	20.4
4.354000	---	18.48	46.00	27.52	1000.0	9.000	L1	19.9
4.354000	33.16	---	56.00	22.84	1000.0	9.000	L1	19.9
10.950000	---	30.71	50.00	19.29	1000.0	9.000	L1	20.4
10.950000	40.38	---	60.00	19.62	1000.0	9.000	L1	20.4
11.042000	---	30.86	50.00	19.14	1000.0	9.000	L1	20.4
11.042000	40.87	---	60.00	19.13	1000.0	9.000	L1	20.4

Neutral Line



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.478000	---	27.94	46.37	18.43	1000.0	9.000	N	19.8
0.478000	44.37	---	56.37	12.00	1000.0	9.000	N	19.8
1.826000	---	20.24	46.00	25.76	1000.0	9.000	N	20.3
1.826000	35.80	---	56.00	20.20	1000.0	9.000	N	20.3
1.874000	---	21.44	46.00	24.56	1000.0	9.000	N	20.4
1.874000	37.53	---	56.00	18.47	1000.0	9.000	N	20.4
10.150000	---	29.65	50.00	20.35	1000.0	9.000	N	20.3
10.150000	40.33	---	60.00	19.67	1000.0	9.000	N	20.3
19.926000	---	31.93	50.00	18.07	1000.0	9.000	N	21.0
19.926000	36.97	---	60.00	23.03	1000.0	9.000	N	21.0

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Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	1 year	2021.04.01
SPECTRUM ANALYZ ER	R&S	FSV40	101725	1 year	2021.06.22
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2021.01.15
SIGNAL GENERATOR	KEYSIGHT	N5182B	MY59100115	1 year	2021.05.12
Power Meter	Anritsu	ML2495A	1438001	1 year	2021.05.12
Pulse Power Sensor	Anritsu	MA2411B	1339205	1 year	2021.05.12
DC POWER SUPPLY	SORENSEN	DCS40-75E	1408A02745	1 year	2021.01.15
ATTENUATOR	Mini-Circuits	BW-S10-2W263+	1	1 year	2021.01.17
Loop Antenna	Schwarzbeck	FMZB1513	225	2 years	2021.02.15
BILOG ANTENNA	VULB 9168	SCHWARZBECK	9168-461	2 years	2022.05.26
HORN ANTENNA	A.H.	SAS-571	414	1 years	2021.01.31
BAND REJECT FILTER	MICRO-TRONICS	BRM50702	G272	1 year	2021.01.15
BAND REJECT FILTER	MICRO-TRONICS	BRM50716	G199	1 year	2021.01.15
AMPLIFIER	310N	SONOMA INSTRUMENT	401123	1 year	2021.06.08
PREAMPLIFIER	8449B	AGILENT	8008A01640	1 year	2021.04.01
ATTENUATOR	F04-C1206-01	SRT	20022403	1 year	2021.05.06
EMI Test Receiver	R&S	ESR3	101783	1 year	2021.01.20
EMI Test Receiver	R&S	ESU26	100552	1 year	2021.04.01
Pulse Limiter	R&S	ESH3-Z2	101915	1 year	2021.01.02
LISN	R&S	ENV216	101787	1 year	2021.01.02

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
Notebook computer	LG Electronics Inc.,	15UD590	904QCSF564006
Test Jig Board	N/A	N/A	N/A

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