TEST REPORT

KCTL Inc.
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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1. Client

- Name : NEW OPTICS LTD.
- Address : 315, Hyuam-ro 392beon-gil, Nam-myeon, Yangju-si, Gyeonggi-do, Republic of Korea
- Date of Receipt : 2016-06-01

2. Use of Report : -

3. Name of Product and Model : Digital Canvas 265SQ / 265BXQ7W-UC

4. Manufacturer and Country of Origin : NEW OPTICS LTD. / Korea

5. FCC ID : 2AIWQ-265BXQ7W-UC

6. IC : 22127-265BXQ7W

6. Date of Test : 2016-10-21 to 2016-10-31

7. Test Standards : FCC Part 15 Subpart E, 15.407
RSS-247 Issue 1 May 2015
RSS GEN Issue 4 November 2014

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

Affirmation	Tested by Name : Euijung Kim (Signature)	Technical Manager Name : Changmin Kim (Signature)

2017-02-14

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2016-11-03	Originally issued	-
2017-02-09	Delete ID from IC ID and Test Standards revised.	1
2017-02-14	Add IC power and revised radiation data.	16, 50 ~ 59

[Contents]

1. Client information

Applicant:	NEW OPTICS LTD.
Address:	315, Hyuam-ro 392beon-gil, Nam-myeon, Yangju-si, Gyeonggi-do, Republic of Korea
Telephone number:	+82-31-860-7877
Facsimile number:	+82-31-860-7787
Contact person:	Guhoon Kim / kgh951us@newoptics.net

Manufacturer:	NEW OPTICS LTD.
Address:	315, Hyuam-ro 392beon-gil, Nam-myeon, Yangju-si, Gyeonggi-do, Republic of Korea

2. Laboratory information

Address

KCTL Inc.

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

Telephone Number: 82 70 5008 1021

Facsimile Number: 82 505 299 8311

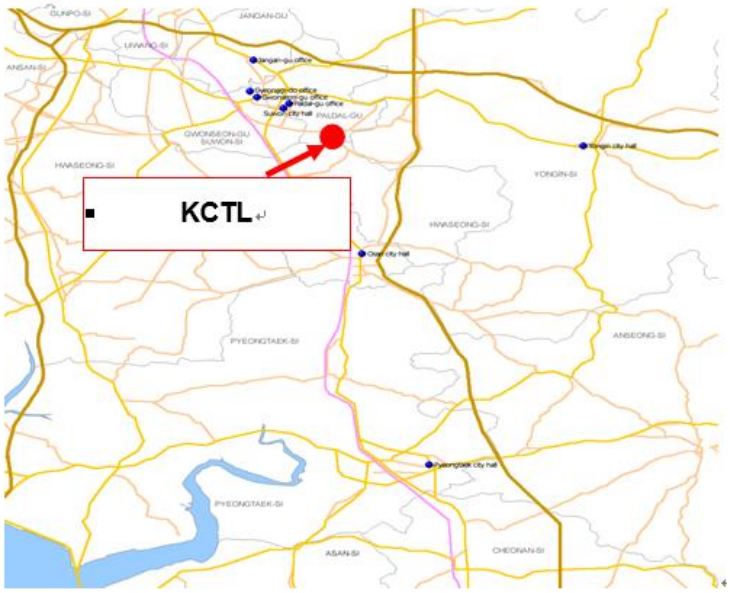
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

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	NEW OPTICS LTD.
Address of Applicant	315, Hyuam-ro 392beon-gil, Nam-myeon, Yangju-si, Gyeonggi-do, Republic of Korea
Manufacturer	NEW OPTICS LTD.
Address of Manufacturer	315, Hyuam-ro 392beon-gil, Nam-myeon, Yangju-si, Gyeonggi-do, Republic of Korea
Type of equipment	Digital Canvas 265SQ
Basic Model	265BXQ7W-UC
Variant Model [1)]	265BXQ7W-US, 265BXQ7W-UW, 265BXQ7W-NC, 265BXQ7W-NS, 265BXQ7W-NW, 265BXQ4W-UC, 265BXQ4W-US, 265BXQ4W-UW, 265BXQ4W-NC, 265BXQ4W-NS, 265BXQ4W-NW, 265BXQ7W-KC, 265BXQ4W-KC, 265BSQ7W-KC, 265BSQ4W-KC
Serial number	N/A

1) Difference of Buyer or Buyer's Solution.

3.2 General description

Frequency Range	2 412 ㎒ ~ 2 462 ㎒ (802.11b/g/n_HT20), 2 402 ㎒ ~ 2 480 ㎒ (Bluetooth, Bluetooth Low Energy), 5 180 ㎒ ~ 5 240 ㎒ (802.11a), 5 260 ㎒ ~ 5 320 ㎒ (802.11a), 5 500 ㎒ ~ 5 700 ㎒ (802.11a), 5 745 ㎒ ~ 5 825 ㎒ (802.11a)
Type of Modulation	DSSS (802.11b), OFDM (802.11a/g/n_HT20), GFSK (Bluetooth, Bluetooth Low Energy), π/4DQPSK, 8DPSK (Bluetooth)
The number of channels	2.4 ㎓: 11 ch (802.11b/g/n_HT20), 79 ch (Bluetooth), 40 ch (Bluetooth Low Energy) 5 ㎓: 5 150 ㎒ Band: 4 (802.11a), 5 250 ㎒ Band: 4 (802.11a) 5 470 ㎒ Band: 11 (802.11a), 5 725 ㎒ Band: 4 (802.11a)
Type of Antenna	FPCB Cable Antenna
Antenna Gain	-4.50 ㏈i (2 400 ㎒ ~ 2 483.5 ㎒), -3.50 ㏈i (5 150 ㎒ ~ 5 850 ㎒)
Transmit Power	-3.58 ㏈m
Power supply	DC 24.00 V
Product SW/HW version	Android 4.4.4 or Above
Radio SW/HW version	5.90.195.89.13
Test SW Version	RF Test Tool V4.7
RF power setting in TEST SW	Referred the measuring instrument from manufacturer

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

3.3 Test frequency

- 802.11a

Frequency	Band 1	Band 2	Band 3	Band 4
Lowest Frequency	5 180 ㎒	5 260 ㎒	5 500 ㎒	5 745 ㎒
Middle Frequency	5 200 ㎒	5 300 ㎒	5 580 ㎒	5 785 ㎒
Highest Frequency	5 240 ㎒	5 320 ㎒	5 700 ㎒	5 825 ㎒

3.4 Test Voltage

Mode	Voltage
Nominal Voltage	DC 24.00 V

4. Summary of test results

4.1 Standards & results

FCC Rule	IC Rule	Parameter	Report Section	Test Result
15.203 15.407(a)(1)(2)(3)	-	Antenna Requirement	5.1	C
15.407(a)(1)(2)	RSS-247, 5.4	Maximum Conducted Output Power	5.2	C
15.403(i),15.407(e)	RSS-247, 5.1 RSS-GEN, 6.6	Bandwidth Measurement	5.3	C
15.407(a)(1)(2)(5)	RSS-247, 5.3, (2)	Peak Power Spectral Density	5.4	C
15.205(a), 15.209(a), 15.407(b)(1), 15.407(b)(2), 15.407(b)(3)	RSS-247, 5.5 RSS-GEN, 8.9, 10	Spurious Emission, Band Edge and Restricted bands	5.5	C
15.407(g)	RSS-GEN, 6.11	Frequency Stability	5.6	C
15.207(a)	RSS-GEN, 8.8	Conducted Emissions	5.7	C
15.407(h)	RSS-247, 6.3	Dynamic Frequency Selection	5.8	C
Note: C = complies, NC = Not complies, NT = Not tested, NA = Not Applicable				

Note: 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 ㎒ ~ 300 ㎒:	+4.94 dB, -5.06 dB
		+4.93 dB, -5.05 dB
	300 ㎒ ~ 1 000 ㎒:	+4.97 dB, -5.08 dB
		+4.84 dB, -4.96 dB
	1 ㎓ ~ 25 ㎓:	+6.03 dB, -6.05 dB
Conducted Emissions	9 ㎑ ~ 150 ㎑:	3.75 dB
	150 ㎑ ~ 30 ㎒:	3.36 dB

5. Test results

5.1 Antenna Requirement

5.1.1 Regulation

5.1.1.1 Regulation for FCC

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 §15.407(a)(1)(2)(3), If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.1.1.2 Regulation for IC

According to § RSS GEN Issue 4, 6.2, As per RSP-100, each applicant for equipment certification must provide a list of all antenna types that may be used with the transmitter, indicating the maximum permissible antenna gain (in dBi).
When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements, including the antenna type used.
In addition, applicants shall perform RF power and spurious emission measurements with each antenna type supplied or specified by the manufacturer for use with the transmitter.

5.1.2 Result

-Complied

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

5.2 Maximum Conducted Output Power

5.2.1 Regulation

5.2.1.1 Regulation for FCC

According to §15.407(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 ㎓, the maximumConducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 17 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to §15.407(a) (2) For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈that the directional gain of the antenna exceeds 6 ㏈i.

According to §15.407(a) (3) For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2.1.2 Regulation for IC

According to §RSS-247, 6.2.1 (1), Frequency Band 5 150-5 250 ㎒.

(1) Power limits, The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, ㏈m, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 ㏈m in any 1.0 ㎒ band.

According to §RSS-247, 6.2.2 (1), Frequency Band 5 250-5 350 ㎒.

(1) Power limits, The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, ㏈m, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to §RSS-247, 6.2.3 (1), Frequency Band 54 70-5 600 ㎒ and 5 650-5 725 ㎒.

(1) Power limits The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, ㏈m, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

According to §RSS-247, 6.2.4 (1), Frequency Band 5 250-5 350 ㎒.

(1) Power limits For equipment operating in the band 5 725-5 850 ㎒, the minimum 6 ㏈ bandwidth shall be at least 500 ㎑.

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 ㏈m in any 500 ㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

5.2.2 Measurement Procedure

These test measurement settings are specified in section C of 789033 D02 General UNII Test Procedures.

5.2.2.1 Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):

(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 ㎒.

(iii) Set VBW ≥ 3 ㎒.

(iv) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must 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.”

(viii) Trace average at least 100 traces in power averaging (rms) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 ㎒ intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

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

(i) Measure the duty cycle, x, of the transmitter output signal as described in section II.B.

(ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(iii) Set RBW = 1 ㎒.

(iv) Set VBW ≥ 3 ㎒.

(v) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(vi) Sweep time = auto.

(vii) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.

(viii) Do not use sweep triggering. Allow the sweep to “free run.”

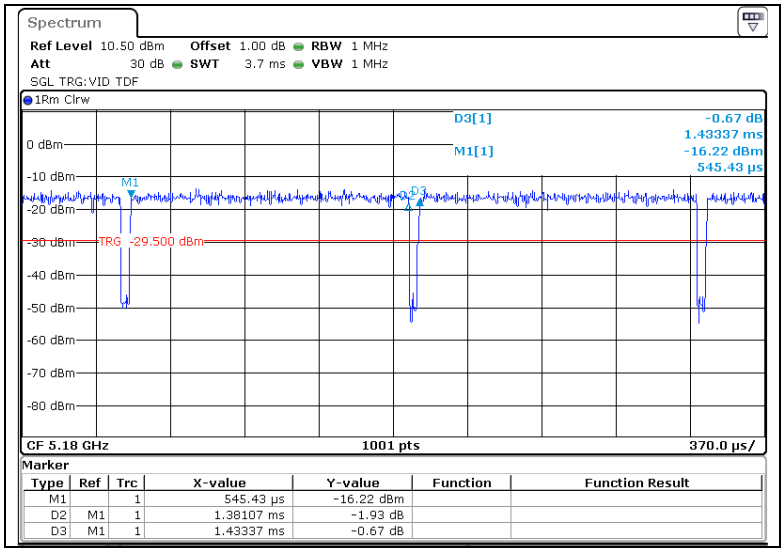
(ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.

(x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 ㎒ intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(xi) 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

- 802.11a



-On time : 1.38 ㎳

-Period : 1.43 ㎳

-Duty Cycle : 0.963 5

-D.C.C.F : 0.16 ㏈

5.2.3 Test Result

-Complied

- 5 150 Band

-802.11a

Frequency [㎒]	Result [dBm]	D.C.C.F [dB]	Limit (FCC/IC) [dBm]	Margin (FCC/IC) [dB]
5 180	-3.58	0.16	24.00 / 23.00	27.42 / 26.42
5 200	-4.19	0.16	24.00 / 23.00	28.03 / 27.03
5 240	-5.19	0.16	24.00 / 23.00	29.03 / 28.03

- 5 250 Band

-802.11a

Frequency [㎒]	Result [dBm]	D.C.C.F [dB]	Limit [dBm]	Margin [dB]
5 260	-5.47	0.16	24.00	29.31
5 300	-5.83	0.16	24.00	29.67
5 320	-6.28	0.16	24.00	30.12

- 5 470 Band

-802.11a

Frequency [㎒]	Result [dBm]	D.C.C.F [dB]	Limit [dBm]	Margin [dB]
5 500	-6.54	0.16	24.00	30.38
5 580	-7.97	0.16	24.00	31.81
5 700	-8.96	0.16	24.00	32.80

- 5 725 Band

-802.11a

Frequency [㎒]	Result [dBm]	D.C.C.F [dB]	Limit [dBm]	Margin [dB]
5 745	-7.52	0.16	30.00	37.36
5 785	-7.18	0.16	30.00	37.02
5 825	-6.87	0.16	30.00	36.71

Note:
1. D.C.C.F = Duty cycle correction factor = 10log(1/Duty Cycle)
2. It was measured by power sensor.

5.3 Bandwidth Measurement

5.3.1 Regulation

5.3.1.1 Regulation for FCC

According to §15.403,(i) Emission bandwidth. For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 ㏈ down relative to the maximum level of the modulated carrier.
Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

According to §15.407,(e) Within the 5.725-5.85 ㎓ band, the minimum 6 ㏈ bandwidth of U-NII devices shall be at least 500 ㎑.

5.3.1.2 Regulation for IC

- **Occupied Bandwidth**

According to § RSS GEN Issue 4, 6.6, The emission bandwidth (x dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated x dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth. When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

5.3.2 Measurement Procedure

1.Emission Bandwidth (EBW)

a)Set RBW = approximately 1% of the emission bandwidth.
b)Set the VBW > RBW.
c)Detector = Peak.
d)Trace mode = max hold.
e)Measure the maximum width of the emission that is 26 ㏈ down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeatmeasurement as needed until the RBW/EBW ratio is approximately 1%.

2.Minimum Emission Bandwidth for the band 5.725 - 5.85 ㎓

Section 15.407(e) specifies the minimum 6 ㏈ emission bandwidth of at least 500 ㎑ for theband 5.715-5.85 ㎓. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 ㎑.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associatedwith the two outermost amplitude points (upper and lower frequencies) that are attenuated by6 ㏈ relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

5.3.3 Test Result

-Complied

- 5 150 Band

- 802.11a

Frequency [㎒]	26 ㏈ Bandwidth [㎒]	OBW [㎒]
5 180	18.70	16.70
5 200	18.58	16.70
5 240	18.58	16.50

- 5 250 Band

- 802.11a

Frequency [㎒]	26 ㏈ Bandwidth [㎒]	OBW [㎒]
5 260	18.54	16.54
5 300	18.70	16.66
5 320	18.50	16.54

- 5 470 Band

- 802.11a

Frequency [㎒]	26 ㏈ Bandwidth [㎒]	OBW [㎒]
5 500	18.58	16.58
5 580	18.62	16.54
5 700	18.86	16.62

- 5 725 Band

- 802.11a

Frequency [㎒]	6 ㏈ Bandwidth [㎒]	OBW [㎒]
5 745	15.19	16.78
5 785	15.19	16.86
5 825	15.19	17.14

5.3.4 Test Plot

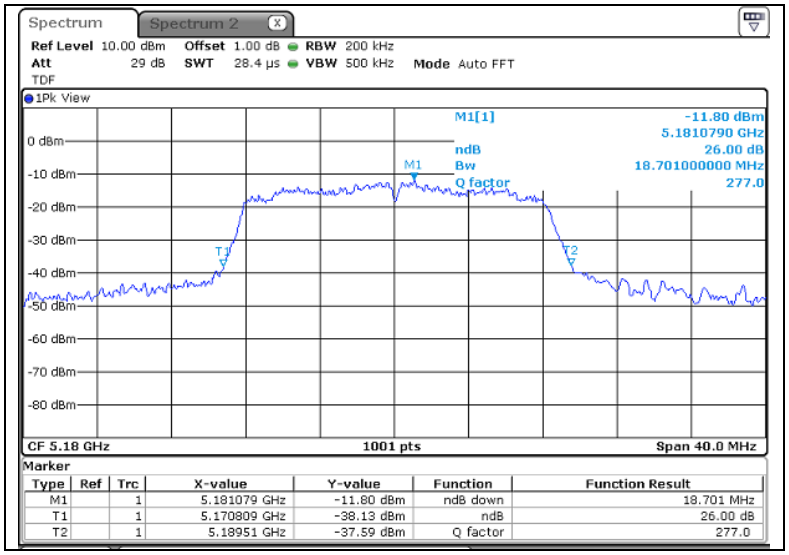
Figure 1. Plot of Bandwidth Measurement

- 5 150 Band

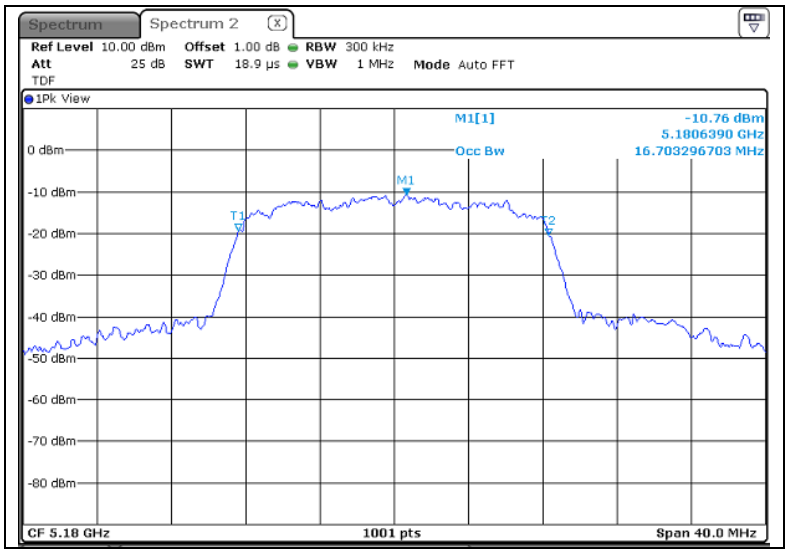
- 802.11a

- 5 180 ㎒

EBW

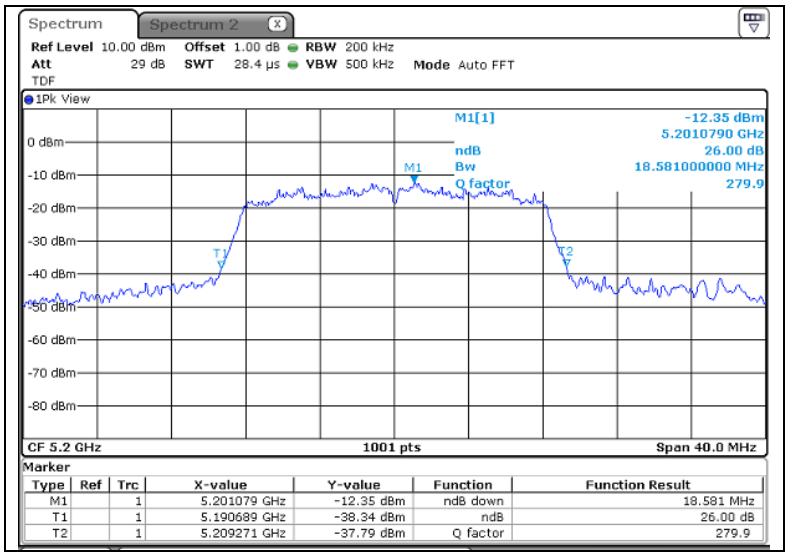


OBW



- 5 200 ㎒

EBW


Spectrum
Spectrum 2
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TDF
1Pk View
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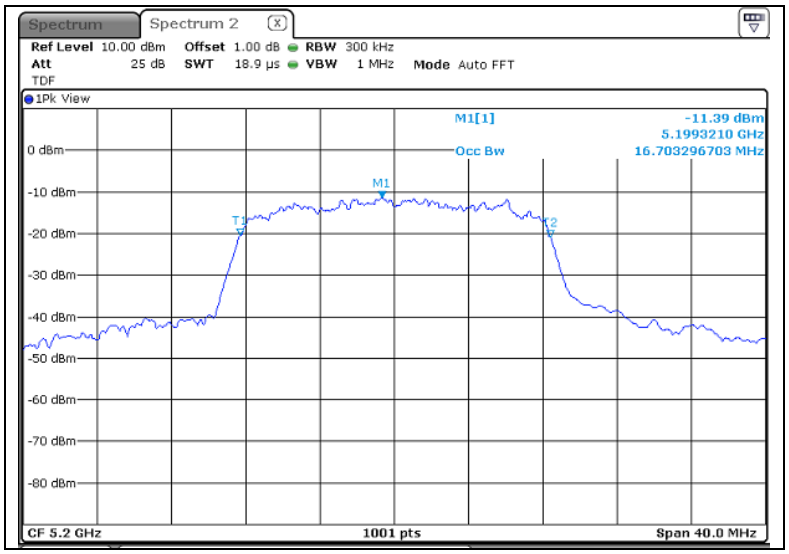
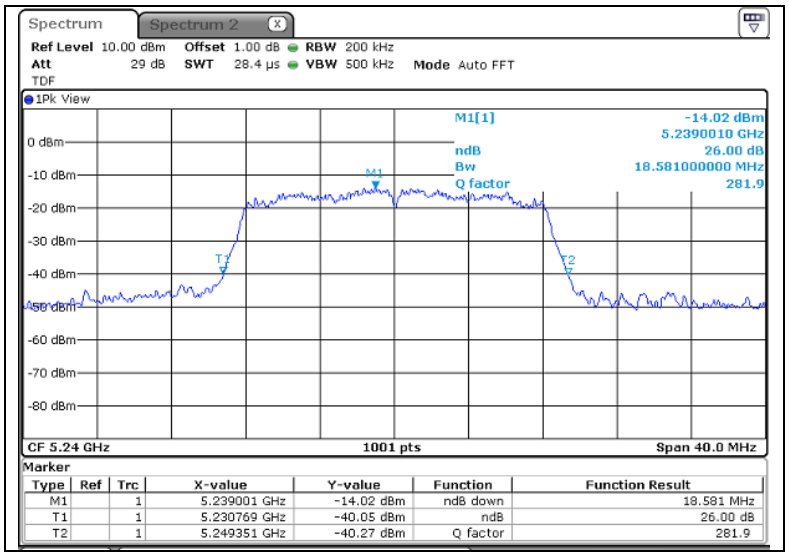
5.2010790 GHz
ndB 26.00 dB
Bw 18.581000000 MHz
Q factor 279.9
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.2 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.201079 GHz -12.35 dBm ndB down 18.581 MHz
T1 1 5.190689 GHz -38.34 dBm ndB 26.00 dB
T2 1 5.209271 GHz -37.79 dBm Q factor 279.9

OBW

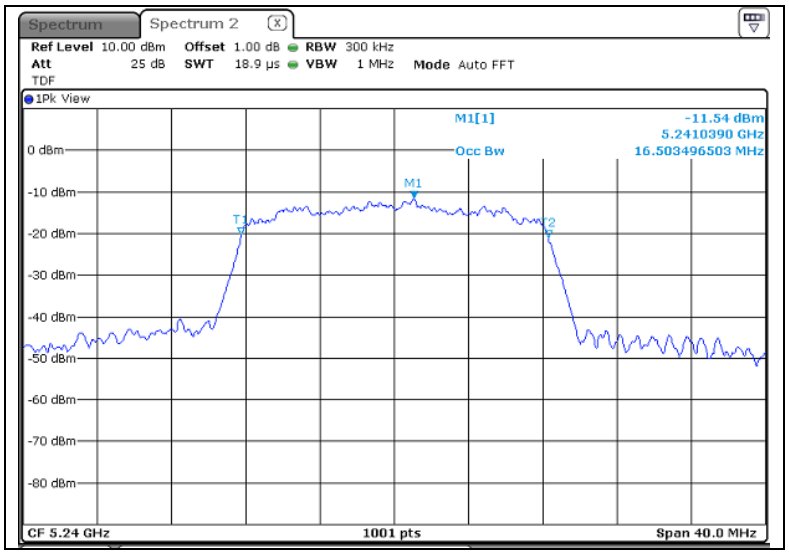

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -11.39 dBm
5.1993210 GHz
Occ Bw 16.703296703 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.2 GHz
1001 pts
Span 40.0 MHz

- 5 240 ㎒

EBW


Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 200 kHz
Att 29 dB SWT 28.4 µs VBW 500 kHz Mode Auto FFT
TDF
1Pk View
M1[1] -14.02 dBm
5.2390010 GHz
ndB 26.00 dB
Bw 18.581000000 MHz
Q factor 281.9
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.24 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.239001 GHz -14.02 dBm ndB down 18.581 MHz
T1 1 5.230769 GHz -40.05 dBm ndB 26.00 dB
T2 1 5.249351 GHz -40.27 dBm Q factor 281.9

OBW

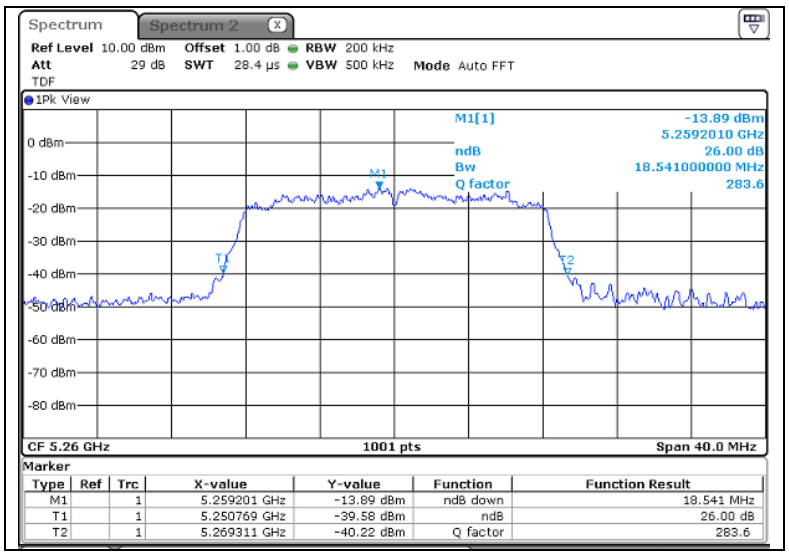

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -11.54 dBm
5.2410390 GHz
Occ Bw 16.503496503 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.24 GHz
1001 pts
Span 40.0 MHz

- 5 250 Band

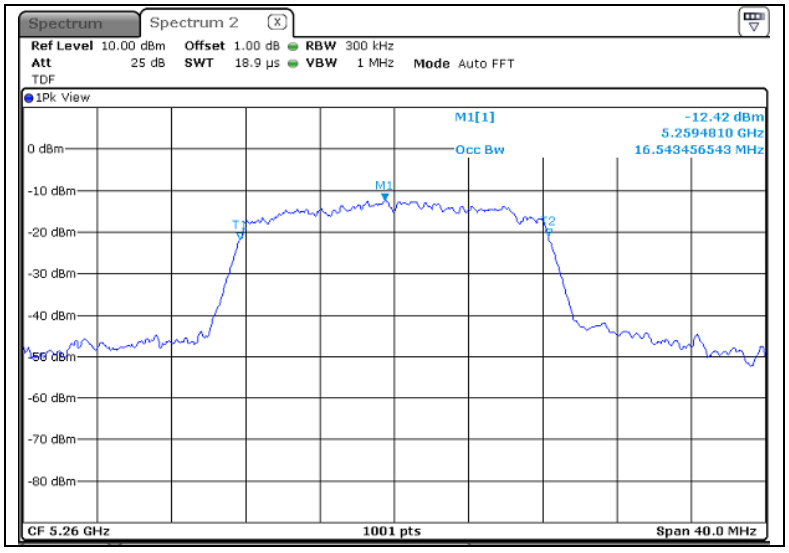
- 802.11a

- 5 260 ㎒

EBW

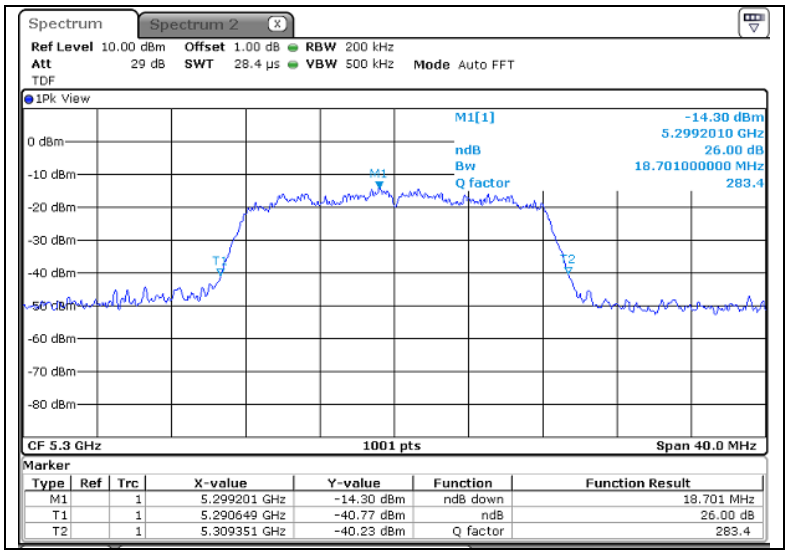


OBW

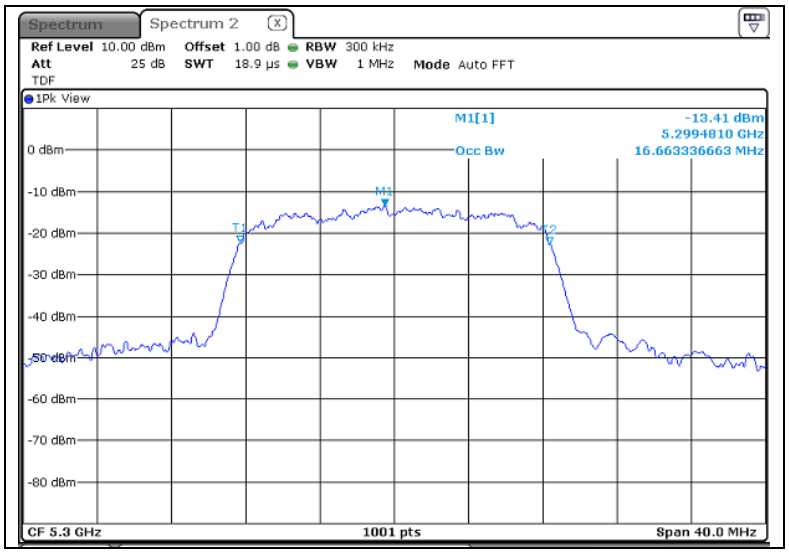


- 5 300 ㎒

EBW

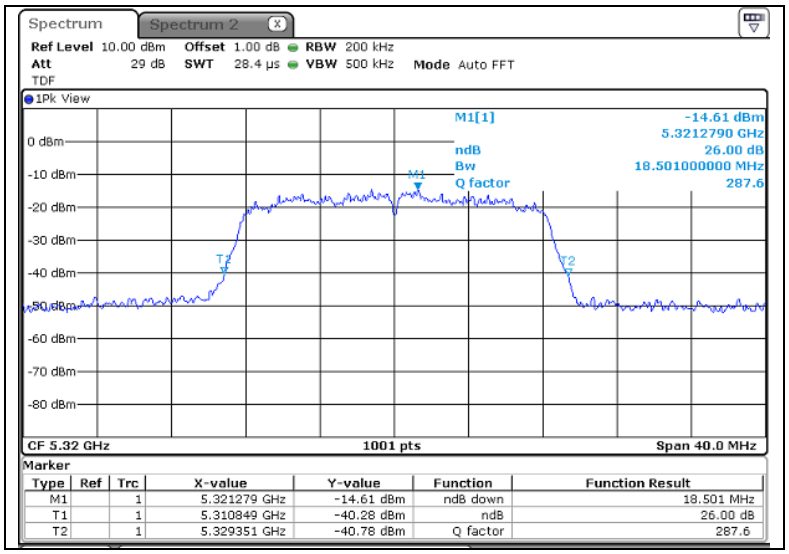

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 200 kHz
Att 29 dB SWT 28.4 µs VBW 500 kHz Mode Auto FFT
TDF
1Pk View
M1[1] -14.30 dBm
5.2992010 GHz
ndB 26.00 dB
Bw 18.701000000 MHz
Q factor 283.4
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.3 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.299201 GHz -14.30 dBm ndB down 18.701 MHz
T1 1 5.290649 GHz -40.77 dBm ndB 26.00 dB
T2 1 5.309351 GHz -40.23 dBm Q factor 283.4

OBW

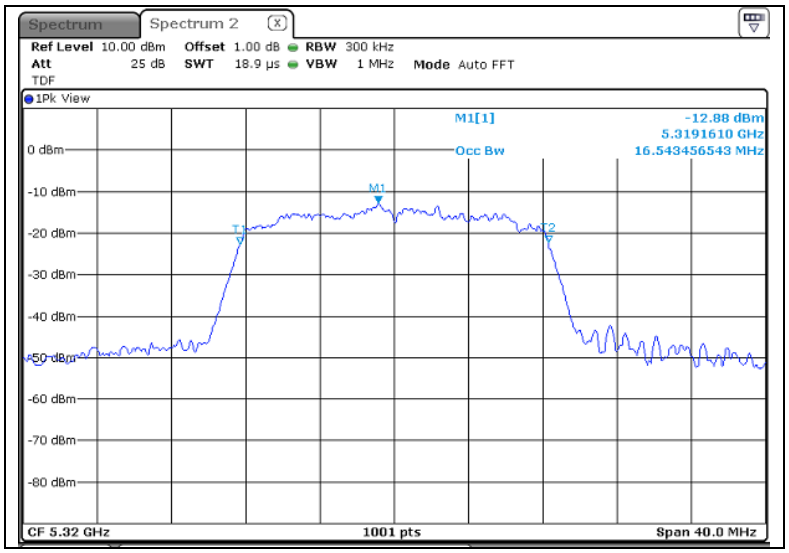

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -13.41 dBm
5.2994810 GHz
Occ Bw 16.663336663 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.3 GHz
1001 pts
Span 40.0 MHz

- 5 320 ㎒

EBW


Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 200 kHz
Att 29 dB SWT 28.4 µs VBW 500 kHz Mode Auto FFT
TDF
1Pk View
M1[1] -14.61 dBm
5.3212790 GHz
ndB 26.00 dB
Bw 18.501000000 MHz
Q factor 287.6
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.32 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.321279 GHz -14.61 dBm ndB down 18.501 MHz
T1 1 5.310849 GHz -40.28 dBm ndB 26.00 dB
T2 1 5.329351 GHz -40.78 dBm Q factor 287.6

OBW

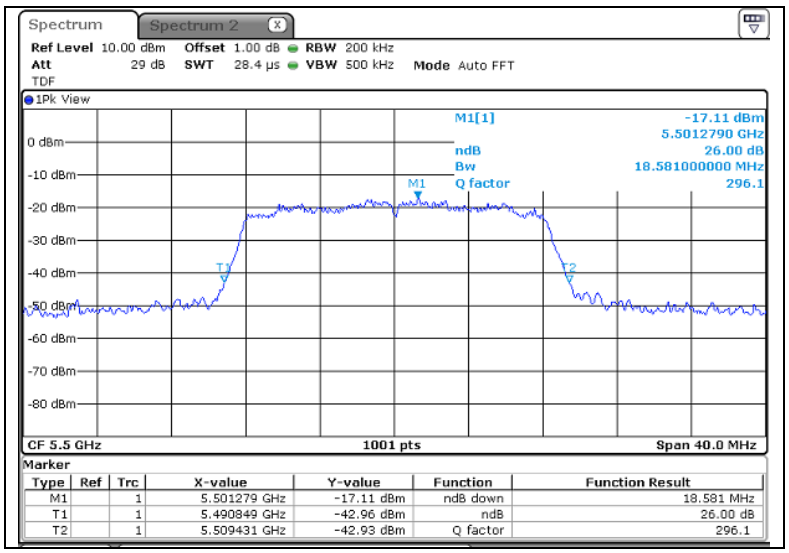

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -12.88 dBm
5.3191610 GHz
Occ Bw 16.543456543 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.32 GHz
1001 pts
Span 40.0 MHz

- 5 470 Band

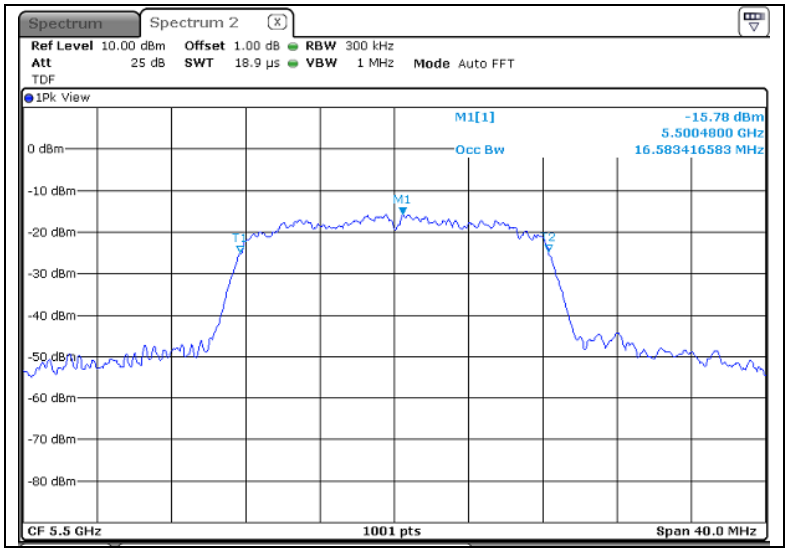
- 802.11a

- 5 500 ㎒

EBW

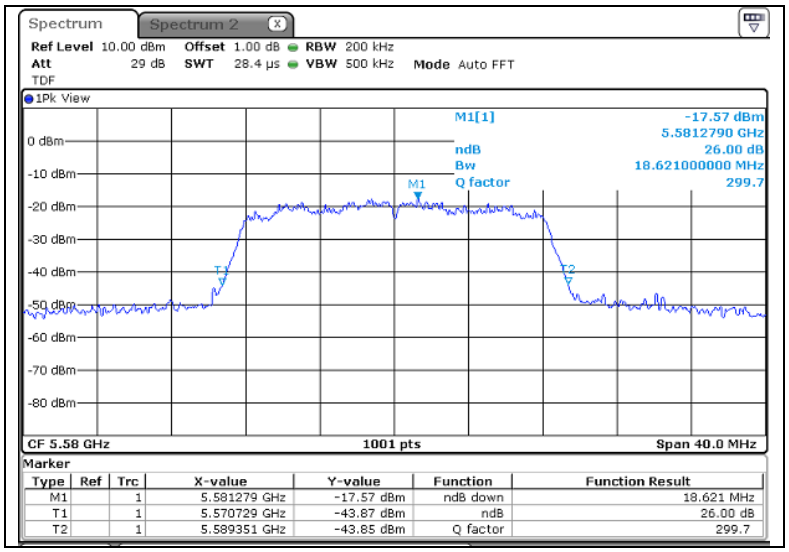


OBW

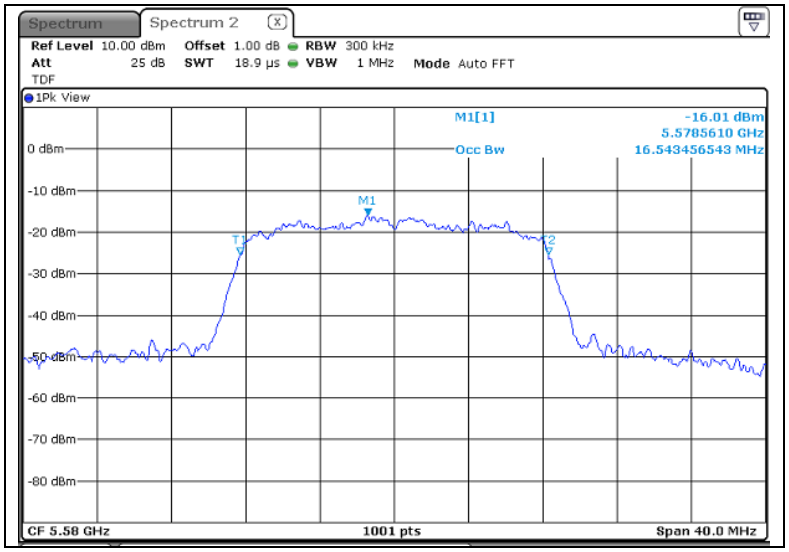


- 5 580 ㎒

EBW

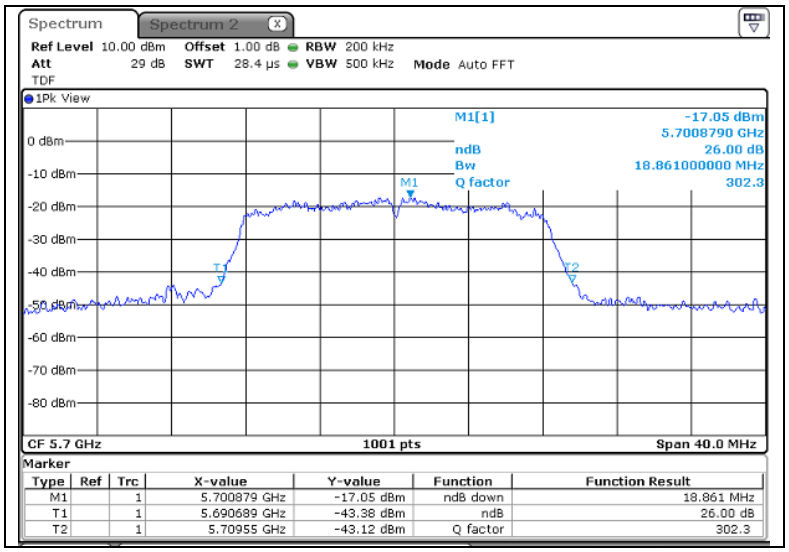

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 200 kHz
Att 29 dB SWT 28.4 µs VBW 500 kHz Mode Auto FFT
TDF
1Pk View
M1[1] -17.57 dBm
5.5812790 GHz
ndB 26.00 dB
Bw 18.621000000 MHz
Q factor 299.7
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.58 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.581279 GHz -17.57 dBm ndB down 18.621 MHz
T1 1 5.570729 GHz -43.87 dBm ndB 26.00 dB
T2 1 5.589351 GHz -43.85 dBm Q factor 299.7

OBW

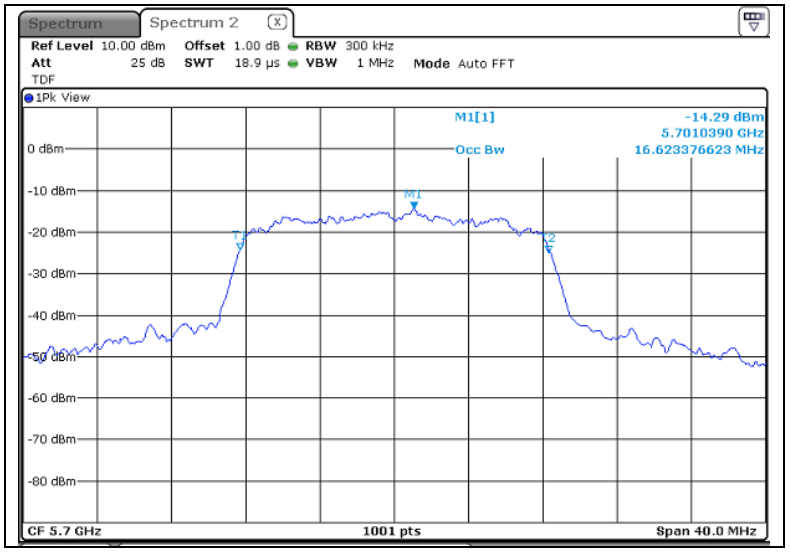

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -16.01 dBm
5.5785610 GHz
Occ Bw 16.543456543 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.58 GHz
1001 pts
Span 40.0 MHz

- 5 700 ㎒

EBW


Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 200 kHz
Att 29 dB SWT 28.4 µs VBW 500 kHz Mode Auto FFT
TDF
1Pk View
M1[1] -17.05 dBm
5.7008790 GHz
ndB 26.00 dB
Bw 18.861000000 MHz
Q factor 302.3
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.7 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.700879 GHz -17.05 dBm ndB down 18.861 MHz
T1 1 5.690689 GHz -43.38 dBm ndB 26.00 dB
T2 1 5.70955 GHz -43.12 dBm Q factor 302.3

OBW

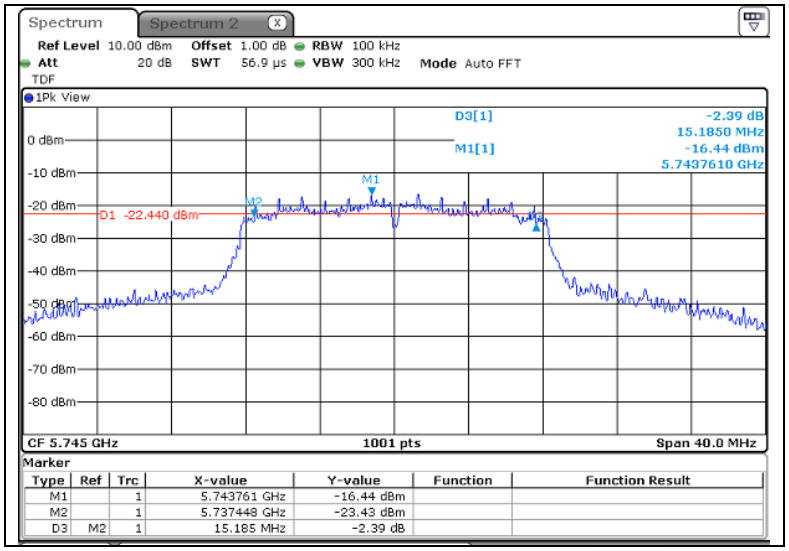

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -14.29 dBm
5.7010390 GHz
Occ Bw 16.623376623 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 5.7 GHz
1001 pts
Span 40.0 MHz

- 5 725 Band

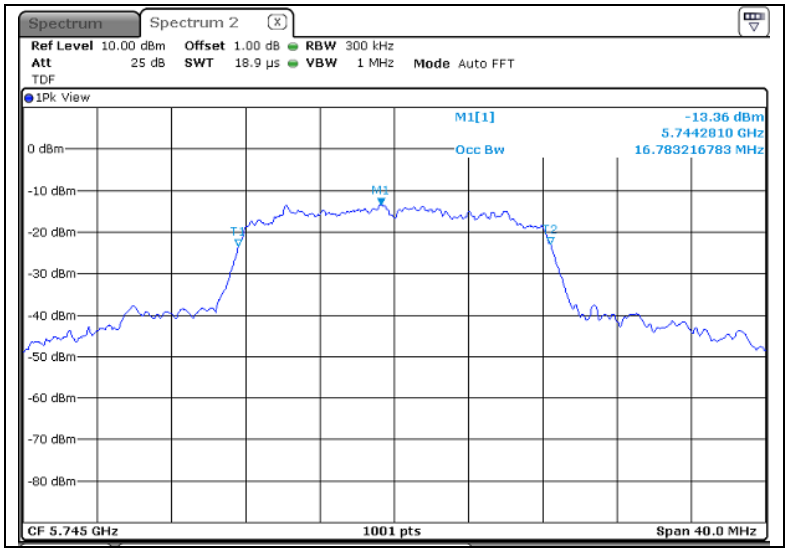
- 802.11a

- 5 745 ㎒

EBW

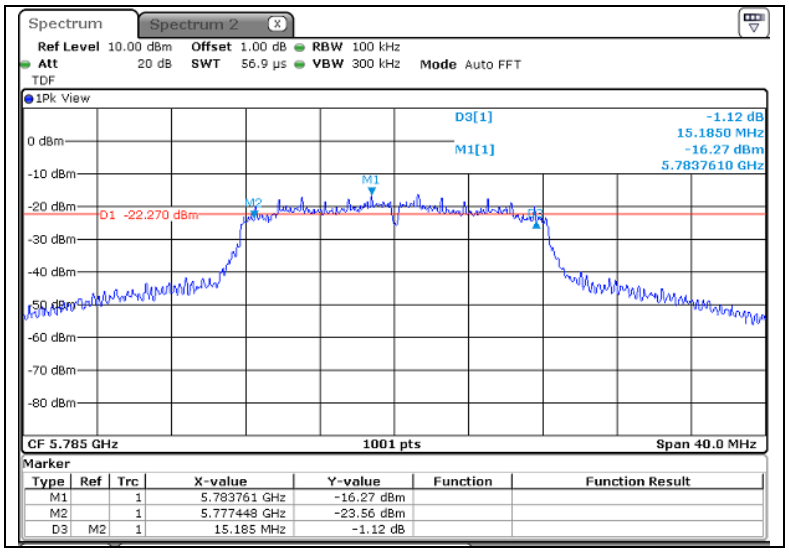


OBW

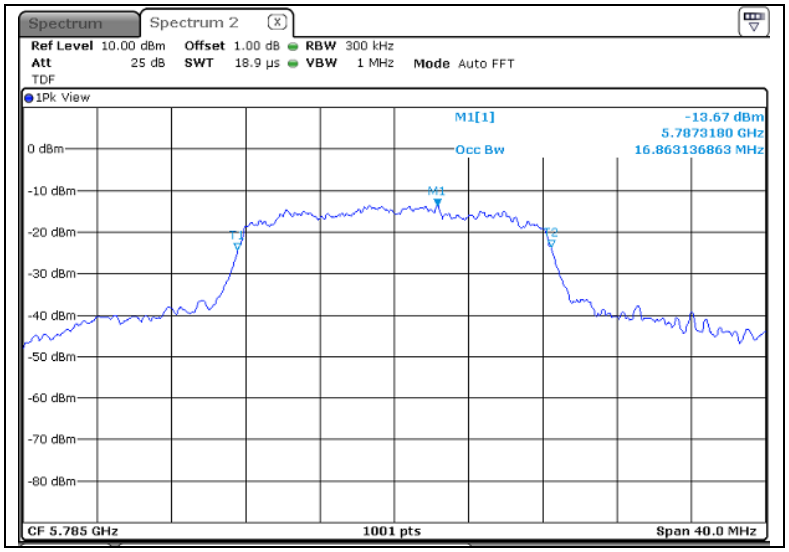


- 5 785 ㎒

EBW

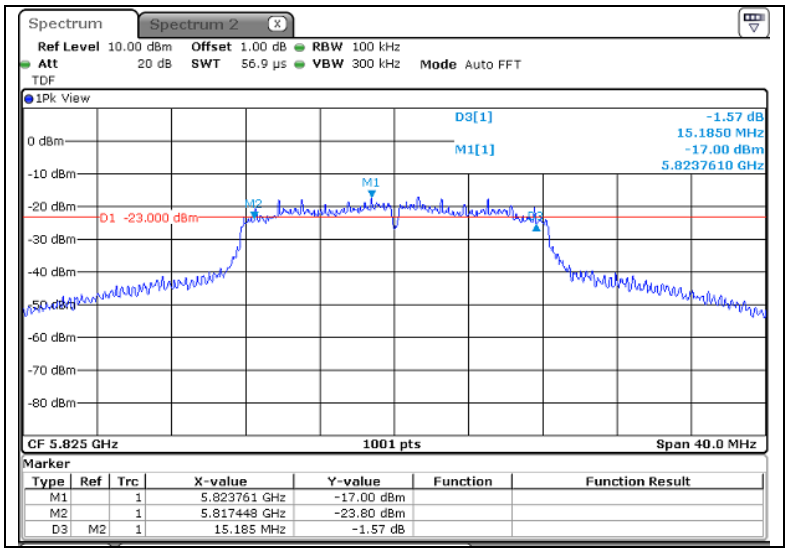

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
TDF
1Pk View
D3[1] -1.12 dB
15.1850 MHz
M1[1] -16.27 dBm
5.7837610 GHz
D1 -22.270 dBm
CF 5.785 GHz
1001 pts
Span 40.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 5.783761 GHz -16.27 dBm
M2 1 5.777448 GHz -23.56 dBm
D3 M2 1 15.185 MHz -1.12 dB

OBW

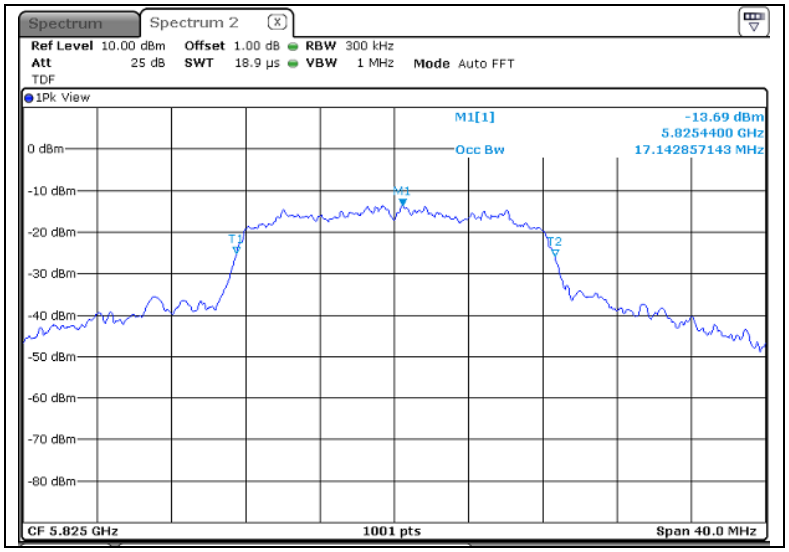

Spectrum
Spectrum 2
Ref Level 10.00 dBm Offset 1.00 dB RBW 300 kHz
Att 25 dB SWT 18.9 µs VBW 1 MHz Mode Auto FFT
TDF
1Pk View
M1[1] -13.67 dBm
5.7873180 GHz
Occ Bw 16.863136863 MHz
CF 5.785 GHz
1001 pts
Span 40.0 MHz

- 5 825 MHz

EBW



OBW



5.4 Peak Power Spectral Density

5.4.1 Regulation

5.4.1.1 Regulation for FCC

According to §15.407(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 ㎓, the maximum Conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 17 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to §15.407(a) (2) For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ hat the directional gain of the antenna exceeds 6 ㏈i.

According to §15.407(a) (3) For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.4.1.2 Regulation for IC

According to §RSS-247, 6.2.1 (1), Frequency Band 5 150-5 250 ㎒.

(1) Power limits, The maximum e.i.r.p. shall not exceed 200 ㎽ or 10 + 10 log10B, ㏈m, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 ㎒ band.

According to §RSS-247, 6.2.2 (1), Frequency Band 5 250-5 350 ㎒.

(1) Power limits, The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 ㏈ below the maximum permitted e.i.r.p. of 1 W.

According to §RSS-247, 6.2.3 (1), Frequency Band 5 470-5 600 ㎒ and 5 650-5 725 ㎒.

(1) Power limits The maximum conducted output power shall not exceed 250 ㎽ or 11 + 10 log10B, ㏈m, whichever is less. The power spectral density shall not exceed 11 ㏈m in any 1.0 ㎒ band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, ㏈m, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 ㎽ shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

According to §RSS-247, 6.2.4 (1), Frequency Band 5 250-5 350 ㎒.

(1) Power limits For equipment operating in the band 5 725-5 850 ㎒, the minimum 6 ㏈ bandwidth shall be at least 500 ㎑.

The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 ㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

5.4.2 Measurement Procedure

These test measurement settings are specified in section F of 789033 D02 General UNII Test Procedures New Rules v01.

5.4.2.1 Maximum power spectral density (PSD)

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3. Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 ㏈ to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 ㎒ reference bandwidth.

5. For devices operating in the bands 5.15-5.25 ㎓, 5.25-5.35 ㎓, and 5.47-5.725 ㎓, the above procedures make use of 1 ㎒ RBW to satisfy directly the 1 ㎒ reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 ㎓, the rules specify a measurement bandwidth of 500 ㎑. Many spectrum analyzers do not have 500 ㎑ RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 ㎒, or 500 ㎑, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 ㎒, or 500 ㎑). If measurements are performed using a reduced resolution bandwidth (< 1 ㎒, or < 500 ㎑) and integrated over 1 ㎒, or 500 ㎑ bandwidth, the following adjustments to the procedures apply: a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).
c) Set VBW ≥ 3 RBW.
d) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10log(500㎑/RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
e) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10log(1㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
f) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 ㎑ for the sections 5.c) and 5.d) above, since RBW=100 ㎑ is available on nearly all spectrum analyzers.

5.4.3 Test Result

-Complied

- 5 150 Band

- 802.11a

Frequency [㎒]	Result [dBm/㎒]	D.C.C.F [dB]	Total result [dBm/㎒]	Limit [dBm]	Margin [dB]
5 180	-12.28	0.16	-12.12	11.00	23.12
5 200	-12.76	0.16	-12.60	11.00	23.60
5 240	-14.04	0.16	-13.88	11.00	24.88

- 5 250 Band

- 802.11a

Frequency [㎒]	Result [dBm/㎒]	D.C.C.F [dB]	Total result [dBm/㎒]	Limit [dBm]	Margin [dB]
5 260	-14.19	0.16	-14.03	11.00	25.03
5 300	-14.98	0.16	-14.82	11.00	25.82
5 320	-15.04	0.16	-14.88	11.00	25.88

- 5 470 Band

- 802.11a

Frequency [㎒]	Result [dBm/㎒]	D.C.C.F [dB]	Total result [dBm/㎒]	Limit [dBm]	Margin [dB]
5 500	-17.68	0.16	-17.52	11.00	28.52
5 580	-17.54	0.16	-17.38	11.00	28.38
5 700	-17.29	0.16	-17.13	11.00	28.13

- 5 725 Band

- 802.11a

Frequency [㎒]	Result [dBm/㎒]	D.C.C.F [dB]	Total result [dBm/㎒]	Limit [dBm]	Margin [dB]
5 745	-15.28	0.16	-15.12	30.00	45.12
5 785	-15.76	0.16	-15.60	30.00	45.60
5 825	-15.73	0.16	-15.57	30.00	45.57

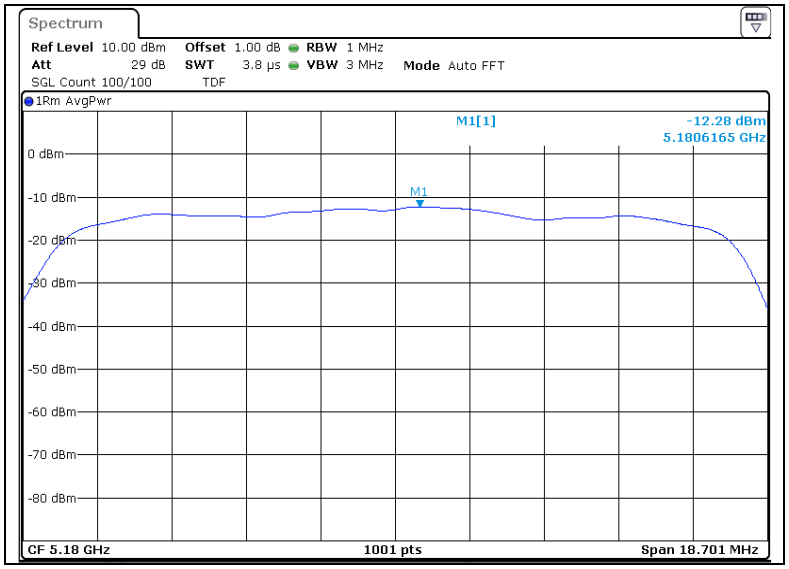
5.4.4 Test Plot

Figure 2. Plot of the Power Spectral Density

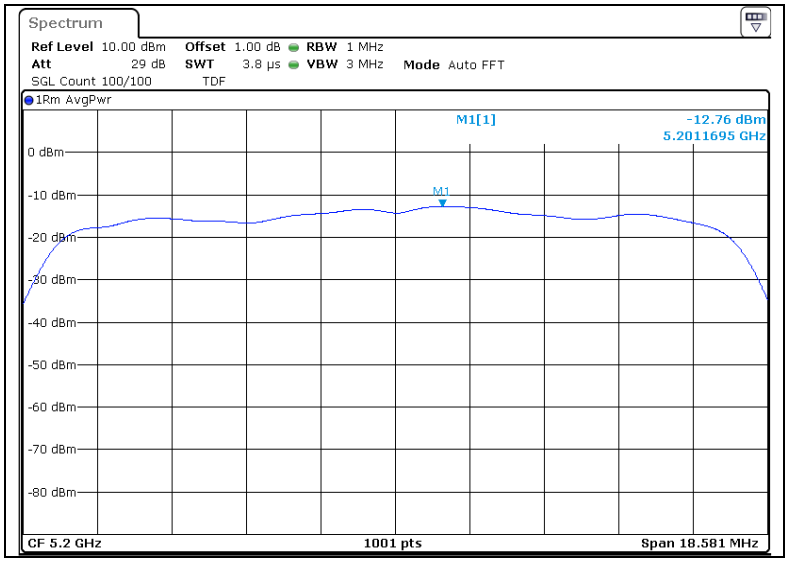
- 5 150 Band

- 802.11a

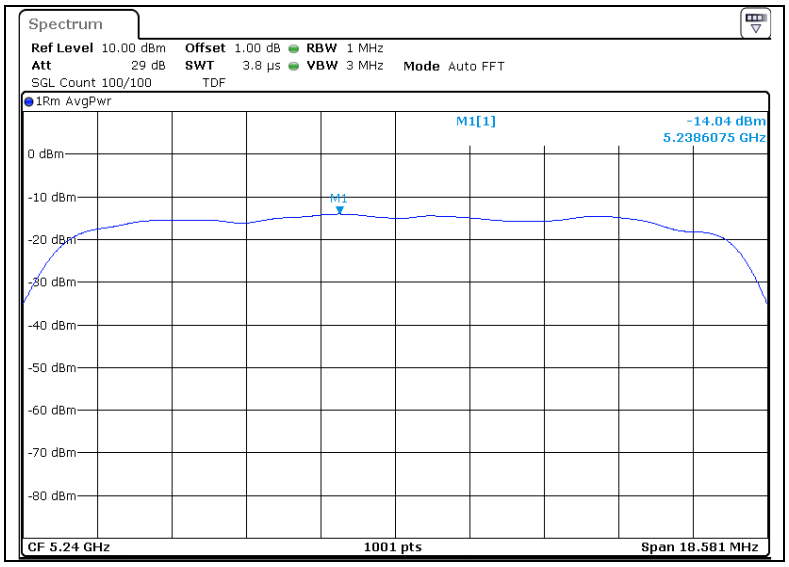
- 5 180 ㎒



- 5 200 ㎒



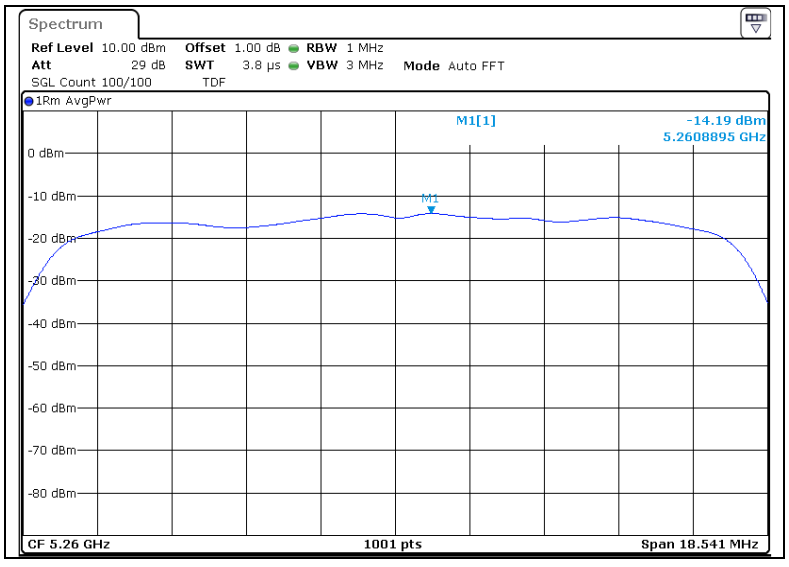
- 5 240 ㎒



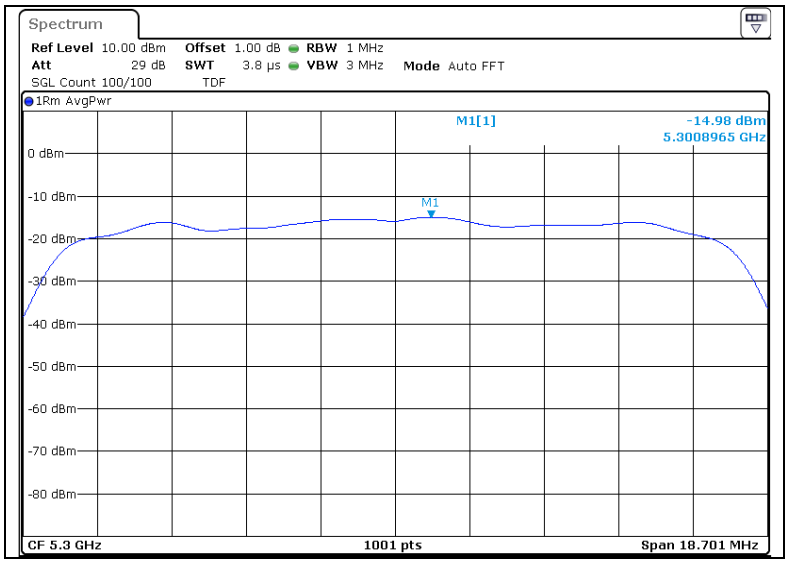
- 5 250 Band

- 802.11a

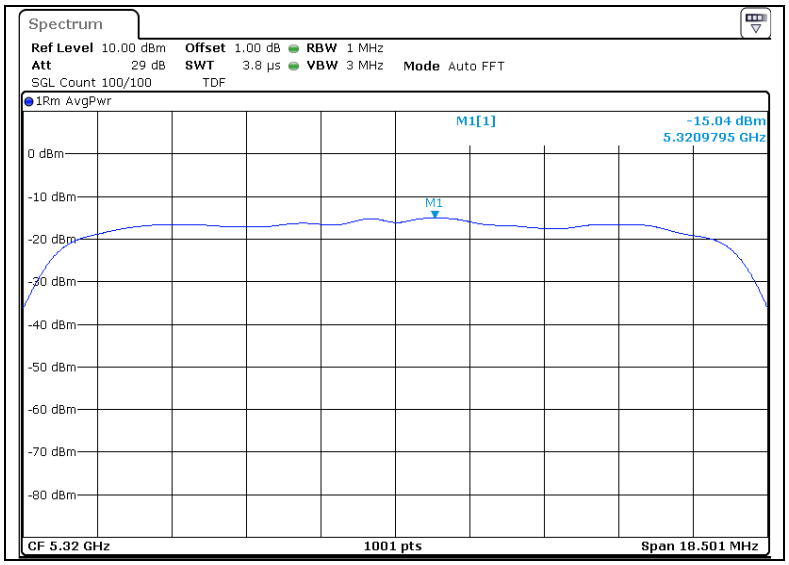
- 5 260 ㎒



- 5 300 ㎒



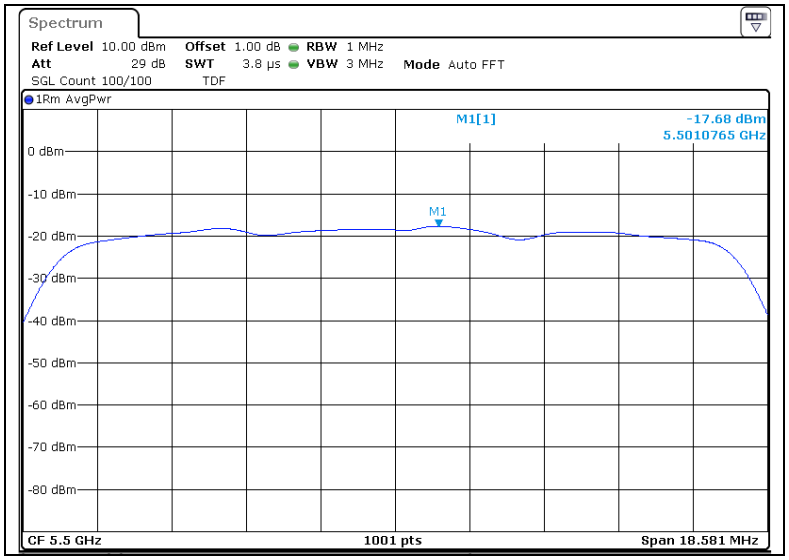
- 5 320 ㎒



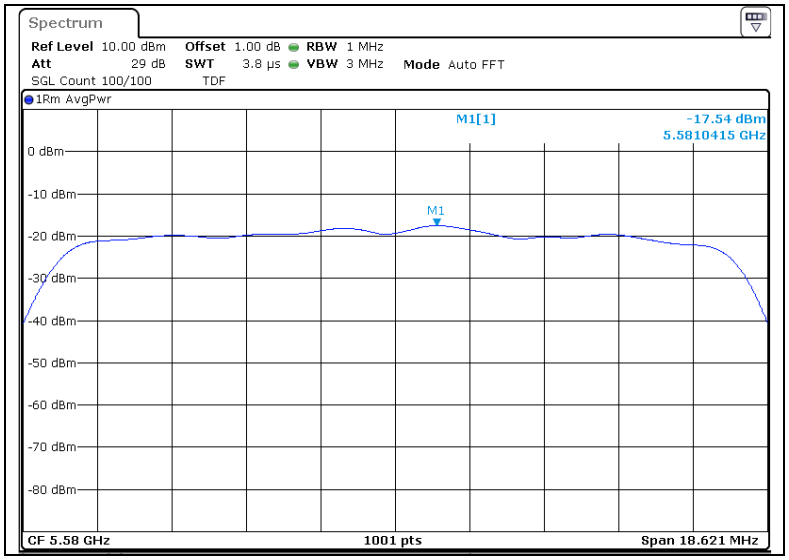
- 5 470 Band

- 802.11a

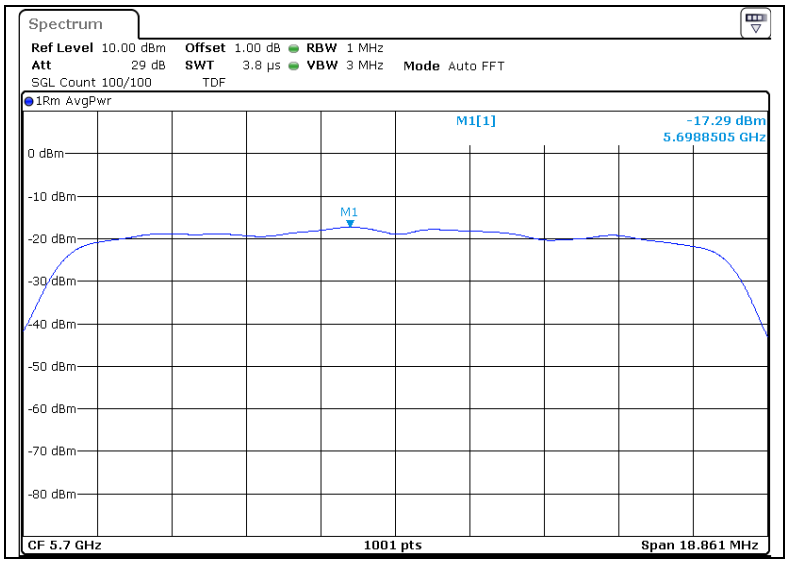
- 5 500 ㎒



- 5 580 ㎒



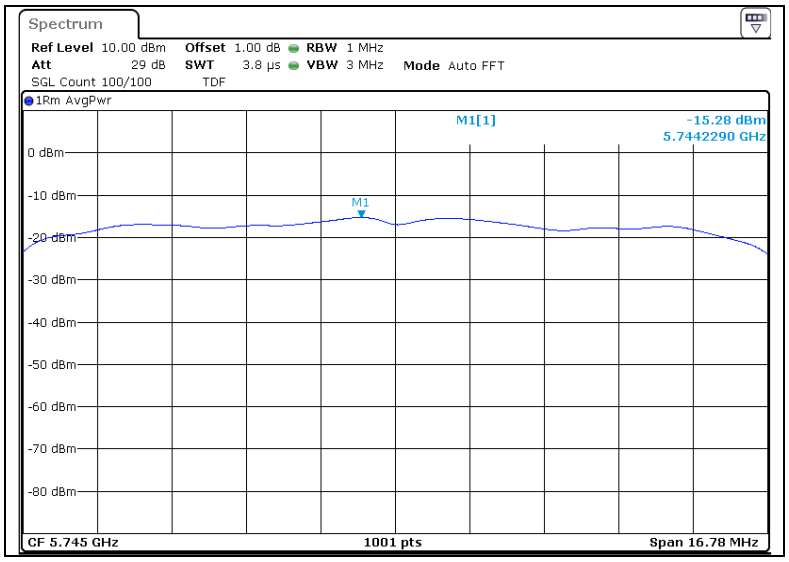
- 5 700 ㎒



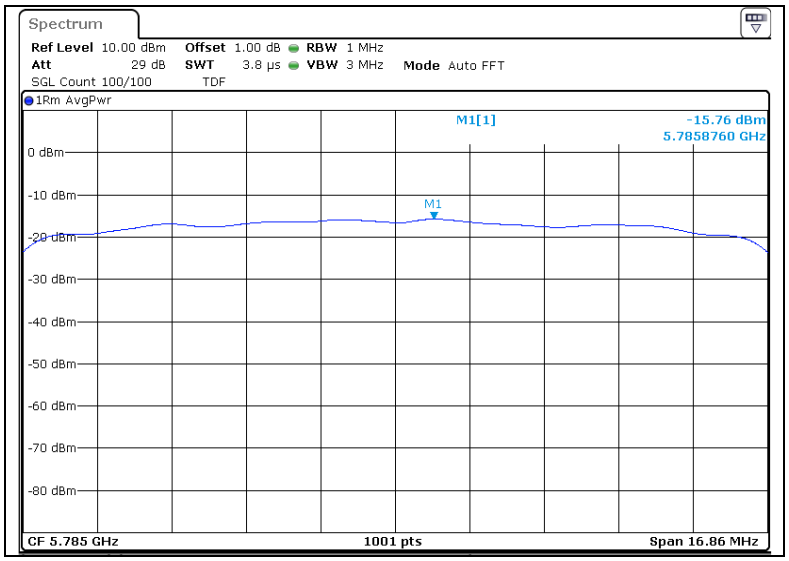
- 5 725 Band

- 802.11a

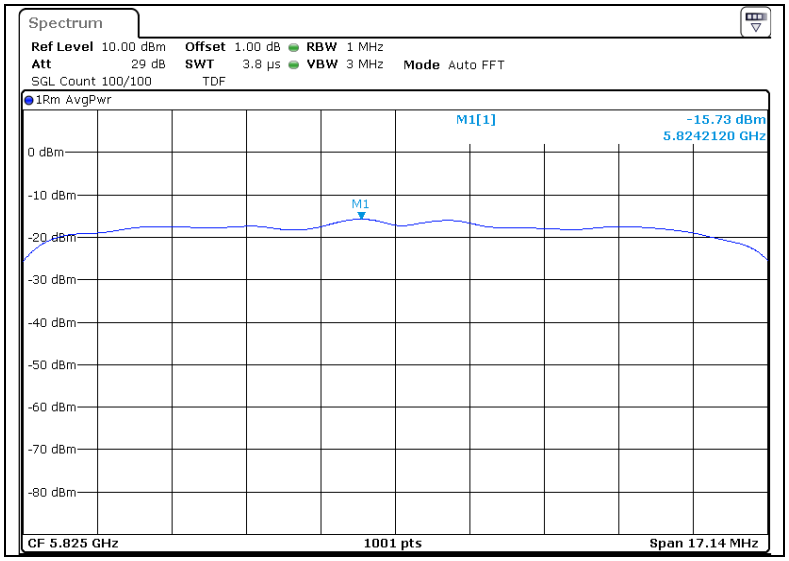
- 5 745 ㎒



- 5 785 ㎒



- 5 825 ㎒



5.5 Spurious Emission, Band Edge And Restricted Bands

5.5.1 Regulation

5.5.1.1 Regulation for FCC

According to §15.407(b)(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 EIRP of -27 ㏈m/㎒.

According to §15.407(b) (2) For transmitters operating in the 5.25-5.35 ㎓band: All emissions outside of the 5.15-5.35 ㎓band shall not exceed an e.i.r.p. of −27 ㏈m/㎒.

According to §15.407(b) For transmitters operating in the 5.47-5.725 ㎓band: All emissions outside of the 5.47-5.725 ㎓band shall not exceed an e.i.r.p. of −27 ㏈m/㎒.

According to §15.407(b) (4) (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.

According to §15.407(b)(6) Unwanted emissions below 1 ㎓ must comply with the general field strength limits set forth in §15.209.

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

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

** The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector and above 1000 ㎒ are based on the average value of measured emissions.

According to §15.407(b)(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 block edges as the design of the equipment permits.

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

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

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

5.5.1.2 Regulation for IC

According to §RSS-247, 6.2.1 (2), Frequency Band 5 150-5 250 ㎒.

(2) Unwanted emission limits, For transmitters operating in the band 5 150-5 250 ㎒, all emissions outside the band 5 150-5 350 ㎒ shall not exceed -27 dBm/㎒ e.i.r.p. However, any unwanted emissions that fall into the band 5 250- 5 350 ㎒ must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 ㎓. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5 250-5 350 ㎒.

According to §RSS-247, 6.2.2 (2), Frequency Band 5 250-5 350 ㎒.

(2) Unwanted emission limits,

i) For devices with both operating frequencies and channel bandwidths contained within the band 5 250-5 350 ㎒, the device shall comply with the following:
   a. All emissions outside the band 5 250-5 350 ㎒ shall not exceed -27 dBm/㎒ e.i.r.p. if the equipment is intended for outdoor use; or
   b. All emissions outside the band 5 150-5 350 ㎒ shall not exceed -27 dBm/㎒ e.i.r.p. and any emissions within the band 5 150-5 250 ㎒ shall meet the power spectral density limits of Section 6.2.1. The device shall be labelled “for indoor use only.”

ii) For devices with operating frequencies in the band 5 250-5 350 ㎒ but having a channel bandwidth that overlaps the band 5 150-5 250 ㎒, the devices’ unwanted emission shall not exceed -27 dBm/㎒ e.i.r.p. outside the band 5 150-5 350 ㎒ and its power shall comply with the spectral power density for operation within the band 5 150-5 250 ㎒. The device shall be labelled “for indoor use only.”

According to §RSS-247, 6.2.3 (2), Frequency Band 5 470-5 600 ㎒ and 5 650-5 725 ㎒.

(2) Unwanted emission limits, Emissions outside the band 5 470-5 725 ㎒ shall not exceed -27 dBm/㎒ e.i.r.p.

According to §RSS-247, 6.2.4 (2), Frequency Band 5 250-5 350 ㎒.

(2) Unwanted emission limits, For the band 5 725-5 850 ㎒, emissions at frequencies from the band edges to 10 ㎒ above or below the band edges shall not exceed -17 dBm/㎒ e.i.r.p. For emissions at frequencies more than 10 ㎒ above or below the band edges, the emissions power shall not exceed -27 dBm/㎒.

According to § RSS GEN Issue 4, 8.9, Except when the requirements applicable to a given device State otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 and Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz

Frequency (㎒)	Field Strength (μv/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 ㎓, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 ㏈ above the average limit.

Table 5 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Below 30 ㎒

Frequency	Electric Field Strength (㎶/m)	Magnetic Field Strength (H-Field) (㎂/m)	Measurement Distance (metres)
9-490 ㎑	2,400/F (F in ㎑)	2,400/377F (F in ㎑)	300
490-1,705 ㎑	24,000/F (F in ㎑)	24,000/377F (F in ㎑)	30
1,705-30 ㎒	30	N/A	30

According to § RSS GEN Issue 4, 8.10, Restricted bands, identified in Table 6, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

(a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 6 except for apparatus complying under RSS-287;
(b) Unwanted emissions that fall into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen; and
(c) Unwanted emissions that do not fall within the restricted frequency bands of Table 6 shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

Table 6 – Restricted Frequency Bands*

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

* Certain frequency bands listed in Table 6 and in bands above 38.6 ㎓ are designated for licence exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300-series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

5.5.2 Measurement Procedure

These test measurement settings are specified in section G of 789033 D02 General UNII Test Procedures New Rules v01.
For all radiated emissions tests, measurements must correspond to the direction of maximum emission level for each measured emission (see ANSI C63.10 for guidance).

5.5.2.1 Unwanted Emission Measurement

5.5.2.1.1 1. Unwanted Emissions in the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”
b) At frequencies below 1 000 ㎒, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements Below 1 000 ㎒.”
c) At frequencies above 1 000 ㎒, measurements performed using the peak and average measurement procedures described in sections II.G.5. and II.G.6, respectively, must satisfy the respective peak and average limits. If all peak measurements satisfy the average limit, then average measurements are not required.
d) For conducted measurements above 1 000 ㎒, EIRP shall be computed as specified in section II.G.3.b) and then field strength shall be computed as follows (see KDB Publication 412172): (i) E[㏈㎶/m] = EIRP[㏈m] - 20 log (d[meters]) + 104.77, where E = field strength and d = distance at which field strength limit is specified in the rules; (ii) E[㏈㎶/m] = EIRP[㏈m] + 95.2, for d = 3 meters.
e) For conducted measurements below 1 000 ㎒, the field strength shall be computed as specified in d), above, and then an additional 4.7 ㏈ shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 ㎒ and 1 000 ㎒, or an additional 6 ㏈ shall be added for frequencies below 30 ㎒.

5.5.2.1.1 2. Unwanted Emissions that fall Outside of the Restricted Bands

a) For all measurements, follow the requirements in section II.G.3. “General Requirements for Unwanted Emissions Measurements.”

b) At frequencies below 1000 ㎒, use the procedure described in section II.G.4. “Procedure for Unwanted Emissions Measurements Below 1 000 ㎒.”

c) At frequencies above 1 000 ㎒, use the procedure for maximum emissions described in section II.G.5., “Procedure for Unwanted Maximum Unwanted Emissions Measurements Above 1 000 ㎒.”

(i) Section 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1 000 ㎒ that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/㎒. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 ㏈m/㎒ ㏈m/㎒ peak emission limit.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit.

d) If radiated measurements are performed, field strength is then converted to EIRP as follows:

(i) EIRP = ((E×d)^2) / 30 where:

- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

(ii) Working in ㏈ units, the above equation is equivalent to: EIRP[㏈m] = E[㏈㎶/m] + 20 log (d[meters]) - 104.77

(iii) Or, if d is 3 meters: EIRP[㏈m] = E[㏈㎶/m] - 95.2

5.5.2.2 Spurious Radiated Emissions:

1. The preliminary and final rdiated measurements were performed to determine the frequency producing the maximum emissions in at a 10m anechoic chamber. The EUT was tested at a distance 3 meters.
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360˚.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 ㎑ to 30 ㎒ using the loop antenna, and from 30 to 1000 ㎒ using the TRILOG broadband antenna, and from
   1 000 ㎒ to 40 000 ㎒ using the horn antenna.
4. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
5. The 0.8m height is measurement for below 1 ㎓ and 1.5m is for above 1 ㎓ measurement.

Note

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 ㎑ for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 ㎓.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 ㎒ for Peak detection and frequency above 1 ㎓.

5.5.3 Test Result

-complied

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

- Below 1 ㎓ data (Worst-case: 5 150 Band 802.11a)

802.11a_Lowest Channel (5 180 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 ㎒										
4.96	9	H	36.60	0.59	-32.69	19.70	-12.40	24.20	69.50	45.30
16.15	9	V	39.10	1.02	-32.67	19.45	-12.20	26.90	69.50	42.60
Above 20.00	Not Detected	-	-	-	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1 ㎓										
179.74	120	H	56.70	3.00	-32.49	9.59	-19.90	36.80	43.50	6.70
239.76	120	H	49.20	3.62	-32.49	12.47	-16.40	32.80	46.00	13.20
299.66	120	H	52.90	3.84	-32.53	13.59	-15.10	37.80	46.00	8.20
599.39	120	H	40.70	5.98	-32.87	19.29	-7.60	33.10	46.00	12.90
659.41	120	H	42.10	6.28	-32.86	19.48	-7.10	35.00	46.00	11.00
839.22	120	H	41.20	6.66	-32.41	21.35	-4.40	36.80	46.00	9.20
Above 900.00	Not Detected	-	-	-	-	-	-	-	-	-

NOTE 1. Factor = Cable loss + Amp gain + Antenna factor
NOTE 2. Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

- Above 1 ㎓ data

- 5 150 Band

802.11a_Lowest Channel (5 180 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	H	82.20	3.42	-62.93	28.91	-30.60	51.60	74.00	22.40
3 990.63	1 000	H	75.00	5.91	-62.34	32.63	-23.80	51.20	74.00	22.80
4 885.75 [1)]	1 000	H	67.20	6.50	-61.98	34.98	-20.50	46.70	74.00	27.30
8 281.06	1 000	H	62.50	8.08	-61.46	36.08	-17.30	45.20	74.00	28.80
15 806.37	1 000	V	58.00	11.79	-61.18	40.69	-8.70	49.30	74.00	24.70
20 334.75	1 000	H	46.90	13.10	-51.60	45.40	6.90	53.80	74.00	20.20
37 706.50	1 000	V	46.90	18.70	-54.40	44.90	9.20	56.10	74.00	17.90
Above 38 000.00	Not Detected									
Average DATA. Emissions above 1 ㎓										
1 197.31	1 000	H	71.00	3.42	-62.93	28.91	-30.60	40.40	54.00	13.60
3 990.63	1 000	H	64.60	5.91	-62.34	32.63	-23.80	40.80	54.00	13.20
4 885.75 [1)]	1 000	H	54.60	6.50	-61.98	34.98	-20.50	34.10	54.00	19.90
8 281.06	1 000	H	51.20	8.08	-61.46	36.08	-17.30	33.90	54.00	20.10
15 806.37	1 000	V	46.50	11.79	-61.18	40.69	-8.70	37.80	54.00	16.20
20 334.75	1 000	H	36.60	13.10	-51.60	45.40	6.90	43.50	54.00	10.50
37 706.50	1 000	V	35.50	18.70	-54.40	44.90	9.20	44.70	54.00	9.30
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-

[1)] Restricted band.

802.11a_Middle Channel (5 200 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	81.20	3.42	-62.93	28.91	-30.60	50.60	74.00	23.40
1 995.50	1 000	V	80.00	4.49	-62.71	30.92	-27.30	52.70	74.00	21.30
3 990.63	1 000	H	75.50	5.91	-62.34	32.63	-23.80	51.70	74.00	22.30
8 260.94	1 000	H	62.40	8.07	-61.46	36.09	-17.30	45.10	74.00	28.90
14 676.50	1 000	V	58.90	11.33	-61.25	39.42	-10.50	48.40	74.00	25.60
20 296.25	1 000	H	48.40	13.10	-51.50	45.30	6.90	55.30	74.00	18.70
37 195.00	1 000	V	45.40	18.80	-55.10	45.80	9.50	54.90	74.00	19.10
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	68.50	3.42	-62.93	28.91	-30.60	37.90	54.00	16.10
1 995.50	1 000	V	67.50	4.49	-62.71	30.92	-27.30	40.20	54.00	13.80
3 990.63	1 000	H	64.00	5.91	-62.34	32.63	-23.80	40.20	54.00	13.80
8 260.94	1 000	H	51.50	8.07	-61.46	36.09	-17.30	34.20	54.00	19.80
14 676.50	1 000	V	47.80	11.33	-61.25	39.42	-10.50	37.30	54.00	16.70
20 296.25	1 000	H	36.70	13.10	-51.50	45.30	6.90	43.60	54.00	10.40
37 195.00	1 000	V	34.70	18.80	-55.10	45.80	9.50	44.20	54.00	9.80
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-

802.11a_Highest Channel (5 240 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	78.60	3.42	-62.93	28.91	-30.60	48.00	74.00	26.00
1 995.50	1 000	V	78.20	4.49	-62.71	30.92	-27.30	50.90	74.00	23.10
3 990.63	1 000	H	75.80	5.91	-62.34	32.63	-23.80	52.00	74.00	22.00
9 362.06	1 000	V	61.30	8.59	-61.30	36.21	-16.50	44.80	74.00	29.20
16 091.00	1 000	H	57.80	11.87	-60.77	41.00	-7.90	49.90	74.00	24.10
19 050.50	1 000	H	48.10	12.80	-52.10	44.50	5.20	53.30	74.00	20.70
37 016.25	1 000	V	46.20	18.90	-55.20	46.10	9.80	56.00	74.00	18.00
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	68.40	3.42	-62.93	28.91	-30.60	37.80	54.00	16.20
1 995.50	1 000	V	63.80	4.49	-62.71	30.92	-27.30	36.50	54.00	17.50
3 990.63	1 000	H	66.00	5.91	-62.34	32.63	-23.80	42.20	54.00	11.80
9 362.06	1 000	V	50.80	8.59	-61.30	36.21	-16.50	34.30	54.00	19.70
16 091.00	1 000	H	47.10	11.87	-60.77	41.00	-7.90	39.20	54.00	14.80
19 050.50	1 000	H	36.70	12.80	-52.10	44.50	5.20	41.90	54.00	12.10
37 016.25	1 000	V	36.20	18.90	-55.20	46.10	9.80	46.00	54.00	8.00
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-

- 5 250 Band

802.11a_Lowest Channel (5 260 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	80.00	3.42	-62.93	28.91	-30.60	49.40	74.00	24.60
1 995.50	1 000	V	78.50	4.49	-62.71	30.92	-27.30	51.20	74.00	22.80
3 990.63	1 000	H	75.20	5.91	-62.34	32.63	-23.80	51.40	74.00	22.60
8 683.56	1 000	H	62.20	8.27	-61.26	35.89	-17.10	45.10	74.00	28.90
16 569.69	1 000	V	57.60	12.03	-60.50	41.57	-6.90	50.70	74.00	23.30
20 213.75	1 000	H	47.30	13.10	-51.60	45.20	6.70	54.00	74.00	20.00
38 509.50	1 000	V	45.30	18.40	-52.10	44.30	10.60	55.90	74.00	18.10
Above 39 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	68.70	3.42	-62.93	28.91	-30.60	38.10	54.00	15.90
1 995.50	1 000	V	65.30	4.49	-62.71	30.92	-27.30	38.00	54.00	16.00
3 990.63	1 000	H	65.20	5.91	-62.34	32.63	-23.80	41.40	54.00	12.60
8 683.56	1 000	H	50.60	8.27	-61.26	35.89	-17.10	33.50	54.00	20.50
16 569.69	1 000	V	46.30	12.03	-60.50	41.57	-6.90	39.40	54.00	14.60
20 213.75	1 000	H	36.40	13.10	-51.60	45.20	6.70	43.10	54.00	10.90
38 509.50	1 000	V	34.00	18.40	-52.10	44.30	10.60	44.60	54.00	9.40
Above 39 000.00	Not Detected		-	-	-	-	-	-	-	-

802.11a_Middle Channel (5 300 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	79.00	3.42	-62.93	28.91	-30.60	48.40	74.00	25.60
1 994.81	1 000	V	78.70	4.49	-62.71	30.92	-27.30	51.40	74.00	22.60
3 990.63	1 000	H	75.50	5.91	-62.34	32.63	-23.80	51.70	74.00	22.30
8 232.19	1 000	H	62.70	8.06	-61.47	36.11	-17.30	45.40	74.00	28.60
14 666.44	1 000	V	58.80	11.32	-61.23	39.41	-10.50	48.30	74.00	25.70
20 180.75	1 000	V	47.00	13.00	-51.50	45.20	6.70	53.70	74.00	20.30
37 076.75	1 000	H	47.40	18.90	-55.20	46.00	9.70	57.10	74.00	16.90
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	68.10	3.42	-62.93	28.91	-30.60	37.50	54.00	16.50
1 994.81	1 000	V	66.10	4.49	-62.71	30.92	-27.30	38.80	54.00	15.20
3 990.63	1 000	H	65.50	5.91	-62.34	32.63	-23.80	41.70	54.00	12.30
8 232.19	1 000	H	51.30	8.06	-61.47	36.11	-17.30	34.00	54.00	20.00
14 666.44	1 000	V	47.80	11.32	-61.23	39.41	-10.50	37.30	54.00	16.70
20 180.75	1 000	V	36.50	13.00	-51.50	45.20	6.70	43.20	54.00	10.80
37 076.75	1 000	H	35.80	18.90	-55.20	46.00	9.70	45.50	54.00	8.50
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-

802.11a_Highest Channel (5 320 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 995.50	1 000	V	78.70	4.49	-62.71	30.92	-27.30	51.40	74.00	22.60
3 990.63	1 000	H	75.90	5.91	-62.34	32.63	-23.80	52.10	74.00	21.90
5 373.88 [1)]	1 000	V	63.90	6.77	-62.87	35.30	-20.80	43.10	74.00	30.90
8 028.06	1 000	H	63.20	7.96	-61.37	36.21	-17.20	46.00	74.00	28.00
15 067.50	1 000	V	58.30	11.59	-61.30	39.91	-9.80	48.50	74.00	25.50
21 124.00	1 000	V	47.00	13.30	-51.70	46.10	7.70	54.70	74.00	19.30
37 426.00	1 000	V	46.40	18.80	-55.00	45.40	9.20	55.60	74.00	18.40
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
1 995.50	1 000	V	64.80	4.49	-62.71	30.92	-27.30	37.50	54.00	16.50
3 990.63	1 000	H	66.10	5.91	-62.34	32.63	-23.80	42.30	54.00	11.70
5 373.88 [1)]	1 000	V	52.40	6.77	-62.87	35.30	-20.80	31.60	54.00	22.40
8 028.06	1 000	H	51.10	7.96	-61.37	36.21	-17.20	33.90	54.00	20.10
15 067.50	1 000	V	47.80	11.59	-61.30	39.91	-9.80	38.00	54.00	16.00
21 124.00	1 000	V	35.90	13.30	-51.70	46.10	7.70	43.60	54.00	10.40
37 426.00	1 000	V	35.20	18.80	-55.00	45.40	9.20	44.40	54.00	9.60
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-

[1)] Restricted band.

- 5 470 Band

802.11a_Lowest Channel (5 500 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 994.81	1 000	V	78.80	4.49	-62.71	30.92	-27.30	51.50	68.20	16.70
3 990.63 [1)]	1 000	H	74.70	5.91	-62.34	32.63	-23.80	50.90	74.00	23.10
5 469.44 [2)]	1 000	V	62.60	6.82	-62.93	35.31	-20.80	41.80	68.20	26.40
8 475.12 [1)]	1 000	V	62.90	8.17	-61.46	35.99	-17.30	45.60	74.00	28.40
15 227.06	1 000	H	58.30	11.63	-61.21	40.08	-9.50	48.80	68.20	19.40
20 389.75	1 000	H	47.30	13.10	-51.60	45.50	7.00	54.30	68.20	13.90
38 064.00	1 000	H	46.40	18.60	-53.30	44.40	9.70	56.10	68.20	12.10
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63	1 000	H	66.30	5.91	-62.34	32.63	-23.80	42.50	54.00	11.50
8 475.12 [1)]	1 000	V	51.70	8.17	-61.46	35.99	-17.30	34.40	54.00	19.60
Above 9 000.00	Not Detected		-	-	-	-	-	-	-	-

[1)] Restricted band.
[2)] Band Edge.

802.11a_Middle Channel (5 580 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 196.63	1 000	V	79.40	3.42	-62.93	28.91	-30.60	48.80	68.20	19.40
1 996.19	1 000	V	78.60	4.49	-62.71	30.92	-27.30	51.30	68.20	16.90
3 990.63 [1)]	1 000	H	76.10	5.91	-62.34	32.63	-23.80	52.30	74.00	21.70
8 334.25 [1)]	1 000	H	62.00	8.11	-61.57	36.06	-17.40	44.60	74.00	29.40
15 053.12	1 000	V	59.20	11.58	-61.28	39.90	-9.80	49.40	68.20	18.80
19 683.00	1 000	V	47.70	12.90	-51.90	44.80	5.80	53.50	68.20	14.70
37 013.50	1 000	H	47.00	18.90	-55.20	46.10	9.80	56.80	68.20	11.40
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63 [1)]	1 000	H	65.70	5.91	-62.34	32.63	-23.80	41.90	54.00	12.10
8 334.25	1 000	H	51.50	8.11	-61.57	36.06	-17.40	34.10	54.00	19.90
Above 9 000.00	Not Detected		-	-	-	-	-	-	-	-

[1)] Restricted band.

Note:
1. Limit = -27 dBm/MHz = 68.20 dBuV/m

802.11a_Highest Channel (5 700 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	78.20	3.42	-62.93	28.91	-30.60	47.60	68.20	20.70
1 992.06	1 000	V	79.20	4.49	-62.70	30.91	-27.30	51.90	68.20	16.30
3 990.63 1)	1 000	H	75.60	5.91	-62.34	32.63	-23.80	51.80	74.00	21.80
8 623.19	1 000	V	62.30	8.24	-61.35	35.91	-17.20	45.10	68.20	23.10
16 206.00	1 000	H	57.40	11.91	-60.65	41.14	-7.60	49.80	68.20	18.40
20 026.75	1 000	H	47.80	13.00	-51.60	45.00	6.40	54.20	68.20	14.00
37 019.00	1 000	V	46.90	18.90	-55.20	46.10	9.80	56.70	68.20	11.50
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63 1)	1 000	H	66.80	5.91	-62.34	32.63	-23.80	43.00	54.00	11.00
Above 4 000.00	Not Detected		-	-	-	-	-	-	-	-

1) Restricted band.

- 5 725 Band

802.11a_Lowest Channel (5 745 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 678.56	1 000	V	75.50	4.07	-63.69	30.12	-29.50	46.00	68.20	22.20
1 996.19	1 000	V	78.80	4.49	-62.71	30.92	-27.30	51.50	68.20	16.70
3 990.63 1)	1 000	H	75.90	5.91	-62.34	32.63	-23.80	52.10	74.00	21.90
8 335.69 1)	1 000	V	63.00	8.11	-61.57	36.06	-17.40	45.60	74.00	28.40
15 750.31	1 000	V	58.40	11.77	-61.20	40.63	-8.80	49.60	68.20	18.60
20 090.00	1 000	H	47.70	13.00	-51.60	45.10	6.50	54.20	68.20	14.00
38 077.75	1 000	V	46.50	18.60	-53.30	44.40	9.70	56.20	68.20	12.00
Above 39 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63 1)	1 000	H	65.30	5.91	-62.34	32.63	-23.80	41.50	54.00	12.50
8 335.69 1)	1 000	V	51.60	8.11	-61.57	36.06	-17.40	34.20	54.00	19.80
Above 9 000.00	Not Detected		-	-	-	-	-	-	-	-

1) Restricted band.
2) Band Edge.

Note:
1. Limit = -27 dBm/MHz = 68.20 dBuV/m

802.11a_Middle Channel (5 785 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 197.31	1 000	V	78.10	3.42	-62.93	28.91	-30.60	47.50	68.20	20.70
1 995.50	1 000	V	79.20	4.49	-62.71	30.92	-27.30	51.90	68.20	16.30
3 990.63 1)	1 000	H	76.00	5.91	-62.34	32.63	-23.80	52.20	74.00	21.80
8 650.50	1 000	H	62.40	8.26	-61.36	35.90	-17.20	45.20	68.20	23.00
17 547.19	1 000	V	56.50	12.32	-60.33	42.71	-5.30	51.20	68.20	17.00
20 158.75	1 000	H	48.10	13.00	-51.60	45.20	6.60	54.70	68.20	13.50
37 068.50	1 000	V	46.30	18.90	-55.20	46.00	9.70	56.00	68.20	12.20
Above 38 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63 1)	1 000	H	66.60	5.91	-62.34	32.63	-23.80	42.80	54.00	11.20
Above 4 000.00	Not Detected		-	-	-	-	-	-	-	-

1) Restricted band.

802.11a_Highest Channel (5 825 ㎒)

Frequency [㎒]	Receiver Bandwidth [㎑]	Pol. [V/H]	Reading [dB(㎶)]	Cable Loss [dB]	Amp Gain [dB]	Antenna Factor [dB]	Factor [dB]	Result [dB(㎶/m)]	Limit [dB(㎶/m)]	Margin [dB]
Peak DATA. Emissions above 1 ㎓										
1 994.81	1 000	V	78.80	4.49	-62.71	30.92	-27.30	51.50	68.20	16.70
3 990.63 1)	1 000	H	75.90	5.91	-62.34	32.63	-23.80	52.10	74.00	21.90
5 852.38 2)	1 000	H	68.90	7.02	-62.75	35.33	-20.40	48.50	116.80	68.30
8 289.69 1)	1 000	V	62.50	8.09	-61.47	36.08	-17.30	45.20	74.00	28.80
16 779.56	1 000	H	56.80	12.10	-60.63	41.83	-6.70	50.10	68.20	18.10
20 191.75	1 000	H	47.00	13.10	-51.60	45.20	6.70	53.70	68.20	14.50
38 110.75	1 000	V	46.30	18.60	-53.20	44.40	9.80	56.10	68.20	12.10
Above 39 000.00	Not Detected		-	-	-	-	-	-	-	-
Average DATA. Emissions above 1 ㎓										
3 990.63 1)	1 000	H	65.70	5.91	-62.34	32.63	-23.80	41.90	54.00	12.10
8 289.69 1)	1 000	V	51.20	8.09	-61.47	36.08	-17.30	33.90	54.00	20.10
Above 4 000.00	Not Detected		-	-	-	-	-	-	-	-

1) Restricted band.
2) Band Edge.

Note:
1. Limit = -27 dBm/MHz = 68.20 dBuV/m
2. Band Edge limit = limit(y)=122.2 dBuV/m-($\Delta y/\Delta x * x\ MHz$)
(122 dBuV/m = 27dBm/MHz, Δy = 27 dBm/MHz–15.6 dBm/MHz, Δx = 5MHz,
$x\ MHz$ = Band Edge- Measured frequency)

5.6 Frequency Stability

5.6.1 Regulation

5.6.1.1 Regulation for FCC

According to §15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

5.6.1.2 Regulation for IC

According to § RSS GEN Issue 4, 6.11, In circumstances when the transmitter frequency stability is not stated in the applicable RSS or reference measurement method, the following applies:

- Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage. Unless specified otherwise in an RSS applicable to the device, the reference temperature for radio transmitters is +20°C (+68°F);
- A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which must be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used; and
- The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

With the transmitter installed in an environmental test chamber, the unmodulated carrier frequency shall be measured under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement. The following temperatures and supply voltage ranges apply, unless specified otherwise in the applicable RSS:

(a) at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage; and
(b) at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage.

If the frequency stability limits are only met within a temperature range that is smaller than the -30°C to +50°C range specified in (a), the frequency stability requirement will be deemed to be met if the transmitter is automatically prevented from operating outside this smaller temperature range and if the published operating characteristics for the equipment are revised to reflect this restricted temperature range.

In addition, if an unmodulated carrier is not available, the measurement method shall be described in the test report.

5.6.2 Measurement Procedure

The frequency stability of the carrier frequency of the intentional radiator shall be maintained all conditions of normal operation as specified in the users manual. The frequency stability shall be maintained over a temperature variation of specified in the users manual at normal supply voltage, and over a variation in the primary supply voltage of specified in the users manual of the rated supply voltage at a temperature of 20 °C. For equipment that is capable only of operating from a battery, the frequency stability tests shall be performed using a new battery without any further requirement to vary supply voltage.

1. The EUT was placed inside the environmental test chamber.
2. The temperature was incremented by 10 °C intervals from lowest temperature.
3. Each increase step of temperature measured the frequency.
4. The test temperature was set 20°C and the supply voltage was then adjusted on the EUT from 85 % to 115% and the frequency record.

5.6.3 Test Result

-Complied

- 5 150 Band

- 5 180 ㎒

Voltage [%]	Power [V]	Temp. [°C]	Reading Frequency [㎐]	Frequency Error [㎐]	Frequency Error [%]
100	24.00	-20	5 180 061 207	61 207	0.001 2
		-10	5 180 061 869	61 869	0.001 2
		0	5 180 065 041	65 041	0.001 3
		10	5 180 065 898	65 898	0.001 3
		20	5 180 064 658	64 658	0.001 2
		30	5 180 057 551	57 551	0.001 1
		40	5 180 058 069	58 069	0.001 1
		50	5 180 062 772	62 772	0.001 2
		60	5 180 066 426	66 426	0.001 3
		20	5 180 056 421	56 421	0.001 1
85	21.60	20	5 180 056 413	56 413	0.001 1
115	26.40	20	5 180 056 416	56 416	0.001 1

- 5 250 Band

- 5 260 ㎒

Voltage [%]	Power [V]	Temp. [°C]	Reading Frequency [㎐]	Frequency Error [㎐]	Frequency Error [%]
100	24.00	-20	5 260 062 048	62 048	0.001 2
		-10	5 260 063 470	63 470	0.001 2
		0	5 260 066 295	66 295	0.001 3
		10	5 260 067 264	67 264	0.001 3
		20	5 260 065 090	65 090	0.001 2
		30	5 260 058 435	58 435	0.001 1
		40	5 260 058 706	58 706	0.001 1
		50	5 260 061 866	61 866	0.001 2
		60	5 260 069 151	69 151	0.001 3
		20	5 260 057 375	57 375	0.001 1
85	21.60	20	5 260 057 331	57 331	0.001 1
115	26.40	20	5 260 057 330	57 330	0.001 1

- 5 470 Band

- 5 500 ㎒

Voltage [%]	Power [V]	Temp. [°C]	Reading Frequency [㎐]	Frequency Error [㎐]	Frequency Error [%]
100	24.00	-20	5 500 064 642	64 642	0.001 2
		-10	5 500 065 884	65 884	0.001 2
		0	5 500 069 409	69 409	0.001 3
		10	5 500 070 538	70 538	0.001 3
		20	5 500 066 557	66 557	0.001 2
		30	5 500 061 108	61 108	0.001 1
		40	5 500 061 656	61 656	0.001 1
		50	5 500 063 530	63 530	0.001 2
		60	5 500 073 421	73 421	0.001 3
		20	5 500 061 747	61 747	0.001 1
85	21.60	20	5 500 061 943	61 943	0.001 1
115	26.40	20	5 500 062 037	62 037	0.001 1

- 5 725 Band

- 5 745 ㎒

Voltage [%]	Power [V]	Temp. [°C]	Reading Frequency [㎐]	Frequency Error [㎐]	Frequency Error [%]
100	24.00	-20	5 745 066 530	66 530	0.001 2
		-10	5 745 070 686	70 686	0.001 2
		0	5 745 073 142	73 142	0.001 3
		10	5 745 073 650	73 650	0.001 3
		20	5 745 069 173	69 173	0.001 2
		30	5 745 063 589	63 589	0.001 1
		40	5 745 064 561	64 561	0.001 1
		50	5 745 066 299	66 299	0.001 2
		60	5 745 080 754	80 754	0.001 4
		20	5 745 064 731	64 731	0.001 1
85	21.60	20	5 745 065 024	65 024	0.001 1
115	26.40	20	5 745 065 120	65 120	0.001 1

5.7 DFS(Dynamic Frequency Selection)

5.7.1 Regulation

5.7.1.1 Regulation for FCC

Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS).

(1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 ㎓ band and the 5.47-5.725 ㎓ band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 ㏈ below the mean EIRP value of 30 ㏈m. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 ㎽.

(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 ㏈ emission bandwidth in the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 ㎽ to 1 W is −64 ㏈m. For devices that operate with less than 200 ㎽ e.i.r.p. and a power spectral density of less than 10 ㏈m in a 1 ㎒ band, the minimum detection threshold is −62 ㏈m. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 ㏈i antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

(i) Operational Modes. The DFS requirement applies to the following operational modes:

(A) The requirement for channel availability check time applies in the master operational mode.

(B) The requirement for channel move time applies in both the master and slave operational modes.

(ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.

(iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

(i) Device Security. All U-NII devices must contain security features to protect against modification of software by unauthorized parties.

5.7.1.2 Regulation for IC

(1) DFS radar signal detection threshold

Devices shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. The device must detect radar signals within its entire emission bandwidth. The minimum DFS radar signal detection threshold is described below in Table 1.

Table 1: DFS Detection Threshold for Master Devices and Slave Devices with Radar Detection

Devices	DFS Threshold
Devices with an e.i.r.p. < 200 ㎽ AND a Power Spectral Density < 10 dBm/㎒	-62 dBm
Devices with 200 ㎽ ≤ e.i.r.p. ≤ 1 W	-64 dBm
Note: The detection threshold power is the received power, averaged over a 1-microsecond reference to a 0 dBi antenna.	

(2) Operational requirements

The requirement for channel availability check time applies in the master operational mode. The requirement for channel move time applies in both the master and slave operational modes. The requirement for in-service monitoring does not apply to slave devices without radar detection.

(i) In-service monitoring: an LE-LAN device shall be able to monitor the operating channel to check that a co-channel radar has not moved or started operation within range of the LE-LAN device. During in-service monitoring, the LE-LAN radar detection function continuously searches for radar signals between normal LE-LAN transmissions.

(ii) Channel availability check time: the device shall check whether there is a radar system already operating on the channel before it initiates a transmission on a channel and when it moves to a channel. The device may start using the channel if no radar signal with a power level greater than the interference threshold value specified in Section 6.3(1) above is detected within 60 seconds.

(iii) Channel move time: after a radar signal is detected, the device shall cease all transmissions on the operating channel within 10 seconds.

(iv) Channel closing transmission time: is comprised of 200 ㎳ starting at the beginning of the channel move time plus any additional intermittent control signals required to facilitate a channel move (an aggregate of 60 ms) over the remaining 10-second period of the channel move time.

(v) Non-occupancy period: a channel that has been flagged as containing a radar signal, either by a channel availability check or in-service monitoring, is subject to a 30-minute non-occupancy period where the channel cannot be used by the LE-LAN device. The non-occupancy period starts from the time that the radar signal is detected.

5.7.2 Measurement Procedure

The following table from FCC 06-96 lists the applicable requirements for the DFS testing.
The device evaluated in this report is considered a client device without radar detection capability.

5.7.3 Test Result

The UUT is a U-NII Device operating in Client mode without radar detection. The radar test signals are injected into the Master Device.

The highest power level within these bands in -5.47 dBm (0.28 ㎽) EIRP in the 5 250 ~ 5 350 ㎒ band and -6.54 dBm (0.22 ㎽) EIRP in the 5 470 ~ 5 650 ㎒ band.

The gain antenna assembly utilized with the master has a gain of -3.50 dBi.

The calibrated conducted DFS detection threshold level is set to -66.50 dBm.((-64 + 1 + -3.50) = -66.50)

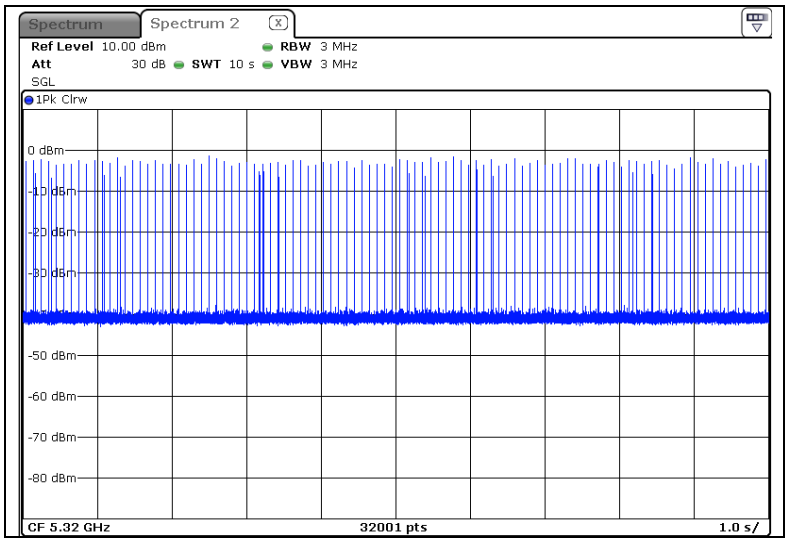
5.7.4 Test Plot

Figure 3. Plot of the DFS

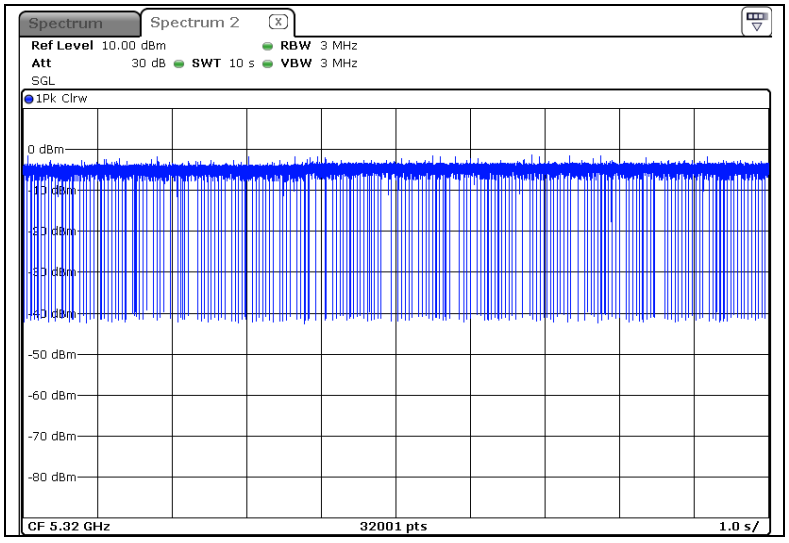
- 5 250 Band

- 5 320 ㎒

No traffic signal(master signal)



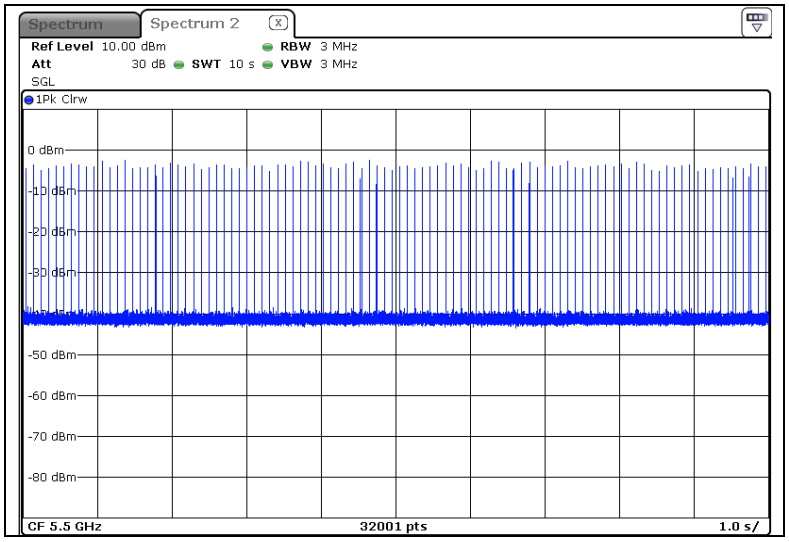
Client (EUT) Data Traffic Signal



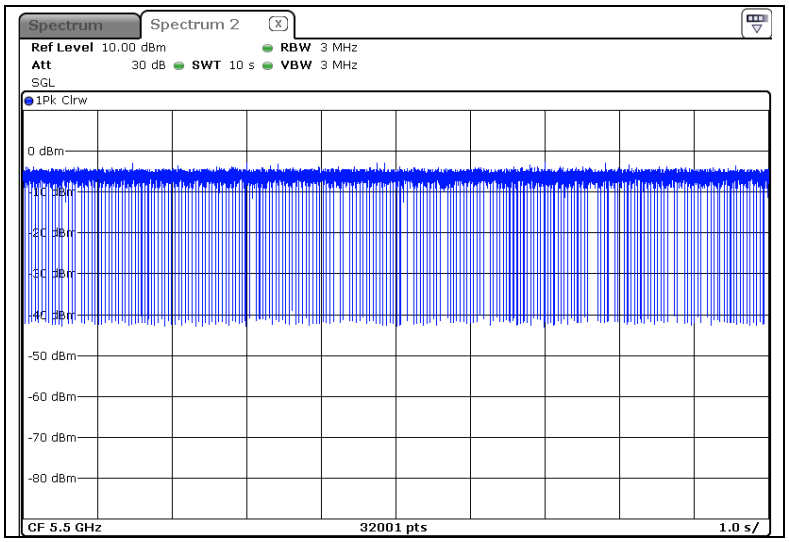
- 5 470 Band

- 5 500 ㎒

No traffic signal(master signal)

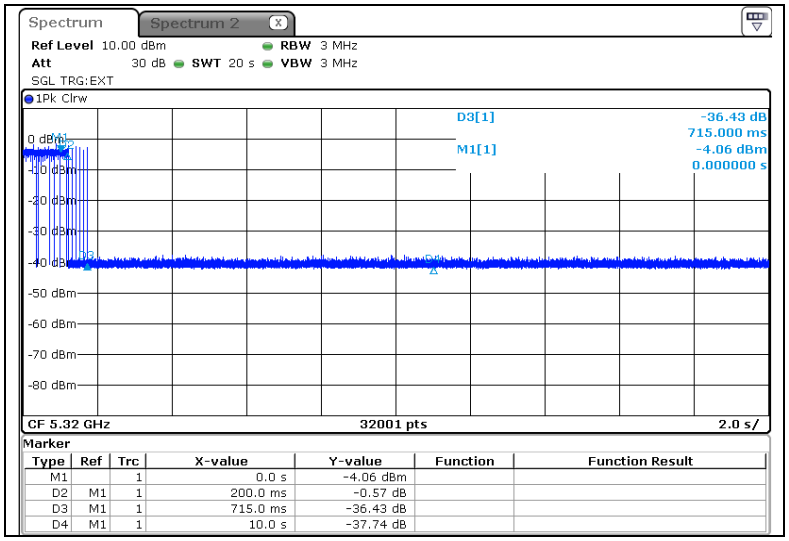


Client (EUT) Data Traffic Signal



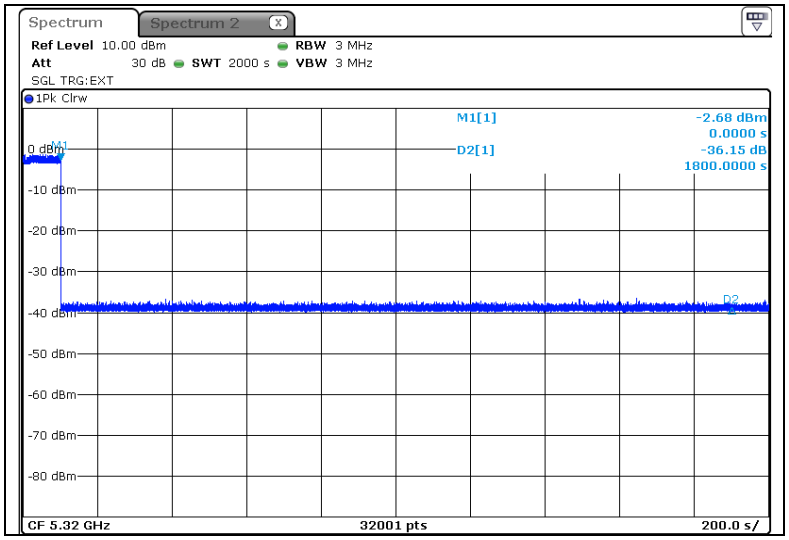
Channel closing time and move time

- 5 320 ㎒



Channel move time

- M1 : Added Radar signal
- D2: Channel move time



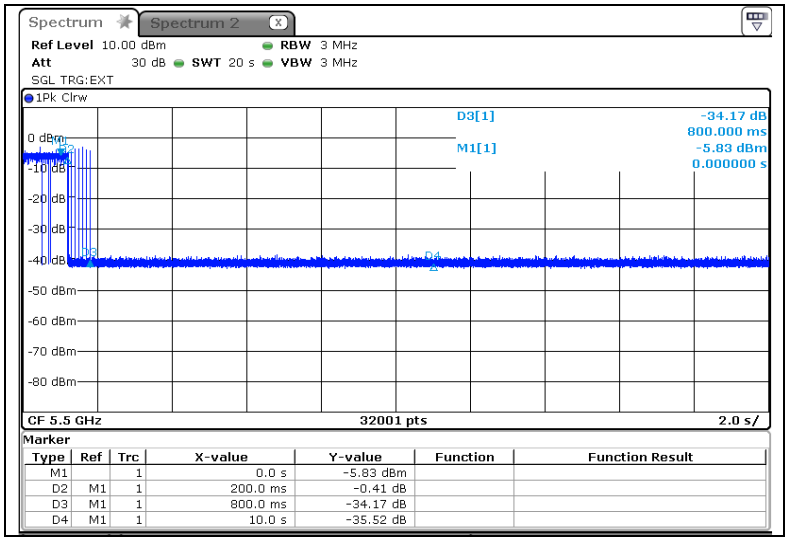
Closing time

Test Mode	Frequency [㎒]	Channel move time [sec]	Closing time [sec]
802.11a	5 320	0.715	0.016
Limit		< 10 sec	< 1 sec

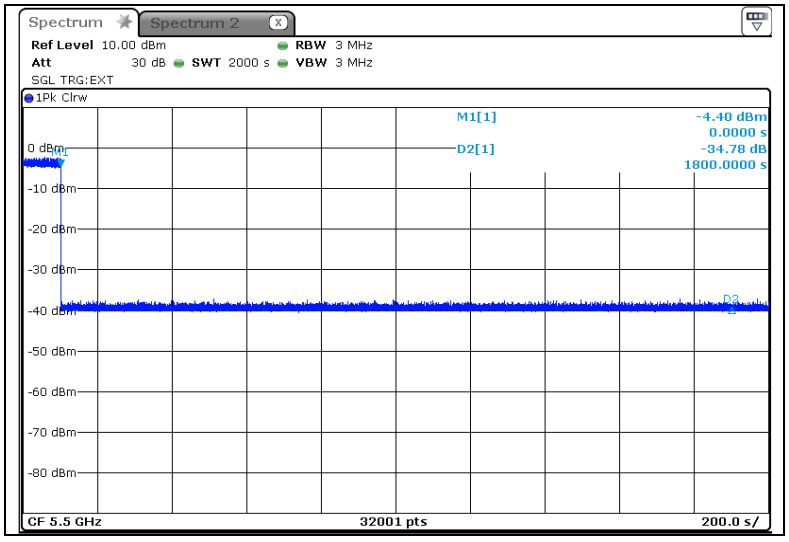
Note. Closing time = 0.000 625 s × 25 = 0.015 625 s
Closing time : Burst unit time(20 s / 32 000 points) × Number of burst(between D2 and D3)

Channel closing time and move time

- 5 500 ㎒



Channel move time
- M1 : Added Radar signal
- D2: Channel move time



Closing time

Test Mode	Frequency [㎒]	Channel move time [sec]	Closing time [sec]
802.11a	5 500	0.800	0.026
Limit		< 10 sec	< 1 sec

Note. Closing time = 0.000 625 s × 41 = 0.025 625 s
Closing time : Burst unit time(20 s / 32 000 points) × Number of burst(between D2 and D3)

5.8 Conducted Emission

5.8.1 Regulation

5.8.1.1 Regulation for FCC

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

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

* Decreases with the logarithm of the frequency.

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

5.6.1.2 Regulation for IC

According to § RSS GEN Issue 4, 8.8, A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 ㎑ -30 ㎒, shall not exceed the limits in Table 3.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 ㎒ to 30 ㎒ shall not exceed the limits shown in Table 3 below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured in accordance with the reference publication mentioned in Section 3.

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

* The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

5.8.2 Measurement Procedure

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

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

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

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

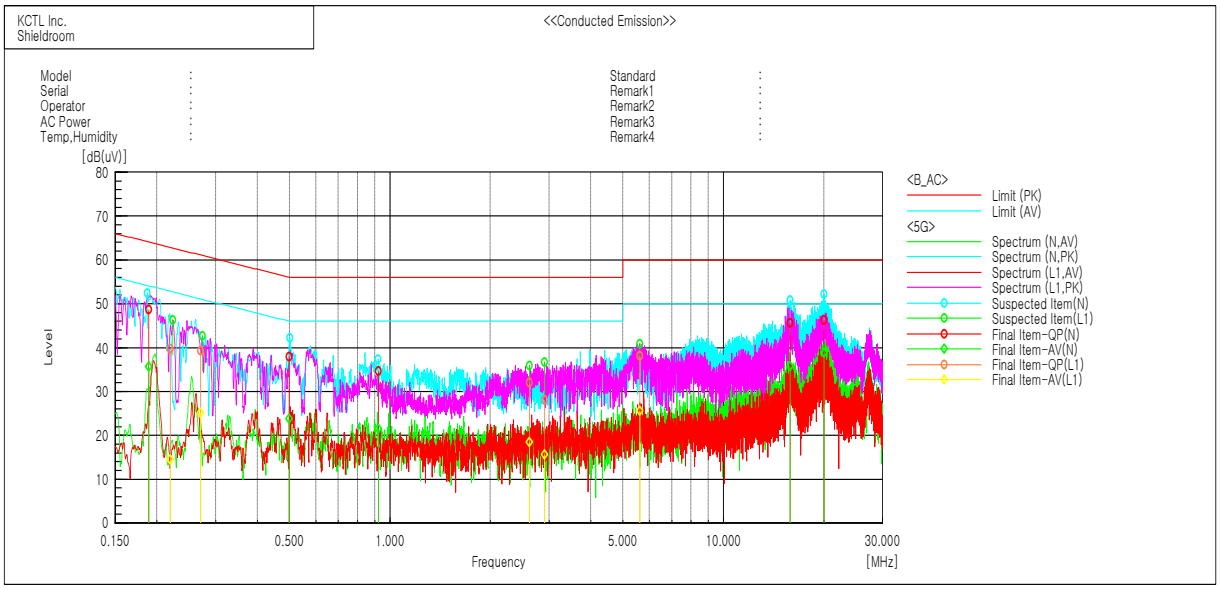
5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 ㎑ or to QUASI-PEAK and AVERAGE within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

5.8.3 Test Result

- Complied

Figure 4. plot of Conducted Emission

- Conducted worst-case data : 802.11a_Lowest Chanel (5 180 ㎒)



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.18884	38.6	25.6	10.0	48.6	35.6	64.1	54.1	15.5	18.5
2	0.49823	28.1	14.0	9.8	37.9	23.8	56.0	46.0	18.1	22.2
3	0.92332	24.8	11.7	9.8	34.6	21.5	56.0	46.0	21.4	24.5
4	15.83297	35.6	25.8	10.0	45.6	35.8	60.0	50.0	14.4	14.2
5	19.99977	36.1	28.7	10.1	46.2	38.8	60.0	50.0	13.8	11.2

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.21933	30.0	4.7	9.8	39.8	14.5	62.8	52.8	23.0	38.3
2	0.27022	29.6	15.4	9.7	39.3	25.1	61.1	51.1	21.8	26.0
3	2.6179	22.2	8.6	9.8	32.0	18.4	56.0	46.0	24.0	27.6
4	2.90795	18.3	5.8	9.8	28.1	15.6	56.0	46.0	27.9	30.4
5	5.61471	28.2	15.6	9.9	38.1	25.5	60.0	50.0	21.9	24.5

6. Test equipment used for test

	Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
■	Spectrum Analyzer	R & S	FSV40	100989	17.01.07
■	DC Power Supply	Agilent	E3632A	KR75304571	17.07.07
■	Signal Generator	R & S	SMR40	100007	17.06.02
■	Wideband Power Sensor	R & S	NRP-Z81	102398	17.02.11
■	ATTENUATOR	HP	8491A	29738	17.01.07
■	ATTENUATOR	HP	8491B	20205	17.05.03
■	POWER DIVIDER	Aeroflex/ Weinschel,Inc	1580-1	RM987	17.08.31
■	POWER DIVIDER	Aeroflex/ Weinschel,Inc	1580-1	RM988	17.08.31
■	Cisco Aironet IOS Access Point	Cisco	AIR-CAP2702E-A-K9	FGL1848X4LC	
■	EMI TEST RECEIVER	R & S	ESCI	100732	17.08.25
■	TWO-LINE V-NETWORK	R & S	ENV216	101352	17.08.26
■	Bi-Log Antenna	SCHWARZBECK	VULB 9163	552	18.06.27
■	Amplifier	SONOMA INSTRUMENT	310N	186280	17.04.07
■	Attenuator	SCHWARZBECK	DGA9552N	BU2404	17.04.08
■	Horn antenna	ETS.lindgren	3116	00086635	17.05.03
■	Horn antenna	ETS.lindgren	3117	161225	17.05.03
■	AMPLIFIER	L-3 Narda-MITEQ	AMF-7D-01001800 -22-10P	2003683	17.08.26
■	AMPLIFIER	L-3 Narda-MITEQ	JS44-18004000-33 -8P	2000996	17.08.26
■	LOOP Antenna	R & S	HFH2-Z2	100355	18.03.03
■	Antenna Mast	MATURO	AM4.0	079/3440509	-
■	Turn Table	MATURO	CO2000-SOFT	-	-
■	Highpass Filter	WT	WT-A1699-HS	WT160411002	17.07.08
■	Vector Signal Generator	R & S	SMBV100A	257566	17.01.07
■	Cable Assembly	HUER+SUHNER	SUCOFLEX 102	MY3571/2	-