TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR22-SRF0198-C Page (1) of (77)	eurofins | KCTL

1. Client

◦ Name : DREAMUS COMPANY

◦ Address : 311, Gangnam-daero, Seocho-gu, Seoul, Republic of Korea

◦ Date of Receipt : 2022-09-07

2. Use of Report : Certification

3. Name of Product / Model : ACRO CA1000T / PPR42

4. Manufacturer / Country of Origin : DREAMUS COMPANY / Korea

5. FCC ID : QDMPPR42

6. Date of Test : 2022-10-07 to 2022-10-18

7. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
(Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

8. Test method used : FCC Part 15 Subpart E, 15.407

9. Test Result : Refer to the test result in the test report

	Tested by	Technical Manager
Affirmation	Name : Hosung Lee (Signature)	Name : Heesu Ahn (Signature)

2022-12-08

Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2022-11-09	Originally issued	-
2022-11-15	Updated	12,15,22,25
2022-11-16	Updated	11
2022-12-08	Updated	76

Note. The report No. KR22-SRF0198 is superseded by the report No. KR20-SRF0198-A.

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

CONTENTS

1. General information

Client	:	DREAMUS COMPANY
Address	:	311, Gangnam-daero, Seocho-gu, Seoul, Republic of Korea
Manufacturer	:	DREAMUS COMPANY
Address	:	311, Gangnam-daero, Seocho-gu, Seoul, Republic of Korea
Factory	:	smartelectronics
Address	:	(Ochang-eup), 256, Yeocheon 3-gil, Cheongwon-gu, Cheongju-si, Chungcheongbuk-do, Korea
Laboratory	:	Eurofins KCTL Co.,Ltd.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132
		VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
		CAB Identifier: KR0040
		ISED Number: 8035A
		KOLAS No.: KT231

2. Device information

Equipment under test	:	ACRO CA1000T			
Model	:	PPR42			
Modulation technique	:	Bluetooth(BDR/EDR)	:	GFSK, π/4DQPSK, 8DPSK	
		Bluetooth(BLE)	:	GFSK	
		WIFI(802.11a/b/g/n/ac)	:	DSSS, OFDM	
Number of channels	:	Bluetooth	:	79 ch	
		BLE	:	40 ch	
		2.4 ㎓ WALN	:	11 ch (20 ㎒), 7 ch (40 ㎒)	
		UNII-1	:	4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒)	
		UNII-3	:	5 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒)	
Power source	:	DC 3.8 V(Battery)			
Antenna specification	:	LPS Antenna			
Antenna gain	:	BT/BLE/2.4 ㎓ WALN	:	-4.973 ㏈i	
		UNII-1	:	-8.016 ㏈i	
		UNII-3	:	-7.241 ㏈i	
Frequency range	:	Bluetooth	:	2 402 ㎒ ~ 2 480 ㎒	(BDR/EDR/BLE)
		2.4 ㎓ WALN	:	2 412 ㎒ ~ 2 462 ㎒	(802.11b/g/n_HT20)
				2 422 ㎒ ~ 2 452 ㎒	(802.11n_HT40)
		UNII-1	:	5 180 ㎒ ~ 5 240 ㎒	(802.11a/n_HT20)
				5 190 ㎒ ~ 5 230 ㎒	(802.11n_HT40)
				5 210 ㎒	(802.11ac_VHT80)
		UNII-3	:	5 745 ㎒ ~ 5 825 ㎒	(802.11a/n_HT20)
				5 755 ㎒ ~ 5 795 ㎒	(802.11n_HT40)
				5 775 ㎒	(802.11ac_VHT80)
Software version	:	1.0			
Hardware version	:	1.0			
Test device serial No.	:	N/A			
Operation temperature	:	-10 ℃ ~ 50 ℃			

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
Li-ion Polymer Battery	Shenzhen Hypercell Company Limited	HPL606781-1S2P-10100mAh	N/A	DC 3.8 V, 10,100 mA

2.2. Frequency/channel operations

This device contains the following capabilities:
Bluetooth(BDR/EDR/BLE), WLAN 2.4 ㎓(802.11b/g/n_HT20/HT40)
WLAN 5 ㎓(802.11a/n_HT20/40/ac_VHT80)

UNII-1		UNII-3	
Ch.	Frequency (㎒)	Ch.	Frequency (㎒)
36	5 180	149	5 745
40	5 200	157	5 785
48	5 240	165	5 825

Table 2.3.1. 802.11a/n_HT20 mode

UNII-1		UNII-3	
Ch.	Frequency (㎒)	Ch.	Frequency (㎒)
38	5 190	151	5 755
46	5 230	159	5 795

Table 2.3.2. 802.11n_HT40 mode

UNII-1		UNII-3	
Ch.	Frequency (㎒)	Ch.	Frequency (㎒)
42	5 210	155	5 775

Table 2.3.3 802.11ac_VHT80 mode

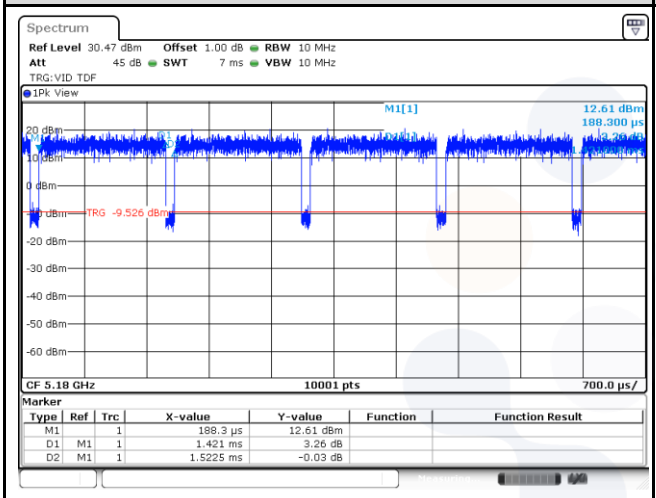
2.3. Duty Cycle Factor

Test mode	Frequency (㎒)	Period (ms)	Ton time (ms)	Duty cycle		Duty cycle factor (dB)
				(Linear)	(%)	
802.11a	5 180	1.523	1.421	0.933 3	93.33	0.30
802.11n_HT20	5 180	1.434	1.333	0.929 3	92.93	0.32
802.11n_HT40	5 190	0.766	0.664	0.866 8	86.68	0.62
802.11ac_VHT80	5 210	0.434	0.332	0.765 7	76.57	1.16

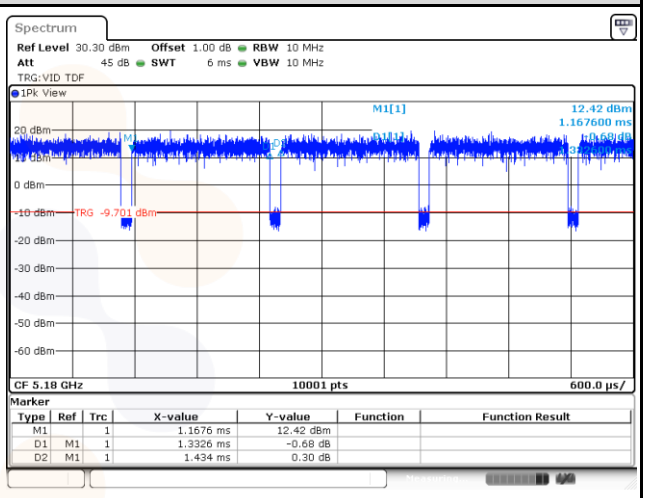
Notes.

1. Duty cycle (Linear) = Ton time / Period
2. DCF(Duty cycle factor) = 10log(1/duty cycle)
3. DCF is not compensated to average result if the duty cycle is more than 98%

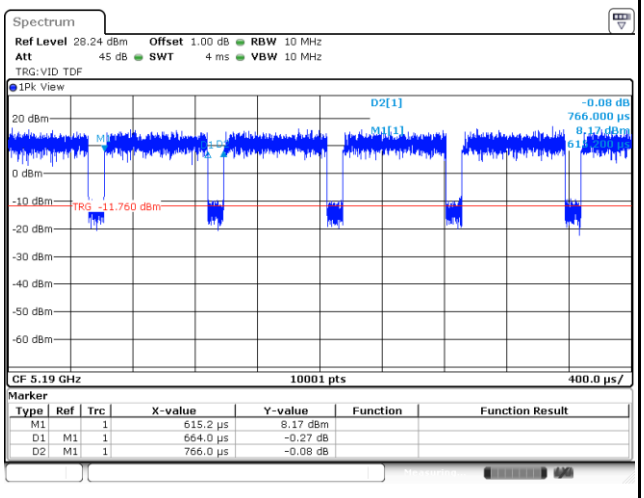
802.11a



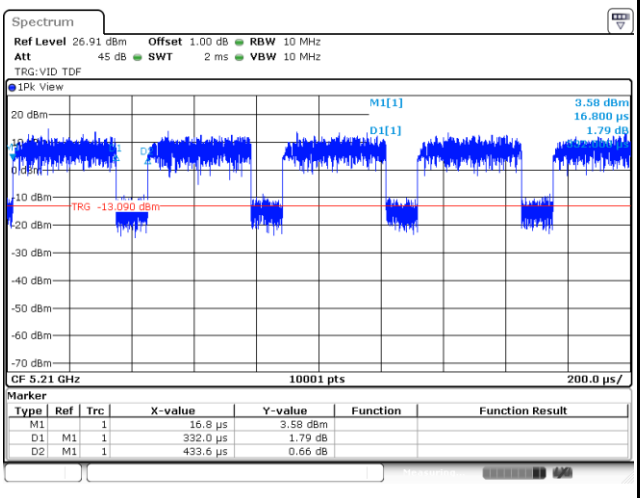
802.11n_HT20



802.11n_HT40



802.11ac_VHT80



2.4. Simultaneously transmission condition

	Technology	Test Mode	Frequency [㎒]
Case 1	WLAN 2.4 ㎓	802.11n40	2 422
	Bluetooth	EDR(3-DH1)	2 480
Case 2	WLAN 2.4 ㎓	802.11n40	2 422
	Bluetooth Low Energy	BLE (1M Bits/s, 37 Packet)	2 480
Case 3	WLAN 5 ㎓	802.11ac80 VHT80	5 210
	Bluetooth	EDR(3-DH1)	2 480
Case 4	WLAN 5 ㎓	802.11ac80 VHT80	5 210
	Bluetooth Low Energy	BLE (1M Bits/s, 37 Packet)	2 480

Notes.
The lowest margin condition among the channels and modes were selected for test.

3. Antenna requirement

According to §15.203, §15.407
An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 transmitter has attached LPS Antenna(internal antenna) on the board.
- The E.U.T Complies with the requirement of §15.203, §15.407

4. Summary of tests

FCC Part section(s)	Parameter	Test results
15.407(a)	Maximum conducted output power	Pass
15.407(a)	Maximum power spectral density	Pass
15.407(a)	26 ㏈ bandwidth	Pass
15.407(e)	6 ㏈ bandwidth	Pass
15.407(d), 15.205(a), 15.209(a)	Spurious emission	Pass(Note2)
	Band-edge, restricted band	Pass
15.207(a)	AC Conducted emissions	Pass

Notes:

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
   - The worst case is stand-alone without connecting accessories.
2. This requirements includes Simultaneously transmission data.
3. According to exploratory test no any obvious emission were detected from 9 ㎑ to 30 ㎒. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
4. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that **X** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **X** orientation.
5. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.10-2013
   - KDB 789033 D02 v02r01

5. The worst-case data rates were:
   802.11a mode: 6Mbps
   802.11n_HT20 mode: MCS0
   802.11n_HT40 mode: MCS0
   802.11ac_VHT80 mode: MCS0

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95% level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)	
Conducted RF power	0.9 dB	
Conducted spurious emissions	1.1 dB	
Radiated spurious emissions	9 kHz ~ 30 MHz	2.4 dB
	30 MHz ~ 1 000 MHz	2.3 dB
	1 000 MHz ~ 18 000 MHz	5.6 dB
	Above 18 000 GHz	5.7 dB
Conducted emissions	9 kHz ~ 150 kHz	1.6 dB
	150 kHz ~ 30 MHz	1.7 dB

6. Measurement results explanation example

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

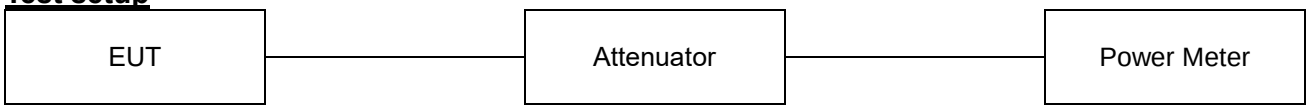
Frequency (㎒)	Factor(㏈)	Frequency (㎒)	Factor(㏈)
30	9.69	9 000	11.78
50	9.79	10 000	11.64
100	9.93	11 000	12.20
200	9.89	12 000	12.00
300	10.02	13 000	12.17
400	10.30	14 000	12.00
500	10.36	15 000	12.33
600	10.40	16 000	12.80
700	10.45	17 000	12.59
800	10.48	18 000	12.75
900	10.47	19 000	12.70
1 000	10.42	20 000	12.75
2 000	10.87	21 000	12.70
3 000	11.08	22 000	12.59
4 000	11.26	23 000	13.23
5 000	11.45	24 000	13.30
6 000	11.63	25 000	13.00
7 000	11.70	26 000	13.31
8 000	11.75	26 500	13.03

Note.
Offset(㏈) = RF cable loss(㏈) + Attenuator(㏈)

7. Test results

7.1. Maximum conducted output power

Test setup



Limit

According to §15.407(a)

Band	EUT category		Limit
UNII-1		Outdoor access point	1 W (30 dBm)
		Indoor access point	
		Fixed point-to-point access point	
	√	Client device	250 mW (23.98 dBm)
UNII-2A			250 mW or 11 dBm + 10logB[1)]
UNII-2C			250 mW or 11 dBm + 10logB[1)]
UNII-3	√		1 W (30 dBm)

Note:

1) Conducted output power limit B is the 26 dB emission bandwidth.

Test procedure

ANSI C63.10-2013-Section 12.3.2.4
KDB 789033 D02 v02r01 - Section E.3.a)

Test settings

Used test method is Section E.3.a)

◆ KDB 789033 D02 v02r01

Section E.2.d)

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 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 RBW ≥ 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%.

Section E.2.e)

Method SA-2 Alternative (power averaging(rms) detection with slow sweep with each spectrum bin 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 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 RBW ≥ 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) Manually set sweep time ≥ 10 × (number of points in sweep) × (total on/off period of the transmitted signal).

(vii) Set detector = power averaging (rms)

(viii) Perform a single sweep.

(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.

(x) 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%.

Section E.3.a)
Method PM (Measurement using an RF average power meter):

(xi) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

- The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five

(xii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in Ⅱ

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

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

Section E.3.b)
Method PM-G (Measurement using a gated RF average power meter):
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

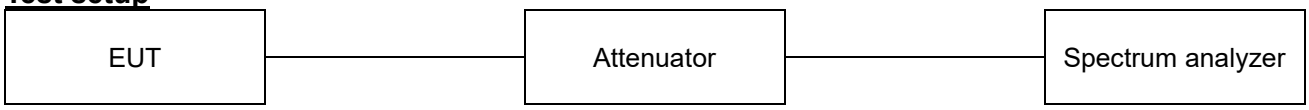
Test results

Test mode	Band	Freqeuncy (㎒)	Measured power (dBm)	DCF (dB)	Conducted output power (dBm)	Conducted Power Limit (dBm)
					Average	
802.11a	UNII-1	5180	11.64	0.30	11.94	23.98
		5200	11.53		11.83	
		5240	11.57		11.87	
	UNII-3	5745	9.37		9.67	30.00
		5785	9.77		10.07	
		5825	9.50		9.80	
802.11n HT20	UNII-1	5180	11.09	0.32	11.41	23.98
		5200	11.28		11.60	
		5240	11.35		11.67	
	UNII-3	5745	8.90		9.22	30.00
		5785	9.22		9.54	
		5825	9.27		9.59	
802.11n HT40	UNII-1	5190	10.91	0.62	11.53	23.98
		5230	10.95		11.57	
	UNII-3	5755	9.52		10.14	30.00
		5795	9.55		10.17	
802.11ac VHT80	UNII-1	5210	10.21	1.16	11.37	23.98
	UNII-3	5775	8.74		9.90	30.00

Note.
1. Result(dBm) = Reading Power + D.C.F

7.2. Maximum Power Spectral Density

Test setup



Limit

According to §15.407(a)

Band	EUT category		Limit
UNII-1		Outdoor access point	17 dBm/㎒
		Indoor access point	
		Fixed point-to-point access point	
	√	Client device	11 dBm/㎒
UNII-2A			11 dBm/㎒
UNII-2C			11 dBm/㎒
UNII-3	√		30 dBm/500 ㎑

Notes:

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain if the antenna exceed 6 dBi

Test procedure

KDB 789033 D02 v02r01 - Section F
ANSI C63.10-2013

Test settings

Used test method is Section E.2.b) Method SA-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 MHz.

(iii) Set VBW ≥ 3 MHz.

(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.

Section F

The rules requires “maximum power spectral density” measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission. Refer to III.A for additional guidance for devices that use channel aggregation.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in 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. Search function on the instrument to find the peak of the spectrum and record its value.
3. 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 II.E.2.g) (viii), add 1 dB 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 preceding procedures make use of 1 ㎒ RBW to satisfy directly the 1 ㎒ reference bandwidth specified in Section 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 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 II.B.I.a).
   b) Set VBW ≥ 3 RBW.
   c) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10 log (500 ㎑ /RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
   d) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10 log (1 ㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
   e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Notes:

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

Test results

Test mode	Band	Frequency (㎒)	Measured PSD (dB m/㎒)	DCF (dB)	Maximum PSD (dB m/㎒)	Limit (dB m/㎒)
802.11a	UNII-1	5 180	1.63	0.30	1.93	11
		5 200	1.55		1.85	
		5 240	1.90		2.20	
802.11n HT20		5 180	0.73	0.32	1.05	
		5 200	1.08		1.40	
		5 240	1.00		1.32	
802.11n HT40		5 190	-2.16	0.62	-1.54	
		5 230	-2.17		-1.55	
802.11ac VHT80		5 210	-5.41	1.16	-4.25	

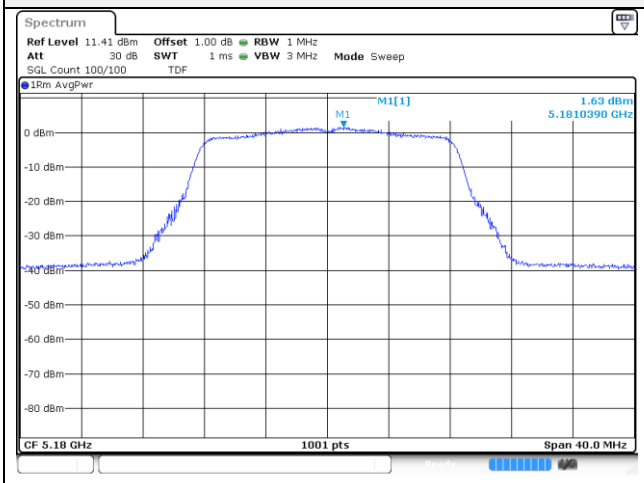
Test mode	Band	Frequency (㎒)	Measured PSD (dBm)	DCF (dB)	Maximum PSD (dBm/ 500 ㎑)	Limit (dBm/ 500 ㎑)
802.11a	UNII-3	5 745	-3.04	0.30	-2.74	30
		5 785	-2.83		-2.53	
		5 825	-3.31		-3.01	
802.11n HT20		5 745	-4.14	0.32	-3.82	
		5 785	-3.79		-3.47	
		5 825	-3.45		-3.13	
802.11n HT40		5 755	-6.82	0.62	-6.20	
		5 795	-6.41		-5.79	
802.11ac VHT80		5 775	-9.87	1.16	-8.71	

Notes:

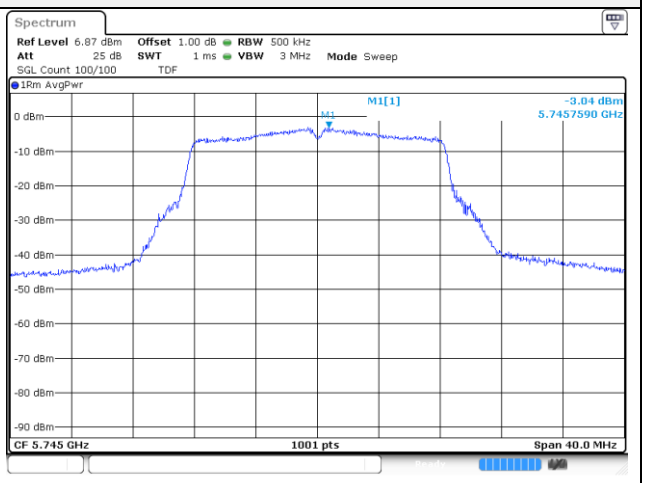
1. Maximum PSD calculation

- Maximum PSD = Measured PSD + DCF

UNII-1 / 802.11a / 5 180 ㎒

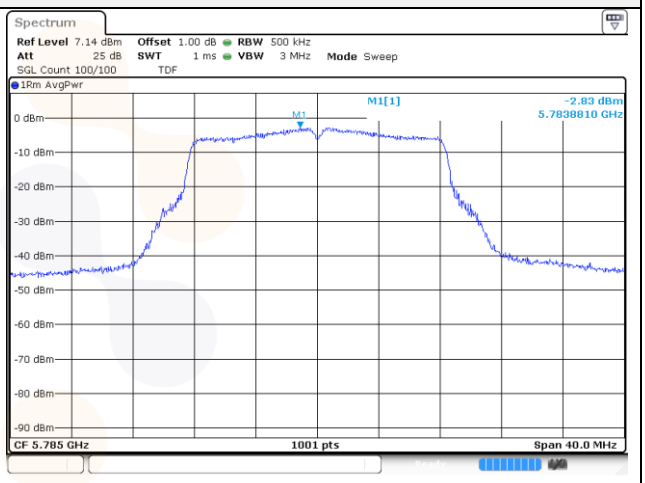


UNII-3 / 802.11a / 5 745 ㎒

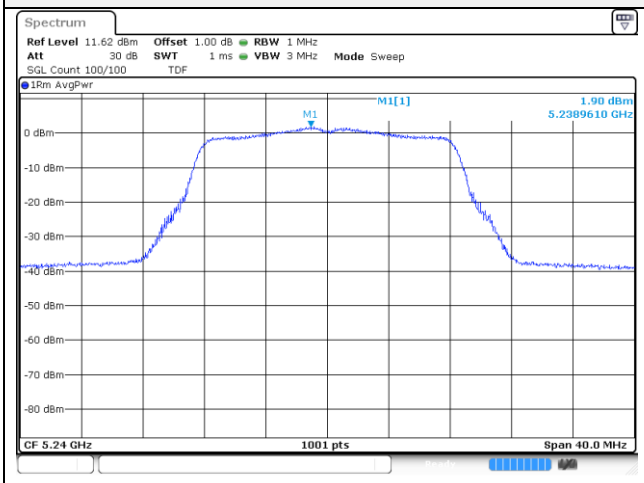


UNII-1 / 802.11a / 5 200 ㎒

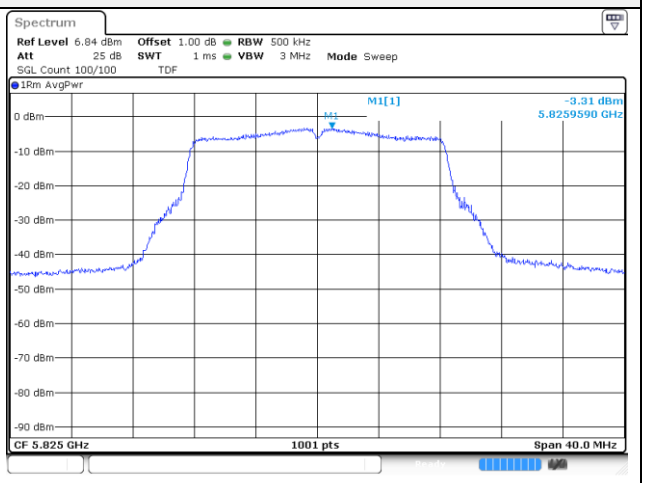
UNII-3 / 802.11a / 5 785 ㎒



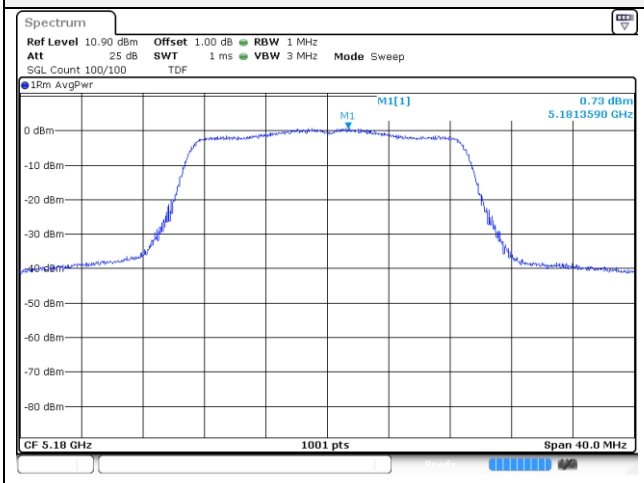
UNII-1 / 802.11a / 5 240 ㎒



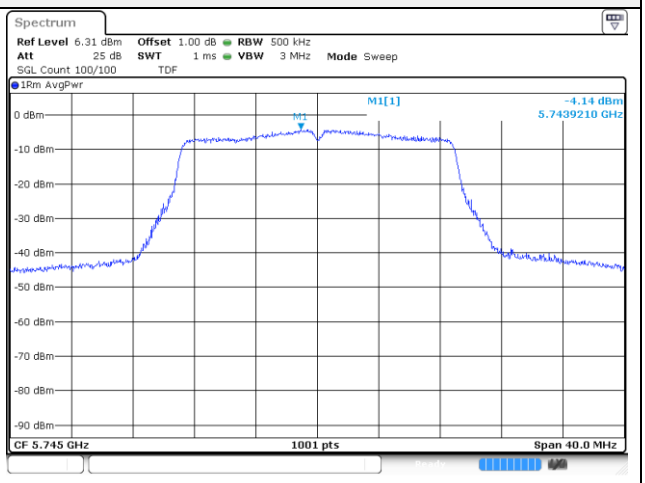
UNII-3 / 802.11a / 5 825 ㎒



UNII-1 / 802.11n HT20 / 5 180 ㎒

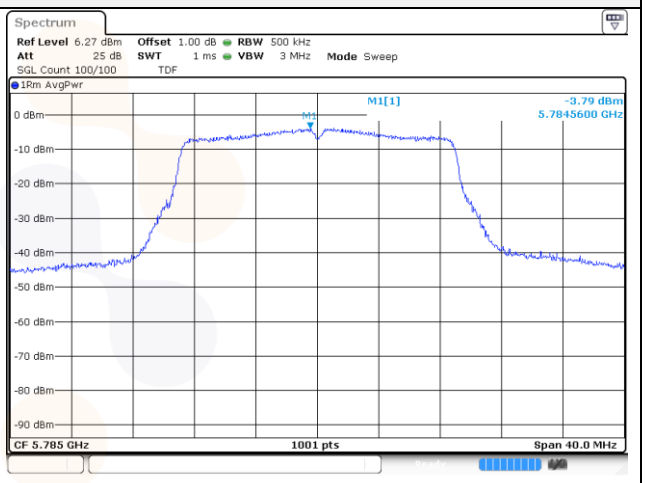


UNII-3 / 802.11n HT20 / 5 745 ㎒

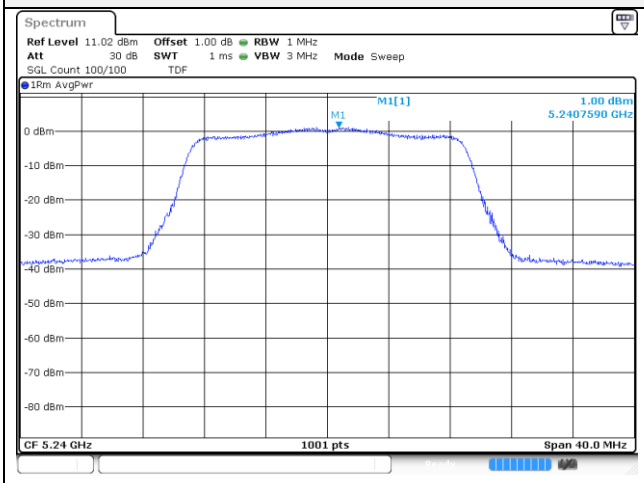


UNII-1 / 802.11n HT20 / 5 200 ㎒

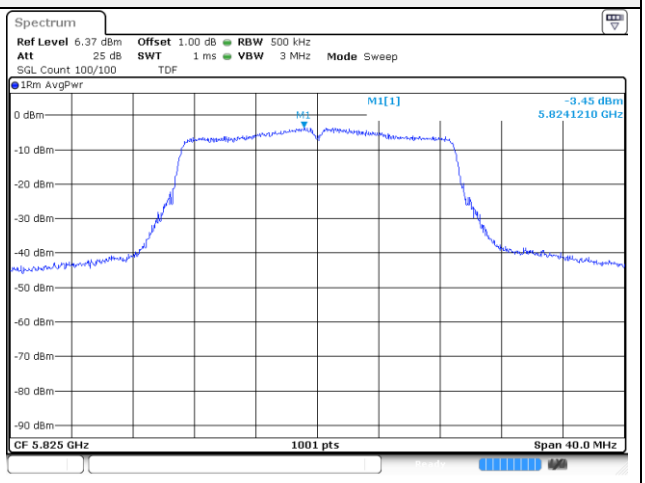
UNII-3 / 802.11n HT20 / 5 785 ㎒



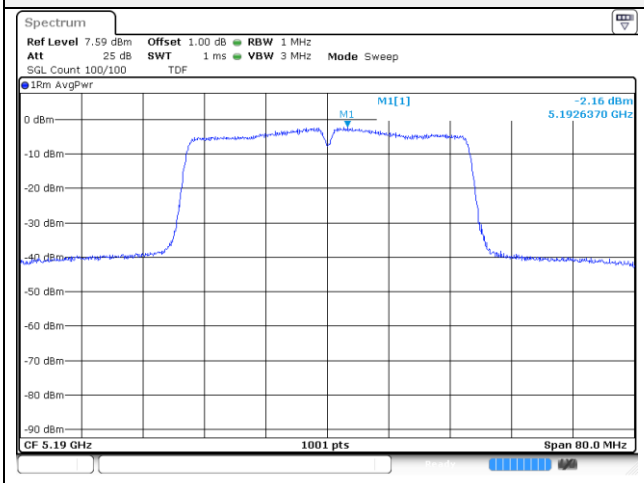
UNII-1 / 802.11n HT20 / 5 240 ㎒



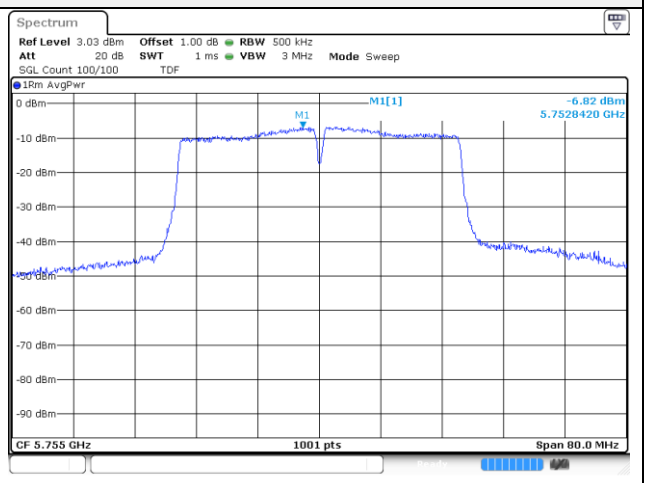
UNII-3 / 802.11n HT20 / 5 825 ㎒



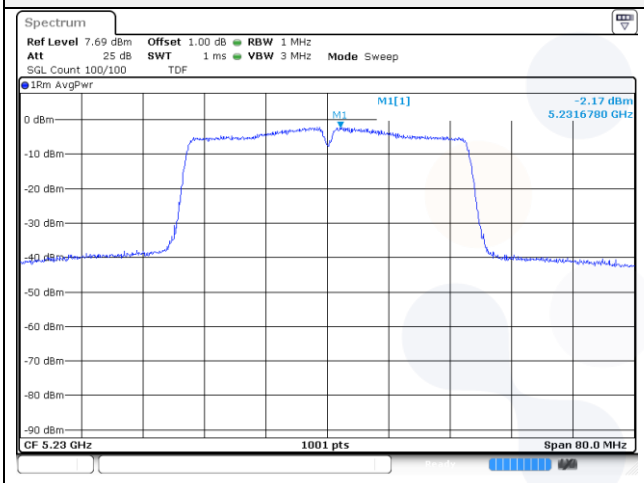
UNII-1 / 802.11n HT40 / 5 190 ㎒



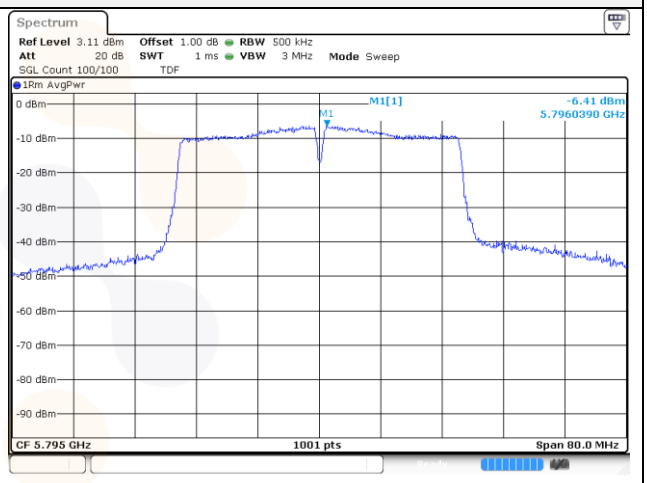
UNII-3 / 802.11n HT40 / 5 755 ㎒



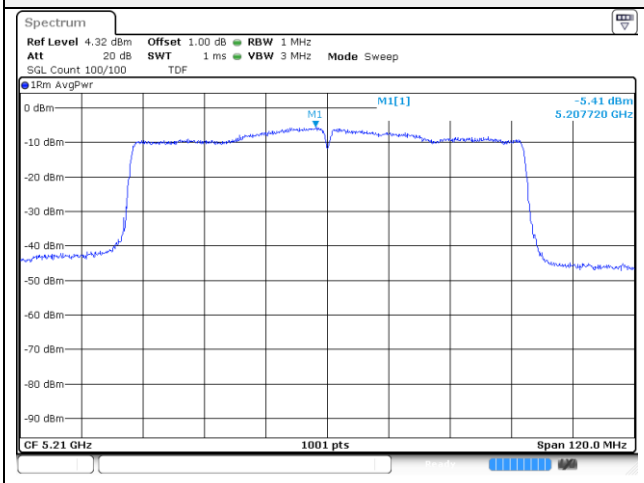
UNII-1 / 802.11n HT40 / 5 230 ㎒



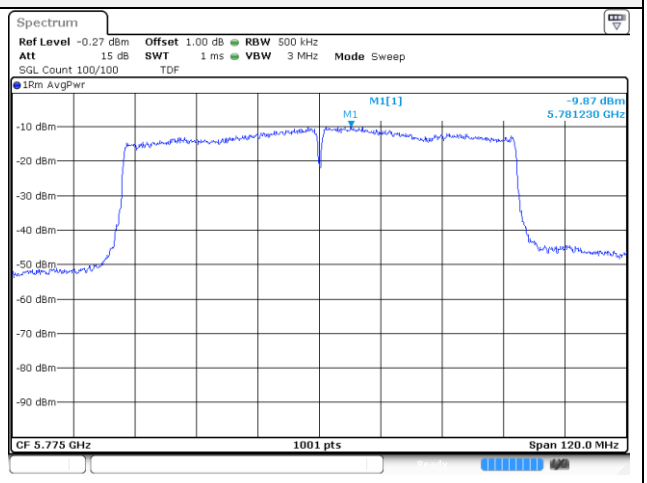
UNII-3 / 802.11n HT40 / 5 795 ㎒



UNII-1 / 802.11ac VHT80 / 5 210 ㎒

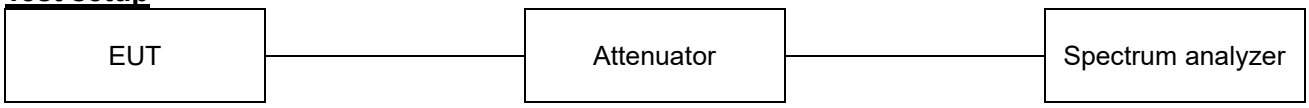


UNII-3 / 802.11ac VHT80 / 5 775 ㎒



7.3. 26 dB Bandwidth & 99% Bandwidth

Test setup



Limit

N/A

Test procedure

ANSI C63.10-2013 Section 12.4

26dB bandwidth

KDB 789033 D02 v02r01 - Section C.1

99% Bandwidth

KDB 789033 D02 v02r01 – Section D

Test settings

◆ **26dB Bandwidth**

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

◆ **99% Bandwidth**

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1% to 5% of the OBW
4. Set VBW ≥ 3 x RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99% power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Test results

26dB Bandwidth

Test mode	Band	Frequency(㎒)	Measured Bandwidth (㎒)
11a	UNII-1	5 180	21.23
		5 200	21.28
		5 240	21.28
11n HT20		5 180	21.48
		5 200	21.53
		5 240	21.43
11n HT40		5 190	40.26
		5 230	40.16
11ac VHT80		5 210	82.00

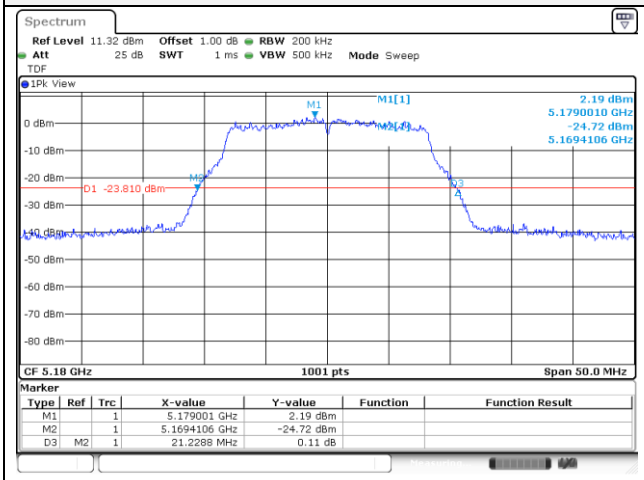
99% bandwidth

Test mode	Band	Frequency(㎒)	Measured Bandwidth (㎒)
11a	UNII-1	5 180	16.63
		5 200	16.63
		5 240	16.68
11n HT20		5 180	17.83
		5 200	17.78
		5 240	17.83
11n HT40		5 190	36.46
		5 230	36.46
11ac VHT80		5 210	75.52

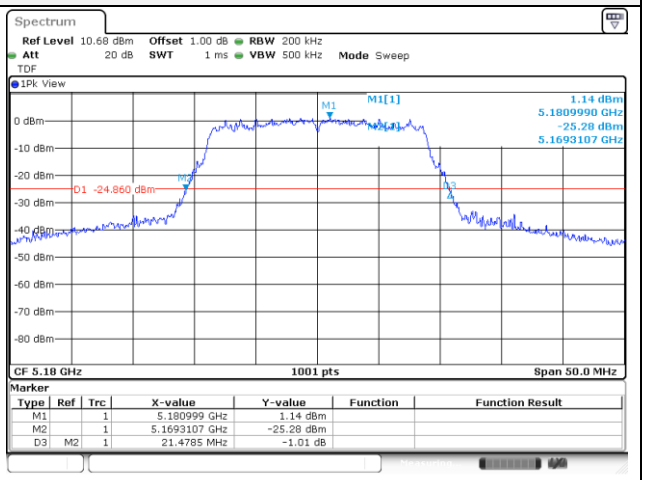
Note.
If 26dB Bandwidth across Band 2A or Band 1 but 99% test results are within the band no addition DFS test is needed on band 1.

26 dB bandwidth

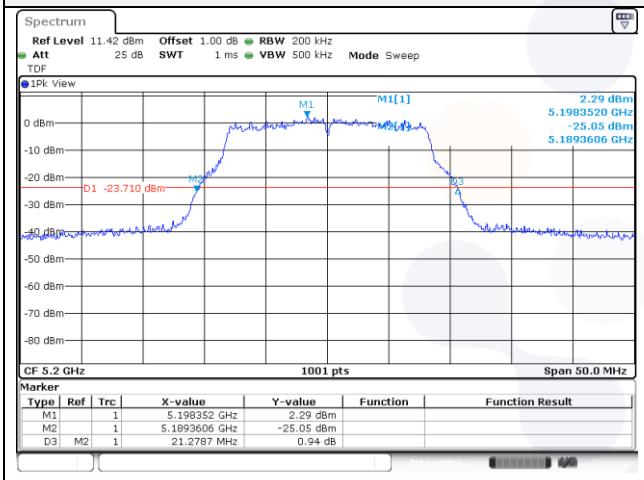
UNII-1 / 802.11a / 5 180 ㎒



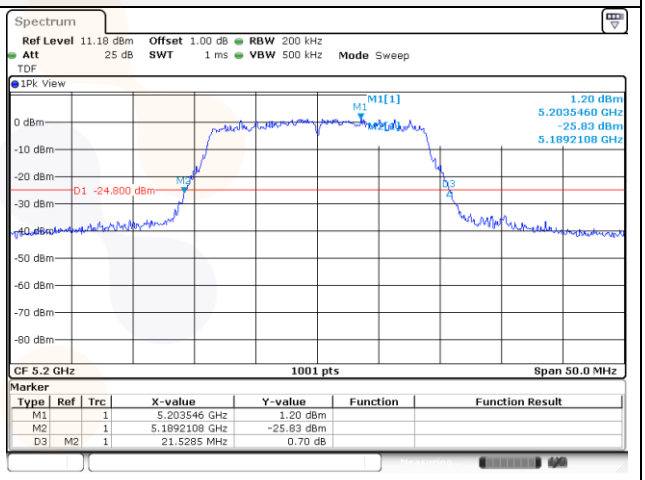
UNII-1 / 802.11n HT20 / 5 180 ㎒



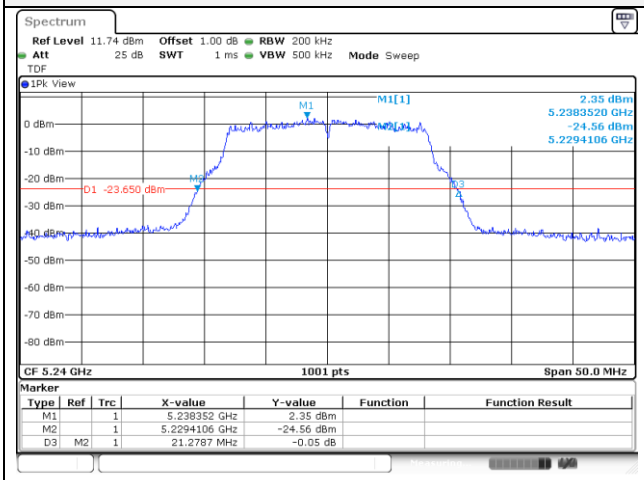
UNII-1 / 802.11a / 5 200 ㎒



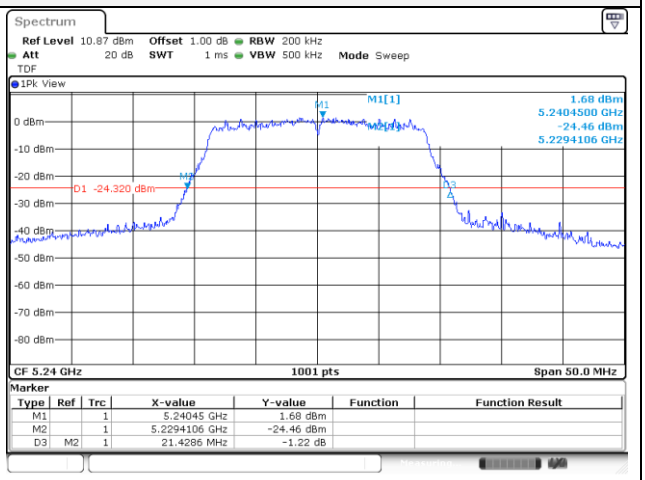
UNII-1 / 802.11n HT20 / 5 200 ㎒



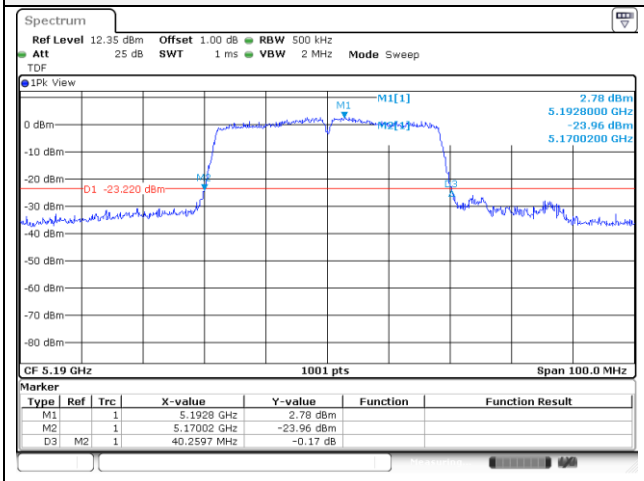
UNII-1 / 802.11a / 5 240 ㎒



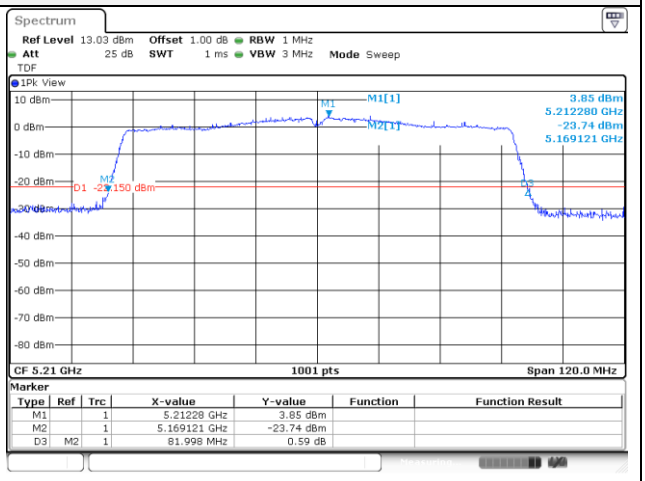
UNII-1 / 802.11n HT20 / 5 240 ㎒



UNII-1 / 802.11n HT40 / 5 190 ㎒



UNII-1 / 802.11ac VHT80 / 5 210 ㎒



UNII-1 / 802.11n HT40 / 5 230 ㎒

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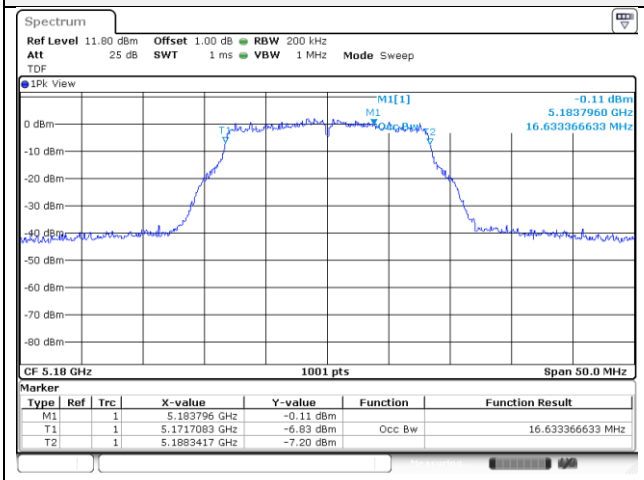
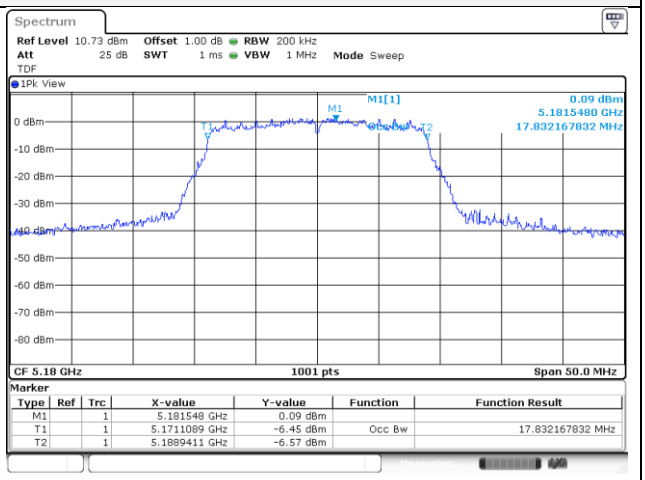
99% bandwidth

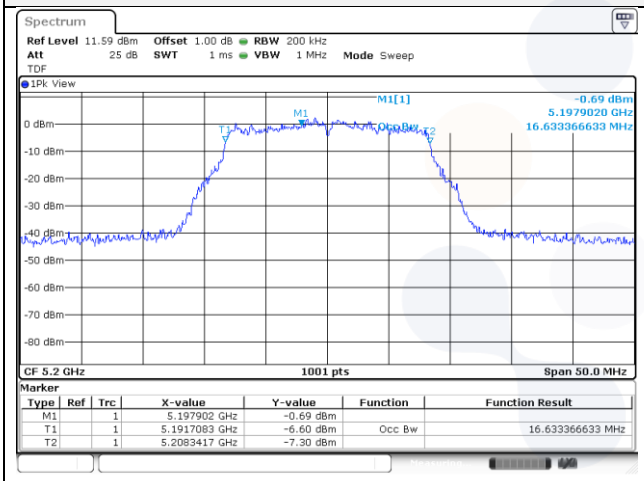
UNII-1 / 802.11a / 5 180 ㎒



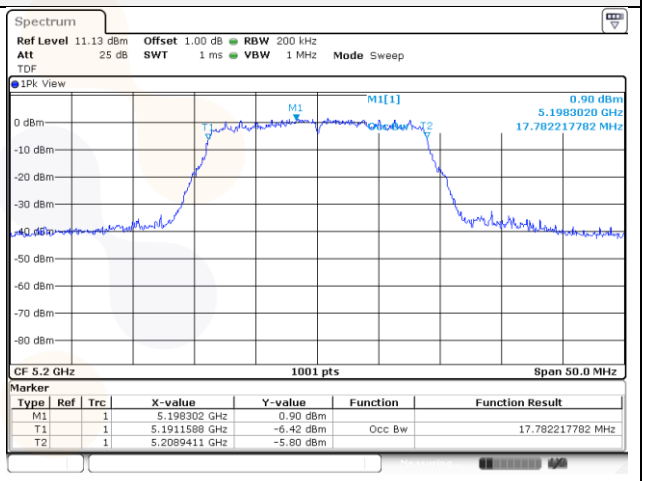
UNII-1 / 802.11n HT20 / 5 180 ㎒



UNII-1 / 802.11a / 5 200 ㎒



UNII-1 / 802.11n HT20 / 5 200 ㎒



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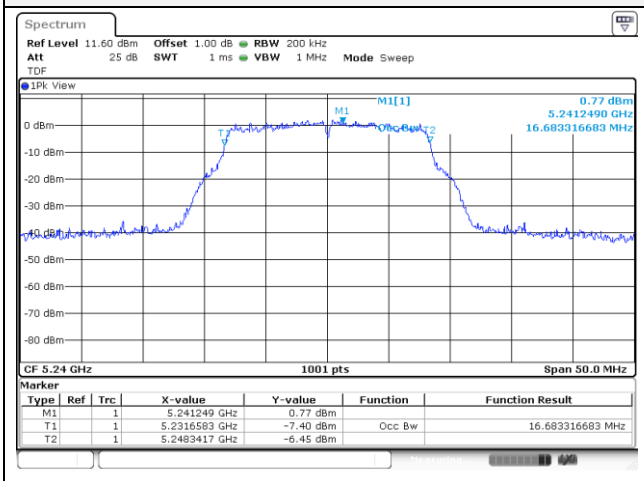

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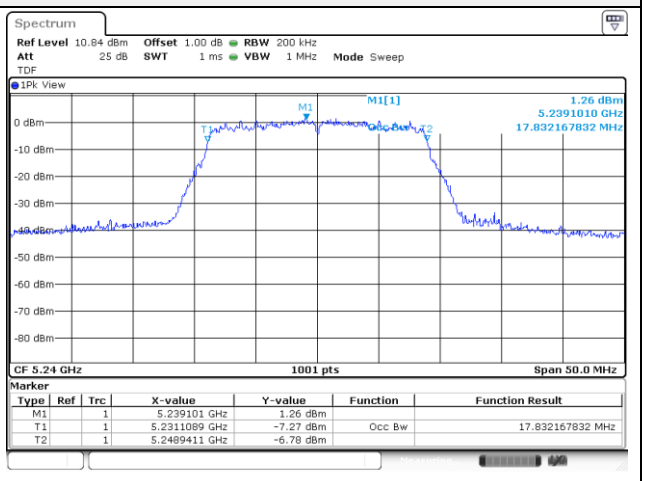

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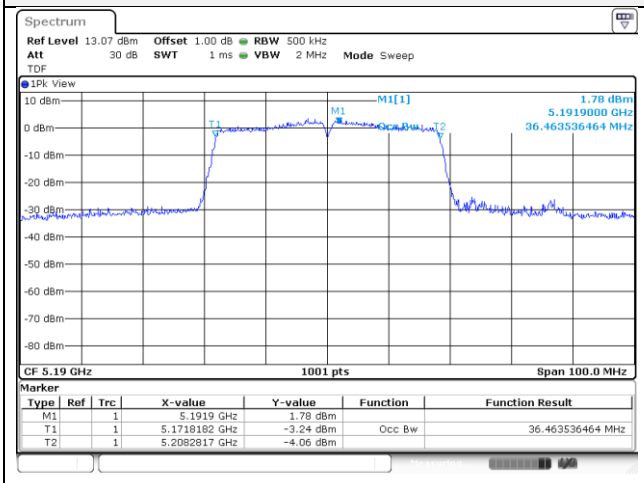
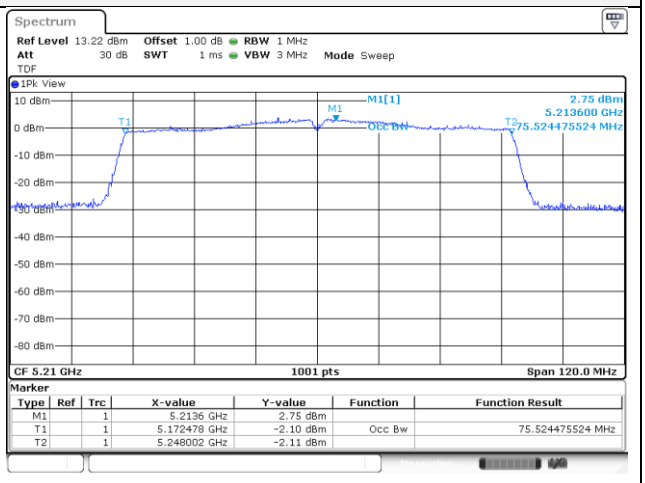


UNII-1 / 802.11ac VHT80 / 5 210 ㎒



UNII-1 / 802.11n HT40 / 5 230 ㎒

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