

RF TEST REPORT

Test Equipment : LG Smart Thermostat
Model Name(HVIN) : TMCTAW5W
FCC ID : 2BO3L-TMCTAW5W
IC : 2703N-TMCTAW5W
Date of receipt : 2026-06-08
Test duration : 2026-06-18 ~ 2026-08-12
Date of issue : 2026-08-12

Applicant(FCC) : LG Electronics Inc.
222 LG-ro, Jinwi-myeon, Pyeongtaek-si
Gyeonggi-do 17709, South Korea
Applicant(IC) : LG Electronics Inc.
170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si
Gyeongsangnam-do 51533, Korea (Republic Of)
Test Laboratory : Lab-T, Inc.
2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si
Gyeonggi-do 17036, Republic of Korea
Test specification : FCC Part 15 Subpart E 15.407
RSS-247 Issue 4 (2025-07), RSS-GEN Issue 5 A2 (2021-02)
RF Output Power : 18.82 dBm
Test result : Pass

The above equipment was tested by Lab-T Testing Laboratory for compliance with the requirements of FCC, IC Rules and Regulations.
The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.
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This test report is not related to KOLAS.

Tested by:



Engineer
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1. Revision history

Test Report No.	Date	Description
TRRFCC26-0010	2026-07-28	Initial issue
TRRFCC26-0010(1)	2026-08-12	Conducted Emission test added

2. Information

2.1 Applicant Information(FCC)

Applicant name	LG Electronics Inc.
Address	222 LG-ro, Jinwi-myeon, Pyeongtaek-si Gyeonggi-do 17709, South Korea
Telephone No.	+82-31-8066-5538
Person in charge	Yongdeok Kwon / DL-FCC-Admin@lge.com
Manufacturer	LG Electronics Inc.
Address	170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si Gyeongsangnam-do 51533, Korea (Republic Of)
Factory	HYUNDAI HT GLOBAL COMPANY LIMITED
Address	Lot M, Binh Xuyen Industrial Zone, Binh Nguyen Commune Phu Tho Province, Vietnam

2.2 Applicant Information (IC)

Applicant name	LG Electronics Inc.
Address	170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si Gyeongsangnam-do 51533, Korea (Republic Of)
Telephone No.	+82-10-7677-9047
Person in charge	Hoseong Jang / hoseong.jang@lge.com
Manufacturer	LG Electronics Inc.
Address	170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si Gyeongsangnam-do 51533, Korea (Republic Of)
Factory	HYUNDAI HT GLOBAL COMPANY LIMITED
Address	Lot M, Binh Xuyen Industrial Zone, Binh Nguyen Commune Phu Tho Province, Vietnam

2.3 Test Laboratory information

Corporate name	Lab-T, Inc.
Representative	Duke (Jongyoung) Kim
Address	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Republic of Korea
FCC & IC MRA Designation No.	KR0159
ISED No.	22000
Telephone	+82-31-322-6767
Fax	+82-31-322-6768
E-mail	info@lab-t.net

2.4 Test Location

Test Site	used	Address
Building L	☒	2182-40 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Republic of Korea
Building T	☒	2182-42 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Republic of Korea
Building A	☐	2182-44 Baegok-daero, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 17036, Republic of Korea

3. Information About Test Equipment

3.1 Equipment Information

Equipment type	LG Smart Thermostat
Equipment model name	TMCTAW5W
Frequency range	5 180 MHz ~ 5 825 MHz
Modulation type	OFDM
Power supply	AC 24 V
H/W version	1.0
S/W version	1.1.00

Note 1 : The above EUT information was declared by the manufacturer.

3.2 Antenna Information

Type	Model No.	Gain		Note.
		5 150 MHz ~ 5 350 MHz	5 470 MHz ~ 5 850 MHz	
Chip antenna	AMAN1003015ST12	0.10 dBi	3.09 dBi	-

3.3 Test frequency

Test mode	Test frequency (MHz)			
	Band	Lowest Frequency	Middle Frequency	Highest Frequency
802.11a /802.11n(HT20) /802.11ac(VHT20)	5 150 ~ 5 250	5 180	5 200	5 240
	5 250 ~ 5 350	5 260	5 280	5 320
	5 470 ~ 5 725	5 500	5 580	5 720
	5 725 ~ 5 850	5 745	5 785	5 825

3.4 Worst-case

802.11a	6 Mbps	802.11ac(VHT20)	MCS0
802.11n(HT20)	MCS0		

Note1 : The power measurement has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

3.5 Tested Companion Device Information

Type	Manufacturer	Model	Note
Access Point	DASAN Zhone Solutions, Inc.	H680GM	DFS

3.6 Operating conditions for the EUT

Firmware state		1.1.00
Test software name(version)		Labtool (2.0.0.49)
Test power setting		5 150 ~ 5 250 : 18 5 250 ~ 5 350 : 18 5 470 ~ 5 725 : 16 5 725 ~ 5 850 : 17
Serial number (Setup mode)	EUT #1	603HTZS00309 (Conducted)
	EUT #2	603HTPP00328 (Radiated Emission)

4. Test Report

4.1 Summary

FCC Part 15E 407 / RSS-247				
FCC Rule	IC Rule	Parameter	Clause	Status
Transmitter Requirements				
15.203 15.407(a)	RSS-GEN 6.8	Antenna Requirement	4.3.1	C
15.407(a)	RSS-247 7.3.1.2 RSS-247 7.3.2.2	Maximum Conducted Output Power	4.3.2	C
15.407(a)	RSS-247 7.3.3.2 RSS-247 7.3.4.3	Maximum Power Spectral Density	4.3.3	C
15.407(a),(e)	-	Emission Bandwidth	4.3.4	C
-	RSS-GEN 6.7	Occupied Bandwidth	4.3.4	C
15.407(g)	RSS-GEN 6.11	Frequency Stability	4.3.5	C
15.407(b) 15.205(a) 15.209(a)	RSS-247 7.3.1.3 RSS-247 7.3.2.3 RSS-247 7.3.3.3 RSS-247 7.3.4.4	Radiated Emission, Band Edge and Restricted bands	4.3.6	C
15.207(a) 15.407(b)(9)	RSS-GEN 8.8	Conducted Emissions	4.3.7	C
15.407(h)	RSS-247 7.3.6	Dynamic Frequency Selection	4.3.8	C
NOTE 1 : C = Comply N/C = Not Comply N/T = Not Tested N/A = Not Applicable				

* The general test methods used to test this device is ANSI C63.10:2020+Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024

4.2 Measurement Uncertainty

Mesurement items	Expanded Uncertainty	
RF Output Power	1.16 dB	(The confidence level is about 95 %, $k=2$)
Power Spectral Density	1.47 dB	(The confidence level is about 95 %, $k=2$)
Occupied Channel Bandwidth	13.15 kHz	(The confidence level is about 95 %, $k=2$)
Conducted Spurious Emissions	0.48 dB	(The confidence level is about 95 %, $k=2$)
Radiated Spurious Emissions (1 GHz under)	4.85 dB	(The confidence level is about 95 %, $k=2$)
Radiated Spurious Emissions (Above 1 GHz)	4.39 dB	(The confidence level is about 95 %, $k=2$)
Conducted Emissions	2.42 dB	(The confidence level is about 95 %, $k=2$)

4.3 Transmitter Requirements

4.3.1 Antenna Requirement

4.3.1.1 Regulation

According to §15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.407(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.

According to §RSS-GEN 6.8 The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

4.3.1.2 Result

Comply

(The transmitter has a Internal Chip Antenna. The directional peak gain of the antenna is 3.09 dBi.)

4.3.1.3 Measurement data

Antenna	Directional Gain For Power(dBi)	Directional Gain For PSD(dBi)	Power Limit Reduction(dB)	PSD Limit Reduction(dB)
Band	5150 ~ 5350			
Chip antenna	0.10	0.10	0.00	0.00
Band	5470 ~ 5850			
Chip antenna	3.09	3.09	0.00	0.00

4.3.2 Maximum Conducted Output Power

4.3.2.1 Regulation

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

According to §RSS-247 7.3.1.2 For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, 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 MHz band.

According to §15.407(a)(2) and RSS-247 7.3.2.2, RSS-247 7.3.3.2 For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-247 7.3.2.2, RSS-247 7.3.3.2 For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, 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 mW 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 §15.407(a)(3) and RSS-247 7.3.4.3 For the band 5.725-5.85 GHz, 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 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi 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.

4.3.2.2 Measurement Procedure

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

4.3.2.2.1 Measurement using a Power Meter (PM)

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

The EUT is configured to transmit continuously or to transmit with a constant duty cycle.

At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.

The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

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

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

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

4.3.2.3 Result

Comply (measurement data : refer to the next page)

4.3.2.4 Measurement data

Test mode : 802.11a

Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
5 180	18.82	76.21	1000.00
5 200	18.64	73.11	1000.00
5 240	18.35	68.39	1000.00
5 260	18.70	74.13	250.00
5 280	18.51	70.96	250.00
5 320	18.25	66.83	250.00
5 500	18.28	67.30	250.00
5 580	18.21	66.22	250.00
5 720	18.56	71.78	250.00
5 745	18.00	63.10	1000.00
5 785	17.97	62.66	1000.00
5 825	17.24	52.97	1000.00

Test mode : 802.11n(HT20)

Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
5 180	18.82	76.21	1000.00
5 200	18.66	73.45	1000.00
5 240	18.34	68.23	1000.00
5 260	18.69	73.96	250.00
5 280	18.55	71.61	250.00
5 320	18.24	66.68	250.00
5 500	18.22	66.37	250.00
5 580	18.19	65.92	250.00
5 720	16.41	71.94	250.00
5 745	17.93	62.09	1000.00
5 785	18.03	63.53	1000.00
5 825	17.23	52.84	1000.00

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result : Measured Value + Duty cycle Factor

Note 4 : Duty cycle Factor : $10 \cdot \log(1/(\text{on-time}/\text{Period}))$ refer to 4.3.6.7

Test mode : 802.11ac(VHT20)

Freq. (MHz)	Result (dBm)	Result (mW)	Limit (mW)
5 180	18.82	77.09	1000.00
5 200	18.66	73.96	1000.00
5 240	18.34	68.55	1000.00
5 260	18.69	74.30	250.00
5 280	18.55	72.28	250.00
5 320	18.24	66.22	250.00
5 500	18.22	67.14	250.00
5 580	18.19	65.61	250.00
5 720	18.57	72.28	250.00
5 745	17.93	62.37	1000.00
5 785	18.03	63.24	1000.00
5 825	17.23	53.09	1000.00

Note 1 : refer to 4.3.1 for information on limit reduction.

Note 2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.

Note 3 : Result : Measured Value + Duty cycle Factor

Note 4 : Duty cycle Factor : $10 \cdot \log(1/(\text{on-time}/\text{Period}))$ refer to 4.3.6.7

4.3.2.5 Measurement data_E.I.R.P_IC

Test mode : 802.11a

Freq. (MHz)	Output Power (dBm)	Result eirp (dBm)	Result eirp (mW)	Limit (mW)
5 180	18.82	18.92	77.98	200.00
5 200	18.64	18.74	74.82	200.00
5 240	18.35	18.45	69.98	200.00
5 260	18.70	18.80	75.86	1000.00
5 300	18.51	18.61	72.61	1000.00
5 320	18.25	18.35	68.39	1000.00
5 500	18.28	21.37	137.09	1000.00
5 580	18.21	21.30	134.90	1000.00
5 720	18.56	21.65	146.22	1000.00
5 745	18.00	21.09	128.53	4000.00
5 785	17.97	21.06	127.64	4000.00
5 825	17.24	20.33	107.89	4000.00

Test mode : 802.11n(HT20)

Freq. (MHz)	Output Power (dBm)	Result eirp (dBm)	Result eirp (mW)	Limit (mW)
5 180	18.82	18.92	77.98	200.00
5 200	18.66	18.76	75.16	200.00
5 240	18.34	18.44	69.82	200.00
5 260	18.69	18.79	75.68	1000.00
5 300	18.55	18.65	73.28	1000.00
5 320	18.24	18.34	68.23	1000.00
5 500	18.22	21.31	135.21	1000.00
5 580	18.19	21.28	134.28	1000.00
5 720	16.41	21.66	146.55	1000.00
5 745	17.93	21.02	126.47	4000.00
5 785	18.03	21.12	129.42	4000.00
5 825	17.23	20.32	107.65	4000.00

Note 1 : refer to 4.3.1 for information on limit reduction and Antenna gain

Note 2 : Result eirp(dBm) : Output Power(dBm) + Antenna gain(dBi)

Test mode : 802.11ac(VHT20)

Freq. (MHz)	Output Power (dBm)	Result eirp (dBm)	Result eirp (mW)	Limit (mW)
5 180	18.82	18.97	78.89	200.00
5 200	18.66	18.79	75.68	200.00
5 240	18.34	18.46	70.15	200.00
5 260	18.69	18.81	76.03	1000.00
5 300	18.55	18.69	73.96	1000.00
5 320	18.24	18.31	67.76	1000.00
5 500	18.22	21.36	136.77	1000.00
5 580	18.19	21.26	133.66	1000.00
5 720	18.57	21.68	147.23	1000.00
5 745	17.93	21.04	127.06	4000.00
5 785	18.03	21.10	128.82	4000.00
5 825	17.23	20.34	108.14	4000.00

Note 1 : refer to 4.3.1 for information on limit reduction and Antenna gain

Note 2 : Result eirp(dBm) : Output Power(dBm) + Antenna gain(dBi)

4.3.3 Maximum Power Spectral Density(PSD)

4.3.3.1 Regulation

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

According to §RSS-247 7.3.1.2 For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, 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 MHz band.

According to §15.407(a)(2) and RSS-247 7.3.2.2, RSS-247 7.3.3.2 For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a)(3) and RSS-247 7.3.4.3 For the band 5.725-5.85 GHz, 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 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi 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.

4.3.3.2 Measurement Procedure

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

4.3.3.2.1 Maximum Power Spectral Density (PSD)

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.

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 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 MHz reference bandwidth.

5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “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 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3$ RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ 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.

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

4.3.3.3 Result

Comply (measurement data : refer to the next page)

4.3.3.4 Measurement data

Test mode : 802.11a

Freq. (MHz)	Measured (dBm/MHz)	Result (dBm/MHz)	Limit (dBm/MHz)
5 180	6.46	6.46	17.00
5 200	6.65	6.65	17.00
5 240	6.86	6.86	17.00
5 260	6.92	6.92	11.00
5 280	6.77	6.77	11.00
5 320	6.25	6.25	11.00
5 500	6.56	6.56	11.00
5 580	6.46	6.46	11.00
5 720	6.87	6.87	11.00
5 745	3.40	3.40	30.00
5 785	3.56	3.56	30.00
5 825	2.60	2.60	30.00

Test mode : 802.11n(HT20)

Freq. (MHz)	Measured (dBm/MHz)	Result (dBm/MHz)	Limit (dBm/MHz)
5 180	6.62	6.62	17.00
5 200	6.80	6.80	17.00
5 240	6.50	6.50	17.00
5 260	6.55	6.55	11.00
5 280	6.45	6.45	11.00
5 320	5.96	5.96	11.00
5 500	6.33	6.33	11.00
5 580	6.01	6.01	11.00
5 720	6.28	6.28	11.00
5 745	2.81	2.81	30.00
5 785	3.09	3.09	30.00
5 825	2.46	2.46	30.00

NOTE1 : refer to 4.3.1 for information on limit reduction.
 NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
 NOTE3 : Duty cycle Factor : $10 \cdot \log(1/(\text{on-time}/\text{Period}))$ refer to 4.3.6.7
 NOTE4 : Result : Measured Value + Duty cycle Factor
 NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
 5725MHz ~ 5850MHz : dBm/500kHz

Test mode : 802.11ac(VHT20)

Freq. (MHz)	Measured (dBm/MHz)	Result (dBm/MHz)	Limit (dBm/MHz)
5 180	6.47	6.47	17.00
5 200	6.72	6.72	17.00
5 240	6.44	6.44	17.00
5 260	6.72	6.72	11.00
5 280	6.48	6.48	11.00
5 320	6.03	6.03	11.00
5 500	6.44	6.44	11.00
5 580	6.03	6.03	11.00
5 720	6.17	6.17	11.00
5 745	3.02	3.02	30.00
5 785	2.76	2.76	30.00
5 825	2.23	2.23	30.00

NOTE1 : refer to 4.3.1 for information on limit reduction.
 NOTE2 : We took the insertion loss of the cable loss into consideration within the measuring instrument.
 NOTE3 : Duty cycle Factor : $10 \cdot \log(1/(\text{on-time}/\text{Period}))$ refer to 4.3.6.7
 NOTE4 : Result : Measured Value + Duty cycle Factor
 NOTE5 : 5150MHz ~ 5725MHz : dBm/MHz
 5725MHz ~ 5850MHz : dBm/500kHz

4.3.3.5 Measurement data_E.I.R.P_IC

Test mode : 802.11a

Freq. (MHz)	PSD (dBm/MHz)	Result PSD eirp (dBm/MHz)	Limit (dBm/MHz)
5180	6.46	6.56	10.00
5200	6.65	6.75	10.00
5240	6.86	6.96	10.00

Test mode : 802.11n(HT20)

Freq. (MHz)	PSD (dBm/MHz)	Result PSD eirp (dBm/MHz)	Limit (dBm/MHz)
5180	6.62	6.72	10.00
5200	6.80	6.90	10.00
5240	6.50	6.60	10.00

Test mode : 802.11ac(VHT20)

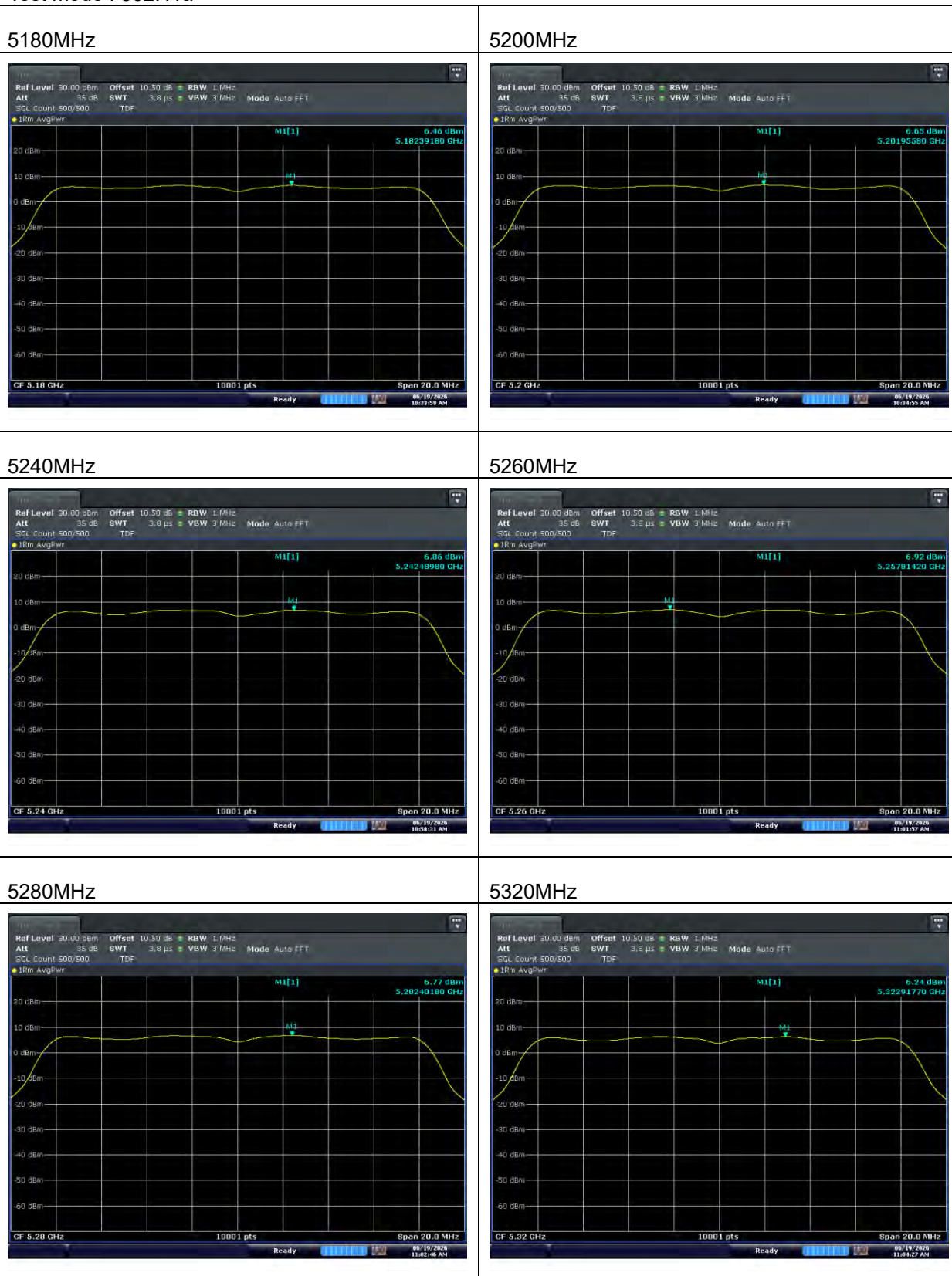
Freq. (MHz)	PSD (dBm/MHz)	Result PSD eirp (dBm/MHz)	Limit (dBm/MHz)
5180	6.47	6.57	10.00
5200	6.72	6.82	10.00
5240	6.44	6.54	10.00

Note 1 : refer to 4.3.1 for information on Antenna gain

Note 2 : Result eirp(dBm) : PSD(dBm) + Antenna gain(dBi)

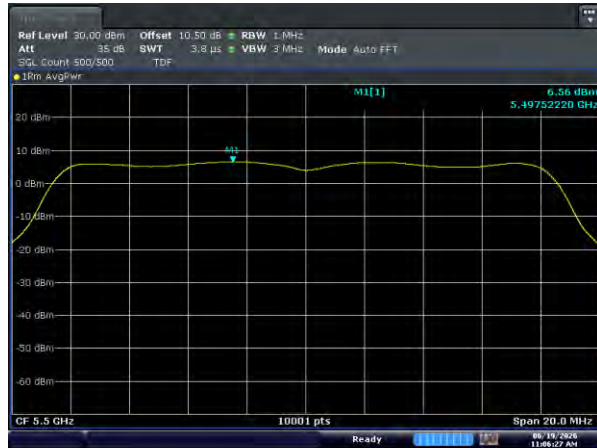
4.3.3.6 Test Plot

Test mode : 802.11a

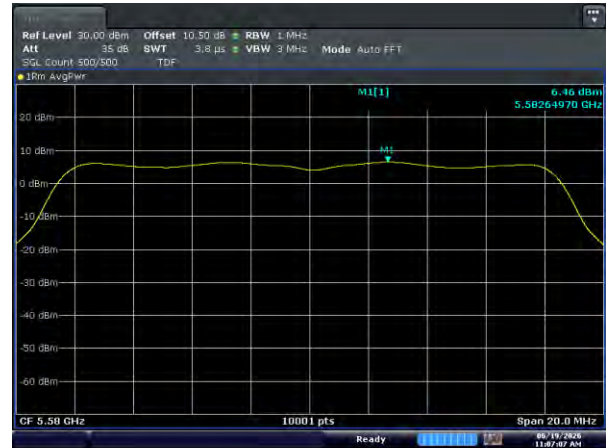


Test mode : 802.11a

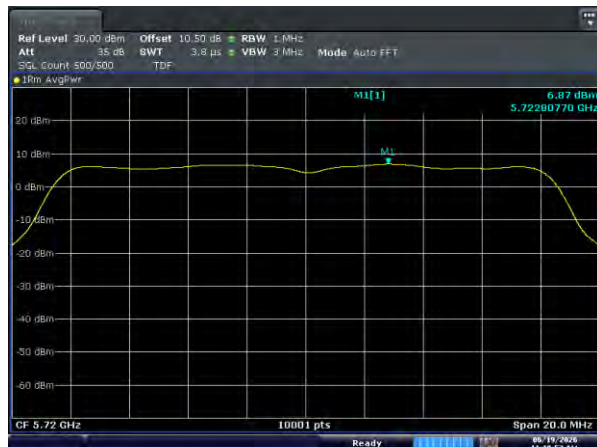
5500MHz



5580MHz



5720MHz



5745MHz



5785MHz

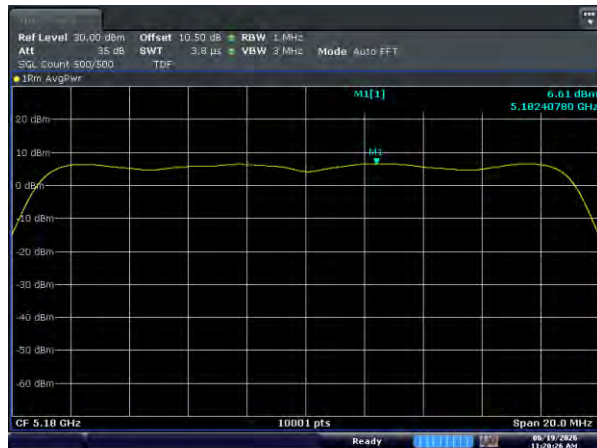


5825MHz

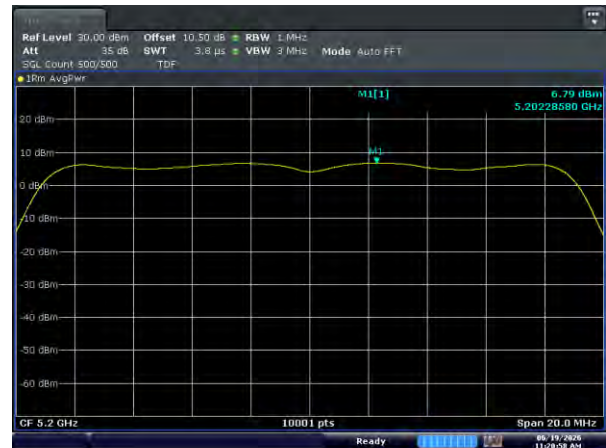


Test mode : 802.11n(HT20)

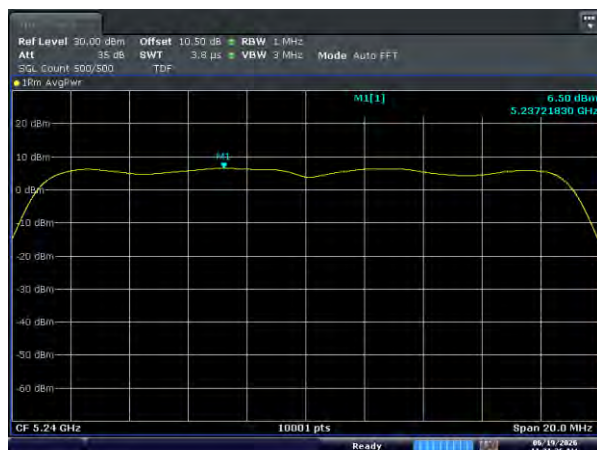
5180MHz



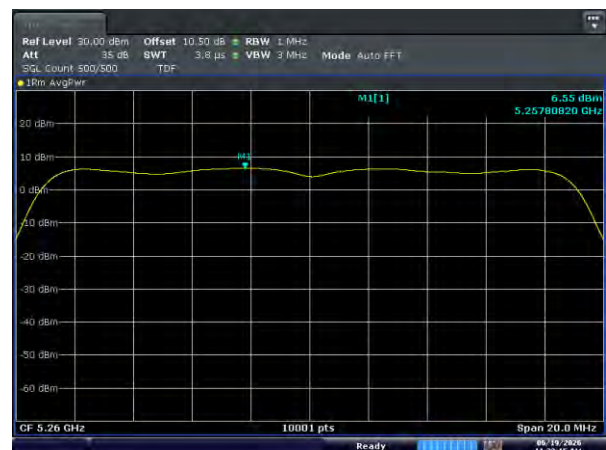
5200MHz



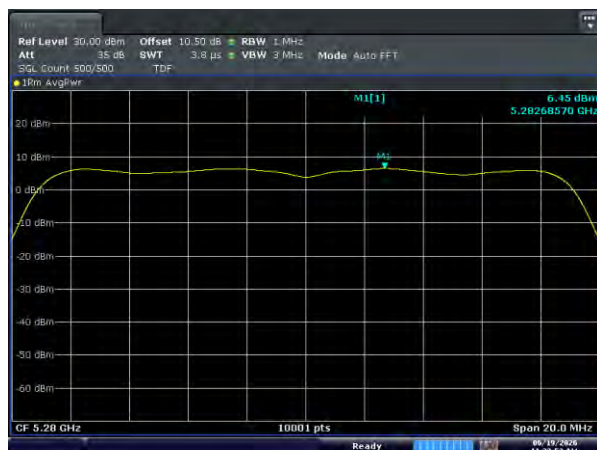
5240MHz



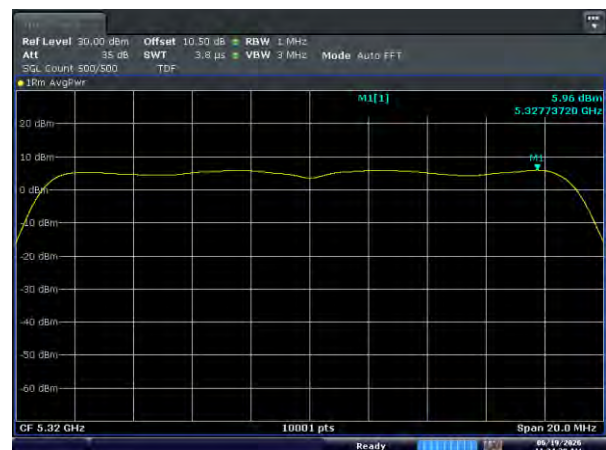
5260MHz



5280MHz

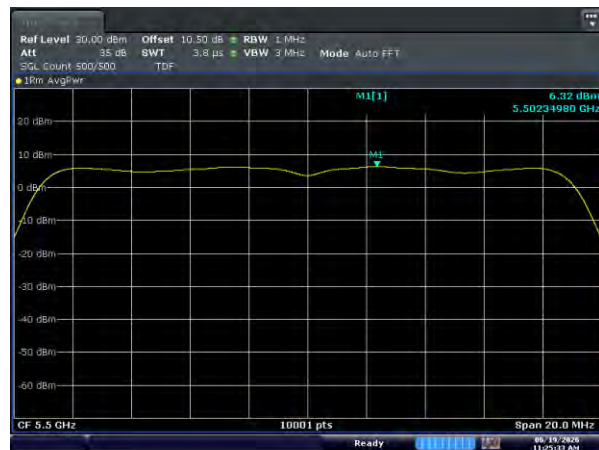


5320MHz

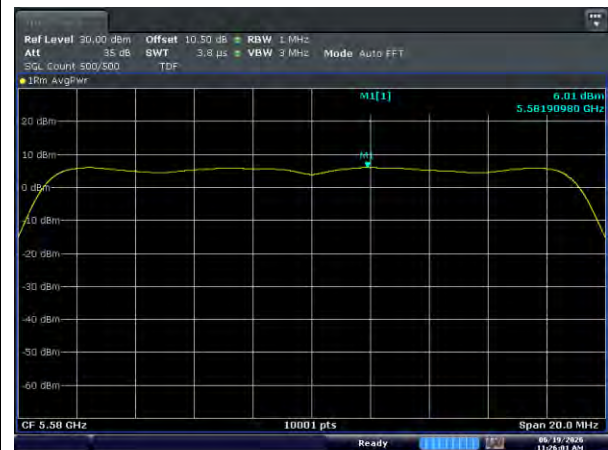


Test mode : 802.11n(HT20)

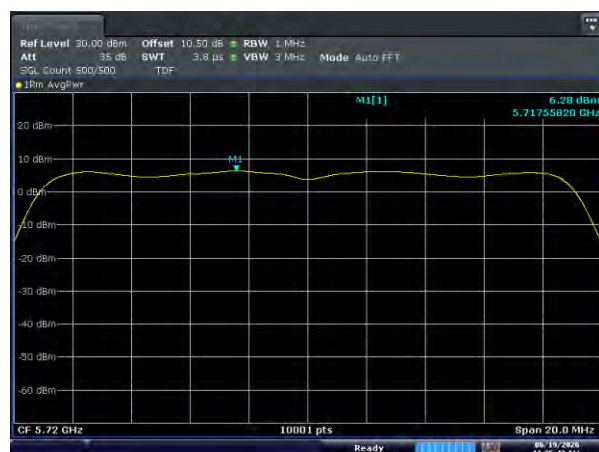
5500MHz



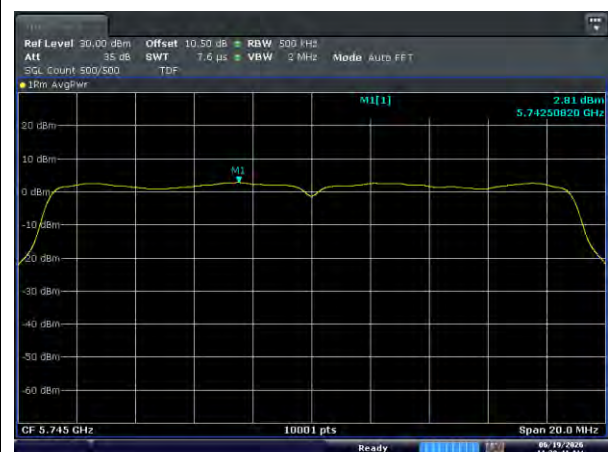
5580MHz



5720MHz



5745MHz



5785MHz

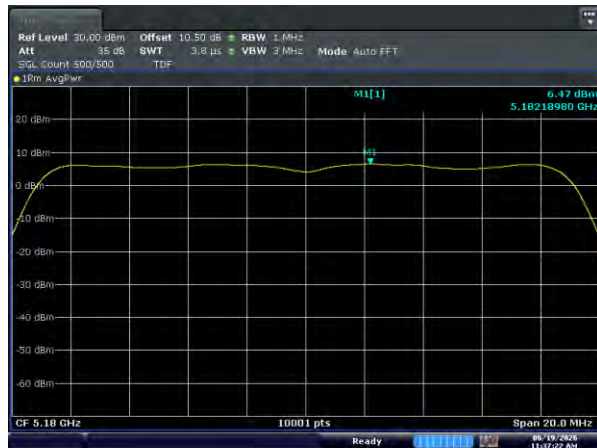


5825MHz

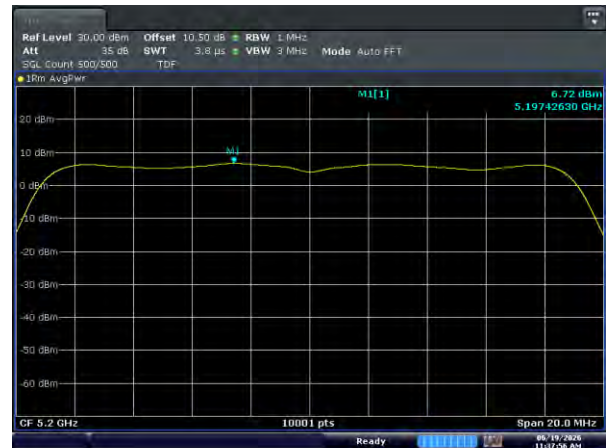


Test mode : 802.11ac(VHT20)

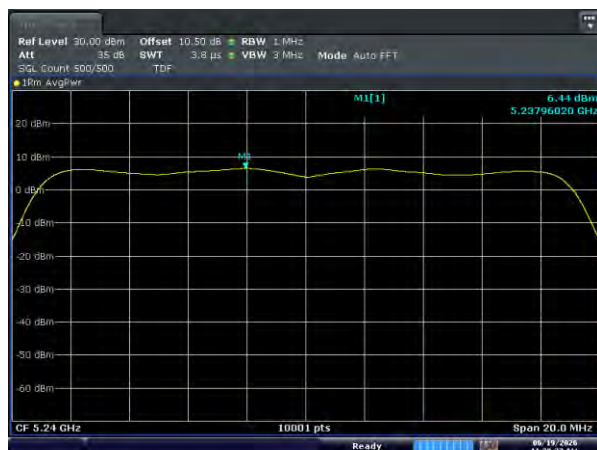
5180MHz



5200MHz



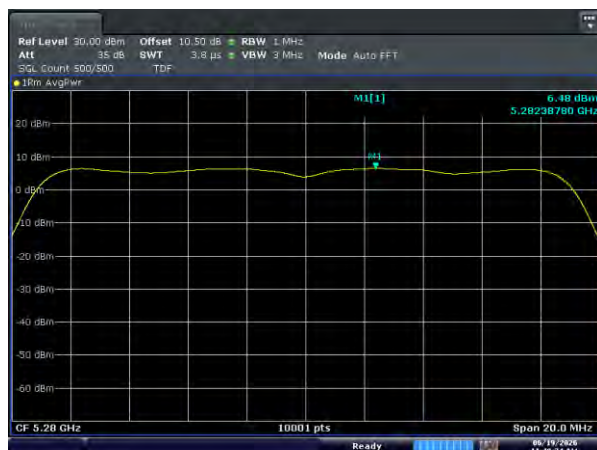
5240MHz



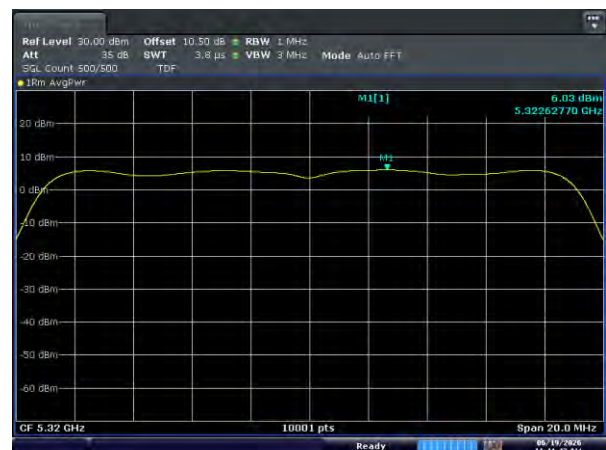
5260MHz



5280MHz

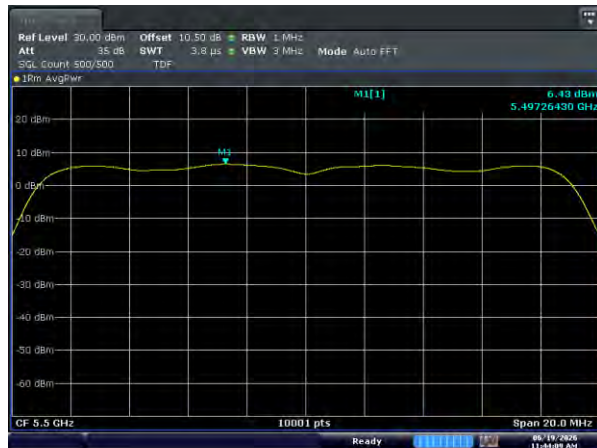


5320MHz

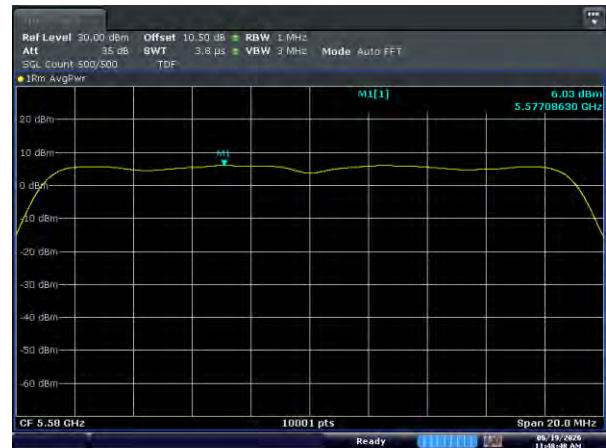


Test mode : 802.11ac(VHT20)

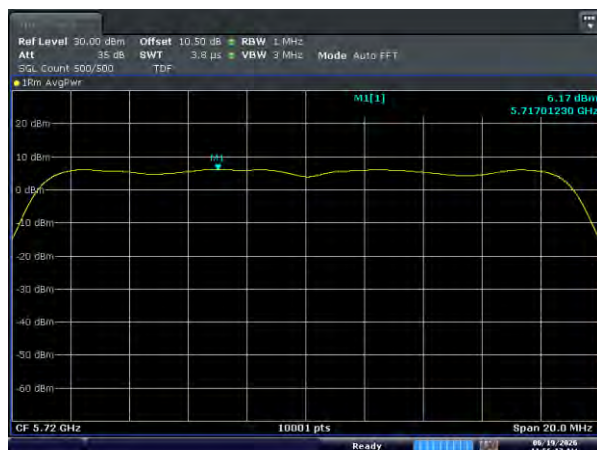
5500MHz



5580MHz



5720MHz



5745MHz



5785MHz



5825MHz



4.3.4 Emission Bandwidth

4.3.4.1 Regulation

According to §15.403 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 dB 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 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

According to §RSS-GEN 6.7 The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the “x dB bandwidth” is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

4.3.4.2 Measurement Procedure

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

4.3.4.2.1 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 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%.

4.3.4.2.2 Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ 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 associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB 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.

4.3.4.2.3 99% Occupied Bandwidth

The following procedure shall be used for measuring (99%) power 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 $\geq 3 \times$ 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.

4.3.4.3 Result

Comply (measurement data : refer to the next page)

4.3.4.4 Emission Bandwidth Measurement data

Test mode : 802.11a

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	20.43	20.47	20.24
5 250 ~ 5 350	20.31	20.37	20.55
5 470 ~ 5 725	19.93	20.34	20.58
5 725 ~ 5 850	16.33	16.33	16.31

Test mode : 802.11n(HT20)

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	20.60	20.44	20.58
5 250 ~ 5 350	20.44	20.35	20.41
5 470 ~ 5 725	20.55	20.55	20.70
5 725 ~ 5 850	16.94	16.79	16.80

Test mode : 802.11ac(VHT20)

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	20.69	20.47	20.48
5 250 ~ 5 350	20.41	20.31	20.75
5 470 ~ 5 725	20.27	20.65	20.83
5 725 ~ 5 850	17.28	17.58	17.31

4.3.4.5 99% Occupied bandwidth Measurement data

Test mode : 802.11a

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	16.63	16.61	16.65
5 250 ~ 5 350	16.70	16.59	16.66
5 470 ~ 5 725	16.61	16.59	16.65
5 725 ~ 5 850	16.62	16.63	16.65

Test mode : 802.11n(HT20)

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	17.65	17.61	17.64
5 250 ~ 5 350	17.61	17.63	17.71
5 470 ~ 5 725	17.62	17.60	17.60
5 725 ~ 5 850	17.61	17.62	17.61

Test mode : 802.11ac(VHT20)

Band	Lowest Frequency	Middle Frequency	Highest Frequency
5 150 ~ 5 250	17.65	17.59	17.64
5 250 ~ 5 350	17.59	17.61	17.63
5 470 ~ 5 725	17.61	17.60	17.64
5 725 ~ 5 850	17.62	17.60	17.59

4.3.4.6 Emission Bandwidth Test Plot

Test mode : 802.11a

5180MHz



5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11a

5500MHz



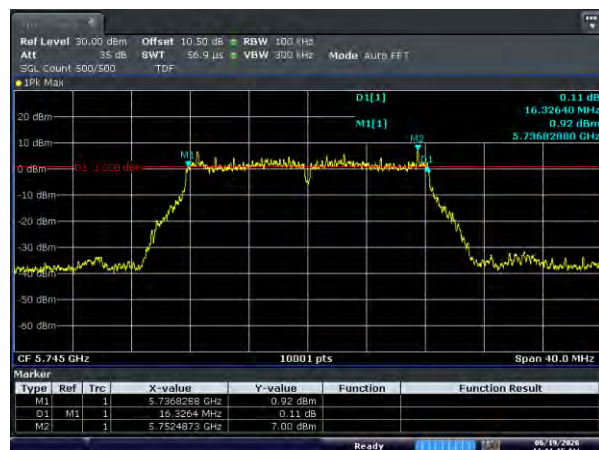
5580MHz



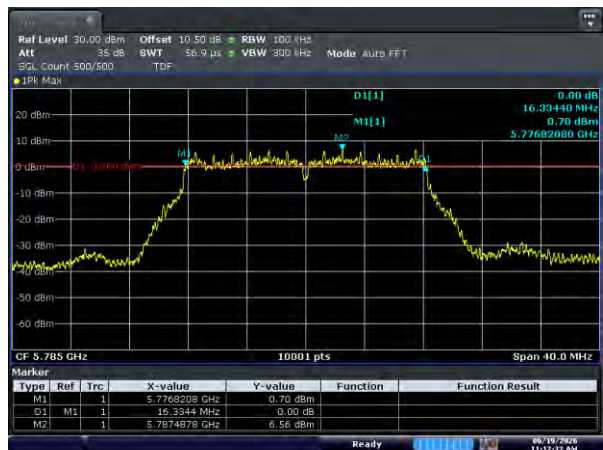
5720MHz



5745MHz



5785MHz



5825MHz



Test mode : 802.11n(HT20)

5180MHz



5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11n(HT20)

5500MHz



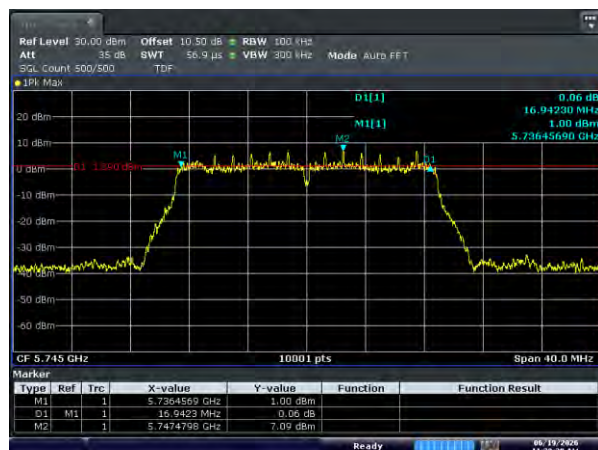
5580MHz



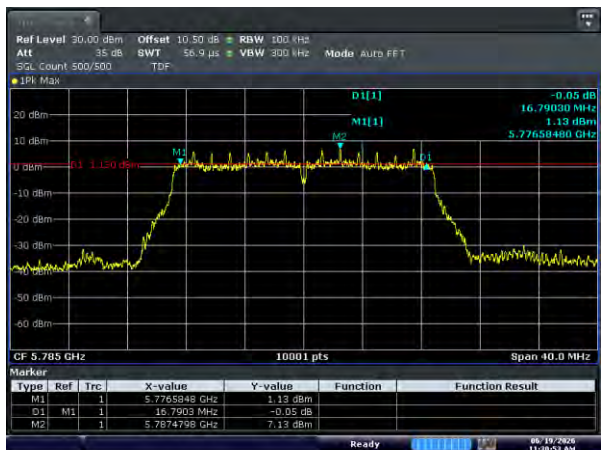
5720MHz



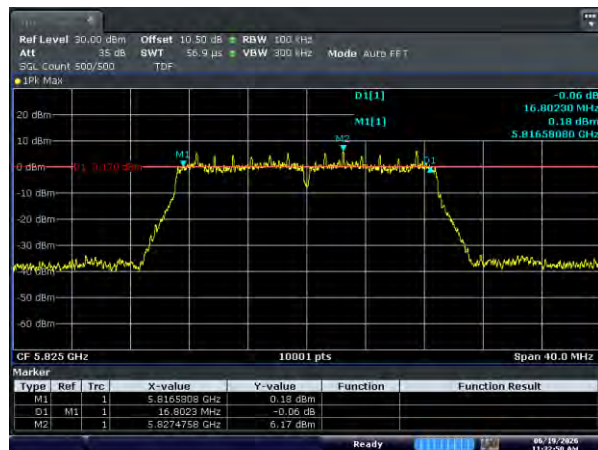
5745MHz



5785MHz



5825MHz



Test mode : 802.11ac(VHT20)

5180MHz



5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11ac(VHT20)

5500MHz



5580MHz



5720MHz



5745MHz



5785MHz



5825MHz



4.3.4.7 99% Occupied Bandwidth Test Plot

Test mode : 802.11a

5180MHz



5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11a

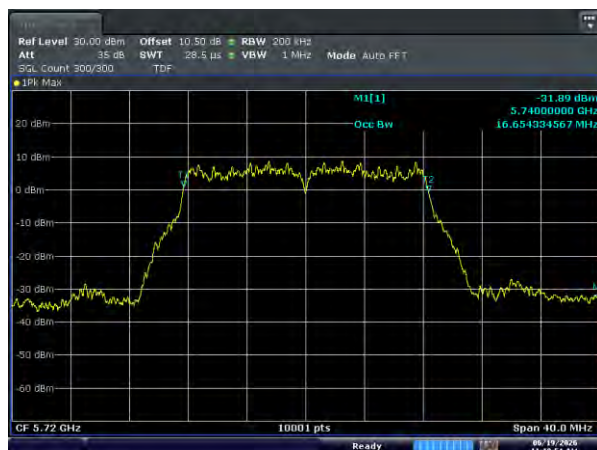
5500MHz



5580MHz



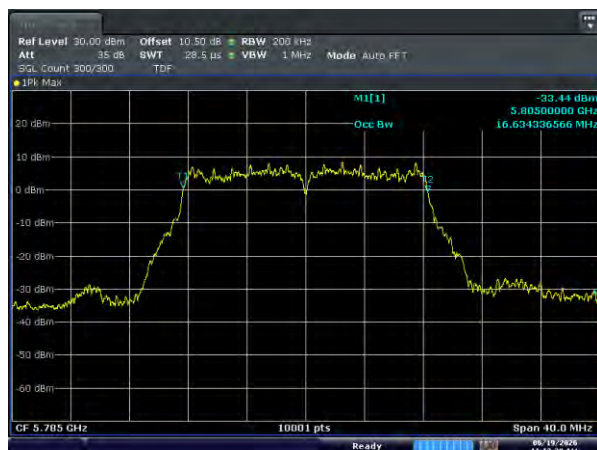
5720MHz



5745MHz



5785MHz



5825MHz



Test mode : 802.11n(HT20)

5180MHz



5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11n(HT20)

5500MHz



5580MHz



5720MHz



5745MHz



5785MHz



5825MHz



Test mode : 802.11ac(VHT20)

5180MHz



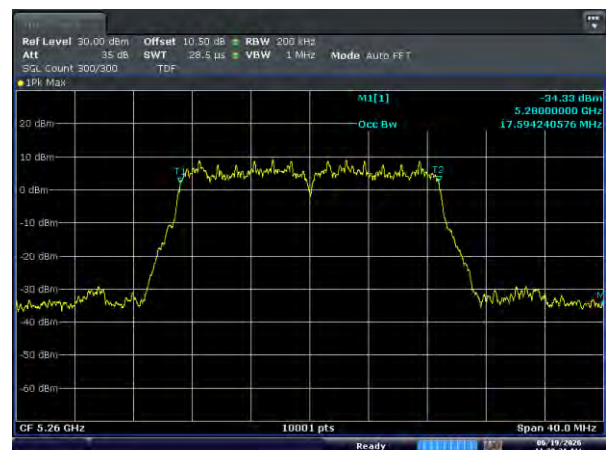
5200MHz



5240MHz



5260MHz



5280MHz



5320MHz



Test mode : 802.11ac(VHT20)

5500MHz



5580MHz



5720MHz



5745MHz



5785MHz



5825MHz



4.3.5 Frequency Stability

4.3.5.1 Regulation

According to §15.407(i) (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.

According to §RSS-GEN 6.11 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.

When the measurement method of transmitter frequency stability is not stated in the applicable RSS or reference standards, the following conditions apply:

- (a)The reference temperature for radio transmitters is +20°C (+68°F).
- (b)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 shall be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used.
- (c)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 and frequency stability shall be measured under the conditions specified below for licensed and licence-exempt devices, unless specified otherwise in the applicable RSS. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement.

4.3.5.2 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.

4.3.5.3 Result

Comply (measurement data : refer to the next page)

4.3.5.4 Measurement data

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 180 MHz	-20	5 179 841 900	-0.003
	-10	5 179 994 350	0.000
	0	5 179 932 450	-0.001
	10	5 180 064 950	0.001
	20	5 179 963 750	-0.001
	30	5 180 060 600	0.001
	40	5 179 976 200	0.000
	50	5 179 944 400	-0.001
	Voltage(%)		
	85	5 179 913 150	-0.002
	115	5 180 015 600	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 200 MHz	-20	5 200 037 450	0.001
	-10	5 200 135 650	0.003
	0	5 200 031 250	0.001
	10	5 200 056 200	0.001
	20	5 200 013 100	0.000
	30	5 200 075 650	0.001
	40	5 199 932 450	-0.001
	50	5 199 891 850	-0.002
	Voltage(%)		
	85	5 199 951 850	-0.001
	115	5 200 194 350	0.004

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 240 MHz	-20	5 239 940 650	-0.001
	-10	5 239 906 900	-0.002
	0	5 239 981 900	0.000
	10	5 239 915 600	-0.002
	20	5 240 142 500	0.003
	30	5 240 058 150	0.001
	40	5 239 930 650	-0.001
	50	5 239 883 150	-0.002
	Voltage(%)		
	85	5239 988 700	0.000
	115	5239 928 100	-0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 260 MHz	-20	5 259 959 350	-0.001
	-10	5 259 798 100	-0.004
	0	5 259 872 500	-0.002
	10	5 260 083 100	0.002
	20	5 259 970 000	-0.001
	30	5 259 901 200	-0.002
	40	5 259 701 850	-0.006
	50	5 260 023 700	0.000
	Voltage(%)		
	85	5 259 857 450	-0.003
	115	5 260 008 700	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 280 MHz	-20	5 280 058 100	0.001
	-10	5 279 944 400	-0.001
	0	5 279 851 900	-0.003
	10	5 280 031 200	0.001
	20	5 279 978 700	0.000
	30	5 279 951 250	-0.001
	40	5 280 094 350	0.002
	50	5 279 956 250	-0.001
	Voltage(%)		
	85	5 279 851 200	-0.003
	115	5 279 972 500	-0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 320 MHz	-20	5 319 971 900	-0.001
	-10	5 319 960 650	-0.001
	0	5 320 017 500	0.000
	10	5 319 914 400	-0.002
	20	5 319 944 350	-0.001
	30	5 320 095 650	0.002
	40	5 319 929 350	-0.001
	50	5 320 084 950	0.002
	Voltage(%)		
	85	5 320 105 650	0.002
	115	5 320 018 750	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 500 MHz	-20	5 499 871 900	-0.002
	-10	5 499 922 450	-0.001
	0	5 499 984 350	0.000
	10	5 500 117 450	0.002
	20	5 499 911 200	-0.002
	30	5 499 918 700	-0.001
	40	5 499 904 350	-0.002
	50	5 500 043 700	0.001
	Voltage(%)		
	85	5 499 998 100	0.000
	115	5 500 014 400	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 580 MHz	-20	5 579 993 750	0.000
	-10	5 580 123 100	0.002
	0	5 579 935 000	-0.001
	10	5 579 964 950	-0.001
	20	5 579 994 350	0.000
	30	5 580 013 700	0.000
	40	5 580 053 750	0.001
	50	5 580 001 200	0.000
	Voltage(%)		
	85	5 579 957 450	-0.001
	115	5 580 131 200	0.002

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 720 MHz	-20	5 720 103 100	0.002
	-10	5 720 024 350	0.000
	0	5 719 996 900	0.000
	10	5 720 050 000	0.001
	20	5 720 099 350	0.002
	30	5 720 023 700	0.000
	40	5 719 920 650	-0.001
	50	5 719 882 450	-0.002
	Voltage(%)		
	85	5 720 022 450	0.000
	115	5 720 016 200	0.000

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 745 MHz	-20	5 744 908 150	-0.002
	-10	5 745 039 400	0.001
	0	5 745 102 500	0.002
	10	5 744 933 750	-0.001
	20	5 745 020 600	0.000
	30	5 745 033 700	0.001
	40	5 744 901 200	-0.002
	50	5 744 991 850	0.000
	Voltage(%)		
	85	5 745 014 350	0.000
	115	5 744 905 650	-0.002

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 785 MHz	-20	5 784 900 650	-0.002
	-10	5 784 973 750	0.000
	0	5 784 998 750	0.000
	10	5 784 995 600	0.000
	20	5 784 972 450	0.000
	30	5 784 981 250	0.000
	40	5 785 073 150	0.001
	50	5 785 019 950	0.000
	Voltage(%)		
	85	5 784 934 950	-0.001
	115	5 784 933 150	-0.001

Test mode : 20 MHz Bandwidth

Frequency (MHz)	Temp (°C)	Center Frequency (Hz)	Tolerance (%)
5 825 MHz	-20	5 825 091 850	0.002
	-10	5 825 074 400	0.001
	0	5 824 929 350	-0.001
	10	5 824 995 000	0.000
	20	5 825 003 100	0.000
	30	5 825 014 350	0.000
	40	5 825 003 150	0.000
	50	5 825 078 750	0.001
	Voltage(%)		
	85	5 824 946 900	-0.001
	115	5 824 940 600	-0.001

4.3.6 Spurious Emission, Band Edge, and Restricted bands

4.3.6.1 Regulation

According to §15.407(b) Undesirable emission limits. Except as shown in paragraph (b)(10) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating solely in the 5.725-5.850 GHz band: 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.

(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

According to §RSS-247 7.3.1.3 For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing DFS (see section 7.3.6) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

According to §RSS-247 7.3.2.3 a) All emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.; or

b) All emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. and its power shall comply with the spectral power density for operation within the band 5150-5250 MHz. The device, except devices installed in vehicles, shall be labelled or include in the user manual the following text "for indoor use only."

According to §RSS-247 7.3.3.3 Equipment operating in the bands 5470-5725 MHz shall comply with the following unwanted emission limits:

- a) for devices with fundamental emissions fully contained within the 5470-5725 MHz band, all unwanted emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz peak e.i.r.p. spectral density.
- b) for devices with bandwidth overlapping the band edge of 5725 MHz, all unwanted emissions shall not exceed -27 dBm/MHz peak e.i.r.p. spectral density at 5850 MHz instead of 5725 MHz.

According to §RSS-247 7.3.4.4 Equipment operating in the band 5725-5850 MHz shall comply with the following peak e.i.r.p. spectral density limits:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

According to §15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

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

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

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

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 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 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 measurement

According to RSS-GEN 8.10(c) Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

MHz	MHz	MHz	GHz
0.009 - 0.110	13.36 – 13.41	960 – 1427	9.0 – 9.2
0.495 - 0.505	16.42 – 16.423	1435 – 1626.5	9.3 – 9.5
2.173 5 - 2.190 5	16.69475 – 16.69525	1645.5 - 1646.5	10.6 – 12.7
3.020 – 3.026	16.80425 - 16.80475	1660 – 1710	13.25 – 13.4
4.125 – 4.128	25.5 – 25.67	1718.8 – 1722.2	14.47 – 14.5
4.17725 – 4.17775	37.5 – 38.25	2200 – 2300	15.35 – 16.2
4.20725 – 4.20775	73 – 74.6	2310 - 2390	17.7 – 21.4
5.677 – 5.683	74.8 – 75.2	2483.5 – 2500	22.01 – 23.12
6.215 – 6.218	108 – 138	2655 – 2900	23.6 – 24.0
6.26775 – 6.26825	149.9 – 150.05	3260 – 3267	31.2 – 31.8
6.31175 – 6.31225	156.52475 – 156.52525	3332 – 3339	36.43 – 36.5
8.291 – 8.294	156.7 – 156.9	3345.8 - 3358	Above 38.6
8.363 – 8.366	162.0125 – 167.17	3500 – 4400	-
8.37625 – 8.38675	167.75 – 173.2	4500 – 5150	-

8.41425 – 8.41475	240 – 285	5350 – 5460	-
12.29 – 12.293	322 – 335.4	7250 - 7750	-
12.51975 – 12.52025	399.9 – 410	8025 – 8500	-
12.57675 – 12.57725	608 – 614	-	-

4.3.6.2 Measurement Procedure

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

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).

4.3.6.2.1 Unwanted Emissions in the Restricted Bands & Outside of the Restricted Bands

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

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

(3) At frequencies above 1000 MHz, 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.

(4) Unwanted Emissions that fall Outside of the Restricted Bands

As specified in §15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in §15.407(b)(4)).

However, an out-of-band emission that complies with both the peak and average limits of §15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

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

(i) $EIRP = ((E \cdot d)^2) / 30$

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 dB units, the above equation is equivalent to:

$EIRP[dBm] = E[dB\mu V/m] + 20 \log(d[meters]) - 104.77$

(iii) or, if d is 3 meters:

$EIRP[dBm] = E[dB\mu V/m] - 95.2$

4.3.6.2.2 Radiated Spurious Emissions

- 1) The preliminary and final radiated 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 kHz to 30 MHz using the loop antenna, and from 30 to 1 000 MHz using the TRILOG broadband antenna, and from 1 000 MHz to 40 000 MHz 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) For multiple antennas, the maximum simultaneous operating conditions were declared the worst case condition. The test was performed under the worst condition.

NOTE1 : The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 GHz.

NOTE2 : The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.

The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz(1/T) for Average detection (AV) at frequency above 1 GHz. (where T = pulse width)

4.3.6.3 Note

- Below 1GHz

Note 1 : Loss : Cable loss - Amp gain

Note 2 : Result : Reading + Ant Factor + Loss

Note 3 : Measured distance : 3 m

- Above 1GHz

Note 1 : Factor : Ant Factor + Cable loss - Amp gain + Distance Factor

Note 2 : Peak Result : Reading + Factor

Note 3 : Average Result : Average Reading + Factor + Average Factor

Note 4 : Average Factor : $10\log(1/\text{Duty cycle})$ * Refer to 4.3.6.7

Note 5 : 1G-18GHz Measured distance : 3 m

Note 6 : Above 18GHz Measured distance : 1 m, Distance Factor = $20\log(1/3) = -9.54$

Note 7 : Average measurement did not take place because the peak data did not exceed Average Limit.

Note 8 : Not Detected means that peak data does not exceed the average limit.

4.3.6.4 Result

Comply (measurement data : refer to the next page)

4.3.6.5 Measurement data

- Below 1 GHz

(Worst case : 5GHz(802.11ac(VHT20)))

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
119.95	QP	V	35.20	16.90	-28.50	23.60	43.50	19.90
240.00	QP	V	39.90	17.60	-27.20	30.30	46.00	15.70

- Above 1GHz

Test mode : 802.11a_5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 145.25	PK	V	60.80	-2.90	-	57.90	74.00	16.10
	AV	V	45.30	-2.90	-	42.40	54.00	11.60
5 148.75	PK	H	54.10	-2.90	-	51.20	74.00	22.80
	AV	H	41.30	-2.90	-	38.40	54.00	15.60
10 363.73	PK	V	41.00	7.80	-	48.80	68.20	19.40
10 366.28	PK	H	45.60	7.80	-	53.40	68.20	14.80

Test mode : 802.11a_5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 398.76	PK	V	41.00	7.80	-	48.80	68.20	19.40
10 402.50	PK	H	45.00	7.80	-	52.80	68.20	15.40

Test mode : 802.11a_5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 472.41	PK	V	38.90	8.00	-	46.90	68.20	21.30
10 474.99	PK	H	42.00	8.00	-	50.00	68.20	18.20

Test mode : 802.11a_5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 513.81	PK	H	42.80	8.00	-	50.80	68.20	17.40
10 526.28	PK	V	41.10	8.00	-	49.10	68.20	19.10

Test mode : 802.11a_5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 557.53	PK	H	43.30	8.10	-	51.40	68.20	16.80
10 563.72	PK	V	38.70	8.10	-	46.80	68.20	21.40

Test mode : 802.11a_5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 351.53	PK	H	60.00	-2.30	-	57.70	74.00	16.30
	AV	H	44.30	-2.30	-	42.00	54.00	12.00
5 352.58	PK	V	62.20	-2.30	-	59.90	74.00	14.10
	AV	V	47.10	-2.30	-	44.80	54.00	9.20
10 638.77	PK	H	41.20	8.30	-	49.50	74.00	24.50

Test mode : 802.11a_5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 446.94	PK	H	50.70	-2.00	-	48.70	74.00	25.30
5 452.59	PK	V	57.50	-1.90	-	55.60	74.00	18.40
	AV	V	39.20	-1.90	-	37.30	54.00	16.70
5 468.61	PK	H	61.30	-1.80	-	59.50	68.20	8.70
5 470.02	PK	V	64.70	-1.80	-	62.90	68.20	5.30
11 001.14	PK	H	40.60	8.80	-	49.40	74.00	24.60
11 004.94	PK	V	40.00	8.80	-	48.80	74.00	25.20

Test mode : 802.11a_5580 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 152.60	PK	V	37.80	8.90	-	46.70	74.00	27.30
11 159.97	PK	H	39.20	8.90	-	48.10	74.00	25.90

Test mode : 802.11a_5720 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 437.52	PK	V	39.50	9.20	-	48.70	74.00	25.30
11 441.27	PK	H	42.50	9.20	-	51.70	74.00	22.30

Test mode : 802.11a 5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 645.77	PK	V	49.10	-1.30	-	47.80	68.20	20.40
5 647.09	PK	H	47.80	-1.30	-	46.50	68.20	21.70
5 717.28	PK	V	63.40	-1.20	-	62.20	110.10	47.90
5 718.49	PK	H	54.90	-1.20	-	53.70	110.40	56.70
5 723.93	PK	H	64.10	-1.20	-	62.90	119.80	56.90
5 724.32	PK	V	78.60	-1.20	-	77.40	120.70	43.30
11 490.11	PK	H	41.00	9.20	-	50.20	74.00	23.80
11 492.51	PK	V	39.80	9.20	-	49.00	74.00	25.00

Test mode : 802.11a 5785 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 566.32	PK	H	42.80	9.50	-	52.30	74.00	21.70
11 571.38	PK	V	39.90	9.50	-	49.40	74.00	24.60

Test mode : 802.11a 5825 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 850.12	PK	H	54.10	-0.90	-	53.20	122.00	68.80
5 850.30	PK	V	63.50	-0.90	-	62.60	121.60	59.00
5 857.44	PK	H	51.20	-0.90	-	50.30	110.10	59.80
5 860.78	PK	V	59.10	-0.90	-	58.20	109.20	51.00
5 929.22	PK	H	47.30	-0.80	-	46.50	68.20	21.70
5 938.51	PK	V	48.00	-0.80	-	47.20	68.20	21.00
11 641.16	PK	H	42.20	9.50	-	51.70	74.00	22.30
11 648.73	PK	V	41.30	9.50	-	50.80	74.00	23.20

Test mode : 802.11n(HT20) 5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 145.34	PK	V	59.60	-2.90	-	56.70	74.00	17.30
	AV	V	45.00	-2.90	-	42.10	54.00	11.90
5 149.73	PK	H	56.30	-2.90	-	53.40	74.00	20.60
10 353.81	PK	V	41.60	7.80	-	49.40	68.20	18.80
10 362.51	PK	H	43.10	7.80	-	50.90	68.20	17.30

Test mode : 802.11n(HT20) 5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 395.05	PK	H	43.70	7.80	-	51.50	68.20	16.70
10 402.51	PK	V	41.00	7.80	-	48.80	68.20	19.40

Test mode : 802.11n(HT20) 5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 473.39	PK	V	41.20	8.00	-	49.20	68.20	19.00
10 475.04	PK	H	42.90	8.00	-	50.90	68.20	17.30

Test mode : 802.11n(HT20) 5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 520.03	PK	H	43.40	8.00	-	51.40	68.20	16.80
10 521.19	PK	V	39.60	8.00	-	47.60	68.20	20.60

Test mode : 802.11n(HT20) 5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 555.09	PK	V	39.20	8.10	-	47.30	68.20	20.90
10 567.52	PK	H	42.00	8.10	-	50.10	68.20	18.10

Test mode : 802.11n(HT20) 5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 351.00	PK	V	63.50	-2.30	-	61.20	74.00	12.80
	AV	V	48.60	-2.30	-	46.30	54.00	7.70
5 353.46	PK	H	61.40	-2.30	-	59.10	74.00	14.90
	AV	H	43.70	-2.30	-	41.40	54.00	12.60
10 632.52	PK	V	37.90	8.30	-	46.20	74.00	27.80
10 636.25	PK	H	39.80	8.30	-	48.10	74.00	25.90

Test mode : 802.11n(HT20) 5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 456.97	PK	V	61.00	-1.90	-	59.10	74.00	14.90
	AV	V	43.40	-1.90	-	41.50	54.00	12.50
5 459.96	PK	H	53.00	-1.80	-	51.20	74.00	22.80
5 469.33	PK	H	63.40	-1.80	-	61.60	68.20	6.60
5 469.48	PK	V	67.30	-1.80	-	65.50	68.20	2.70
10 993.77	PK	H	40.40	8.70	-	49.10	74.00	24.90
11 007.51	PK	V	38.80	8.80	-	47.60	74.00	26.40

Test mode : 802.11n(HT20) 5580 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 155.03	PK	H	39.90	8.90	-	48.80	74.00	25.20
11 159.99	PK	V	39.80	8.90	-	48.70	74.00	25.30

Test mode : 802.11n(HT20) 5720 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 433.77	PK	V	40.50	9.20	-	49.70	74.00	24.30
11 443.73	PK	H	41.90	9.20	-	51.10	74.00	22.90

Test mode : 802.11n(HT20) 5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 642.43	PK	V	48.10	-1.30	-	46.80	68.20	21.40
5 649.70	PK	H	47.80	-1.30	-	46.50	68.20	21.70
5 719.61	PK	H	57.00	-1.20	-	55.80	110.70	54.90
5 719.89	PK	V	69.10	-1.20	-	67.90	110.80	42.90
5 724.16	PK	H	66.40	-1.20	-	65.20	120.30	55.10
5 724.91	PK	V	79.20	-1.20	-	78.00	122.00	44.00
11 487.40	PK	V	39.90	9.20	-	49.10	74.00	24.90
11 492.46	PK	H	42.90	9.20	-	52.10	74.00	21.90

Test mode : 802.11n(HT20) 5785 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 567.55	PK	H	40.20	9.50	-	49.70	74.00	24.30
11 572.48	PK	V	41.00	9.50	-	50.50	74.00	23.50

Test mode : 802.11n(HT20) 5825 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 850.14	PK	H	58.00	-0.90	-	57.10	121.90	64.80
5 850.15	PK	V	72.60	-0.90	-	71.70	121.90	50.20
5 856.59	PK	V	58.50	-0.90	-	57.60	110.40	52.80
5 856.63	PK	H	51.40	-0.90	-	50.50	110.40	59.90
5 937.16	PK	H	47.60	-0.80	-	46.80	68.20	21.40
5 942.01	PK	V	47.70	-0.80	-	46.90	68.20	21.30
11 647.47	PK	H	41.60	9.50	-	51.10	74.00	22.90
11 648.78	PK	V	40.60	9.50	-	50.10	74.00	23.90

Test mode : 802.11ac(VHT20) 5180 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 146.93	PK	V	63.90	-2.90	-	61.00	74.00	13.00
	AV	V	47.60	-2.90	-	44.70	54.00	9.30
5 147.91	PK	H	53.40	-2.90	-	50.50	74.00	23.50
10 355.00	PK	H	43.40	7.80	-	51.20	68.20	17.00
10 355.00	PK	V	41.60	7.80	-	49.40	68.20	18.80

Test mode : 802.11ac(VHT20) 5200 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 394.99	PK	V	42.20	7.80	-	50.00	68.20	18.20
10 399.97	PK	H	43.50	7.80	-	51.30	68.20	16.90

Test mode : 802.11ac(VHT20) 5240 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 476.23	PK	H	42.90	8.00	-	50.90	68.20	17.30
10 481.35	PK	V	39.80	8.00	-	47.80	68.20	20.40

Test mode : 802.11ac(VHT20) 5260 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 512.55	PK	H	43.20	8.00	-	51.20	68.20	17.00
10 519.92	PK	V	40.50	8.00	-	48.50	68.20	19.70

Test mode : 802.11ac(VHT20) 5280 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 557.52	PK	H	42.20	8.10	-	50.30	68.20	17.90
10 560.04	PK	V	39.30	8.10	-	47.40	68.20	20.80

Test mode : 802.11ac(VHT20) 5320 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 350.15	PK	V	63.60	-2.30	-	61.30	74.00	12.70
	AV	V	48.70	-2.30	-	46.40	54.00	7.60
5 350.61	PK	H	61.00	-2.30	-	58.70	74.00	15.30
	AV	H	45.70	-2.30	-	43.40	54.00	10.60
10 641.25	PK	H	40.30	8.30	-	48.60	74.00	25.40

Test mode : 802.11ac(VHT20) 5500 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 456.85	PK	V	61.20	-1.90	-	59.30	74.00	14.70
	AV	V	44.00	-1.90	-	42.10	54.00	11.90
5 459.66	PK	H	52.60	-1.80	-	50.80	74.00	23.20
5 463.06	PK	H	63.70	-1.80	-	61.90	68.20	6.30
5 468.52	PK	V	62.80	-1.80	-	61.00	68.20	7.20
11 000.06	PK	V	38.80	8.80	-	47.60	74.00	26.40
11 002.50	PK	H	40.80	8.80	-	49.60	74.00	24.40

Test mode : 802.11ac(VHT20) 5580 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 156.20	PK	H	39.60	8.90	-	48.50	74.00	25.50
11 156.20	PK	V	38.00	8.90	-	46.90	74.00	27.10

Test mode : 802.11ac(VHT20) 5720 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 432.50	PK	V	40.30	9.20	-	49.50	74.00	24.50
11 435.04	PK	H	41.60	9.20	-	50.80	74.00	23.20

Test mode : 802.11ac(VHT20) 5745 MHz

Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 645.15	PK	H	47.60	-1.30	-	46.30	68.20	21.90
5 649.77	PK	V	49.00	-1.30	-	47.70	68.20	20.50
5 719.84	PK	H	56.80	-1.20	-	55.60	110.80	55.20
5 719.86	PK	V	69.40	-1.20	-	68.20	110.80	42.60
5 723.60	PK	V	80.50	-1.20	-	79.30	119.00	39.70
5 724.82	PK	H	64.60	-1.20	-	63.40	121.80	58.40
11 498.74	PK	H	42.00	9.20	-	51.20	74.00	22.80
11 490.16	PK	V	40.20	9.20	-	49.40	74.00	24.60

Test mode : 802.11ac(VHT20) 5785 MHz

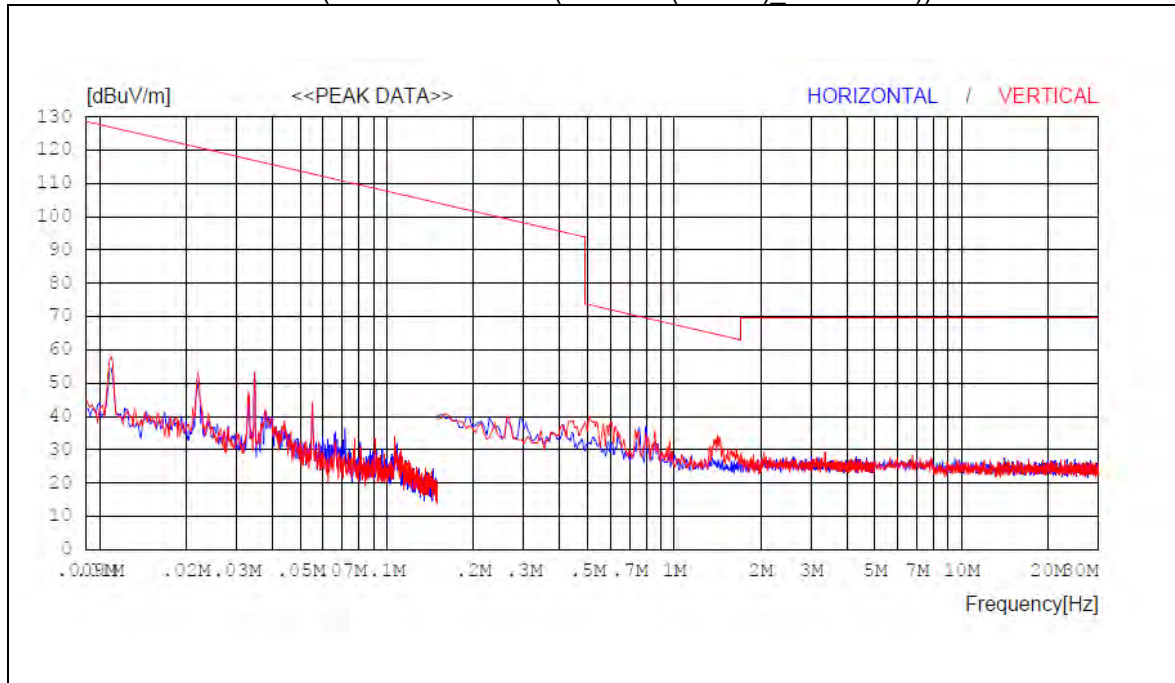
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11 566.33	PK	V	39.00	9.50	-	48.50	74.00	25.50
11 568.75	PK	H	40.60	9.50	-	50.10	74.00	23.90

Test mode : 802.11ac(VHT20) 5825 MHz

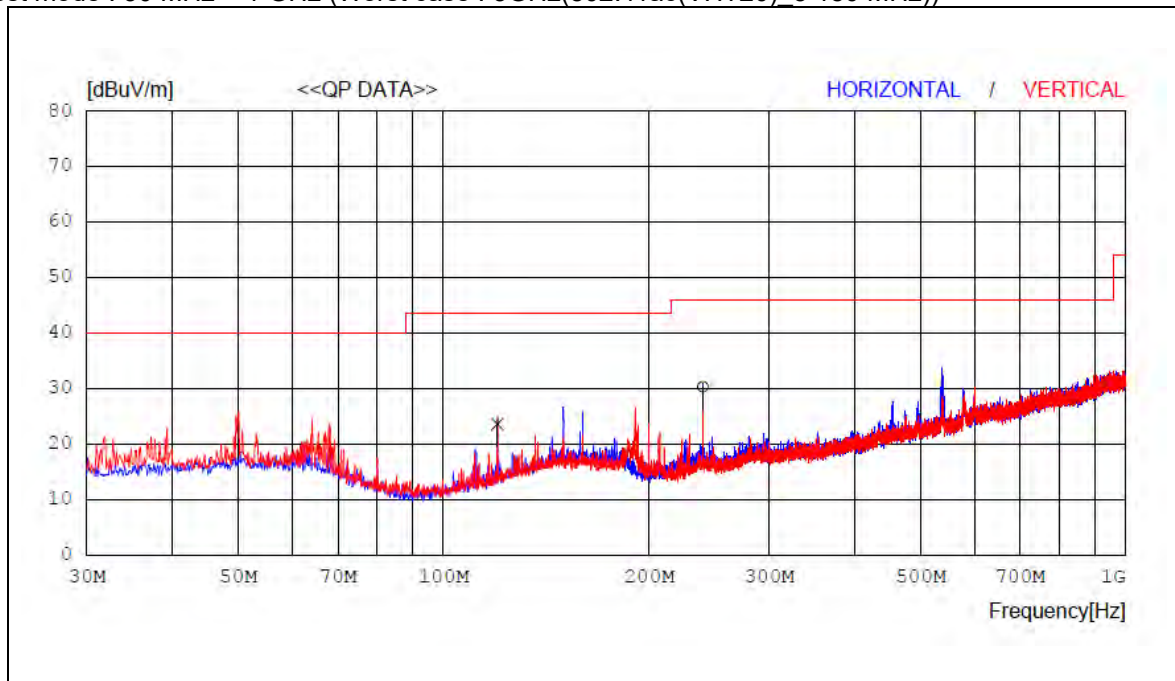
Frequency (MHz)	Detector	Pol. (V/H)	Reading (dBμV)	Factor (dB)	Dutycycle Factor (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 850.20	PK	H	56.90	-0.90	-	56.00	121.80	65.80
5 850.22	PK	V	71.80	-0.90	-	70.90	121.70	50.80
5 856.26	PK	V	59.20	-0.90	-	58.30	110.50	52.20
5 856.34	PK	H	50.90	-0.90	-	50.00	110.50	60.50
5 933.09	PK	V	48.90	-0.80	-	48.10	68.20	20.10
5 943.79	PK	H	47.30	-0.80	-	46.50	68.20	21.70
11 653.68	PK	H	42.10	9.50	-	51.60	74.00	22.40
11 653.68	PK	V	40.50	9.50	-	50.00	74.00	24.00

4.3.6.6 Measurement Plot

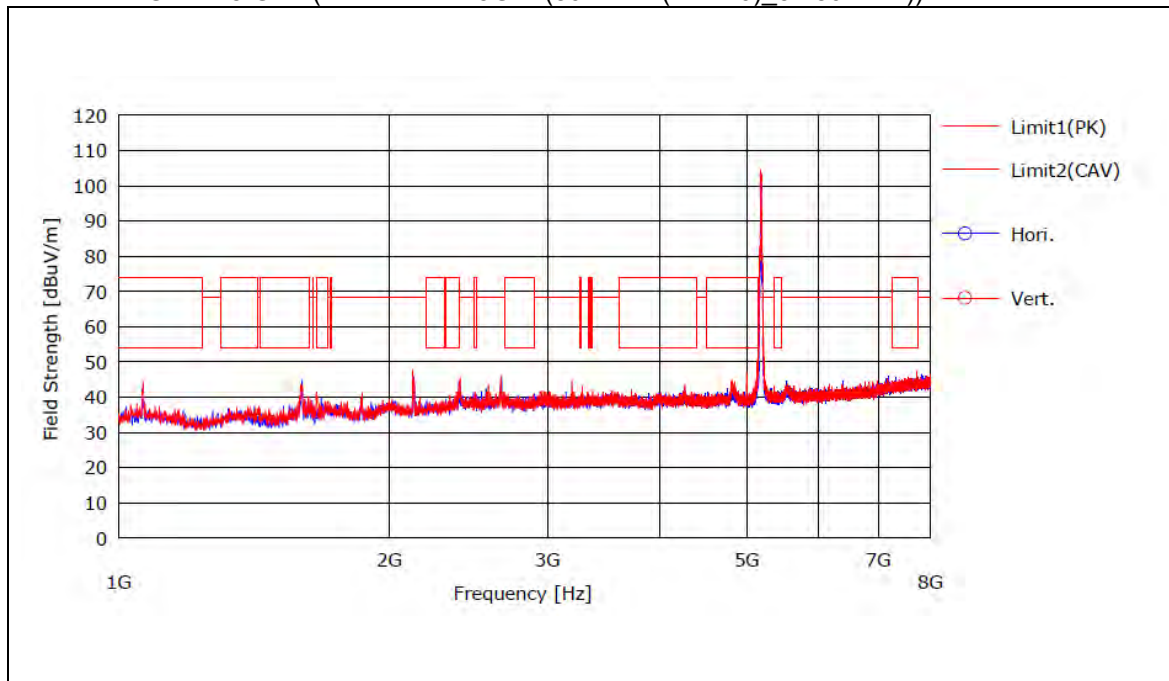
Test mode : 9 kHz ~ 30 MHz (Worst case : 5GHz(802.11ac(VHT20) 5 180 MHz))



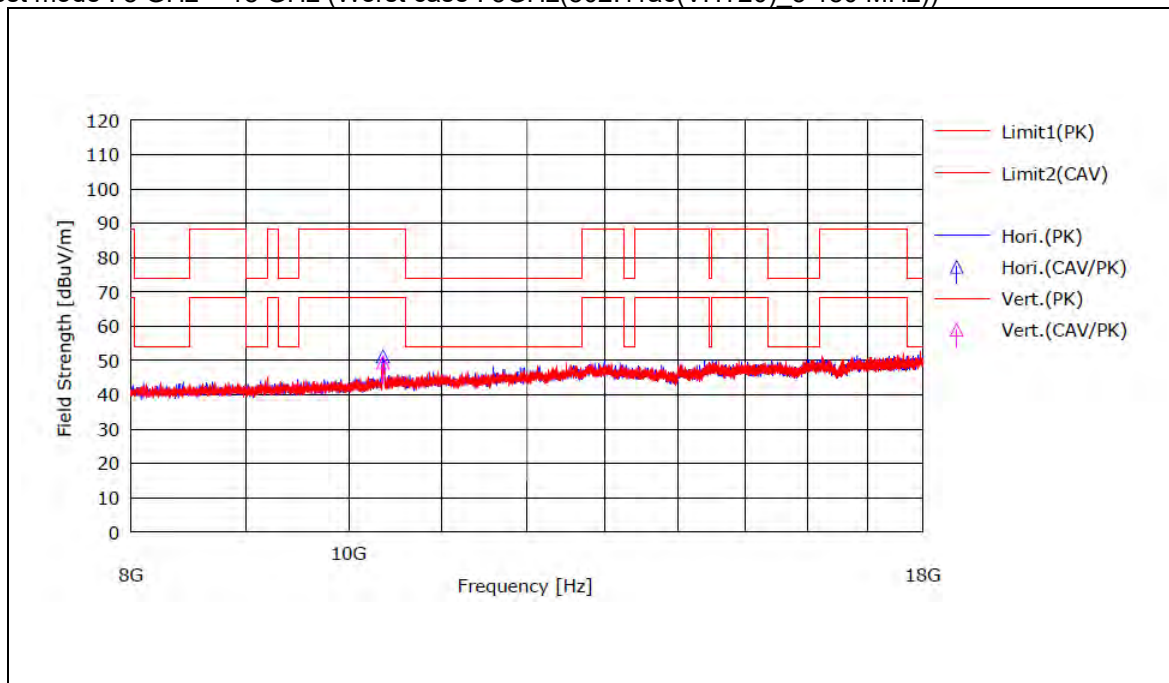
Test mode : 30 MHz ~ 1 GHz (Worst case : 5GHz(802.11ac(VHT20) 5 180 MHz))



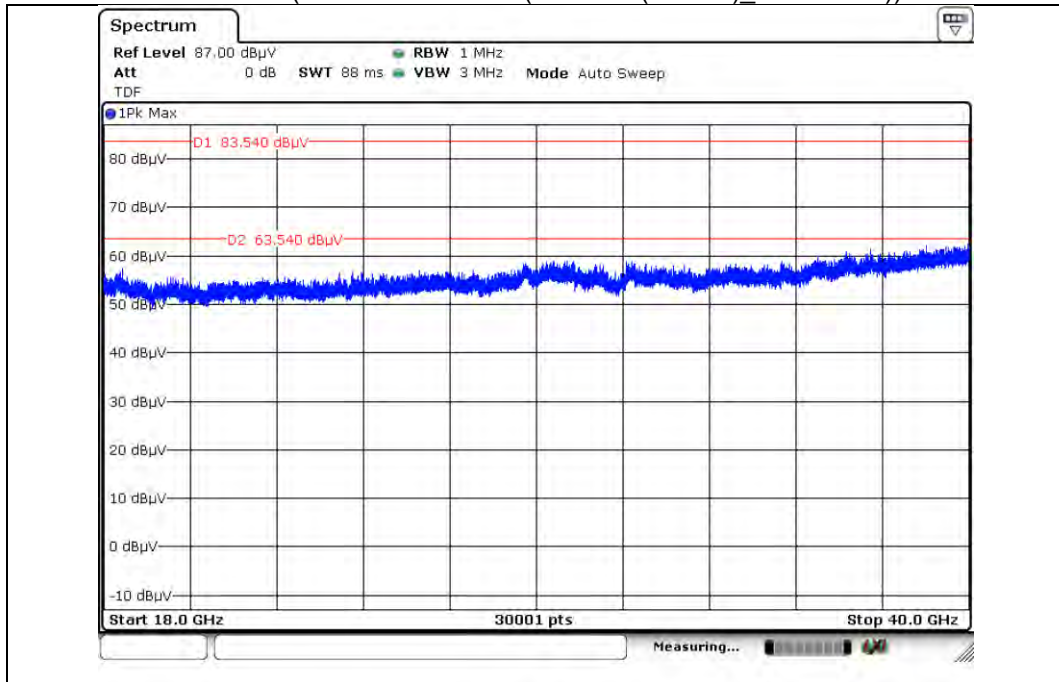
Test mode : 1 GHz ~ 8 GHz (Worst case : 5GHz(802.11ac(VHT20)_5 180 MHz))



Test mode : 8 GHz ~ 18 GHz (Worst case : 5GHz(802.11ac(VHT20)_5 180 MHz))

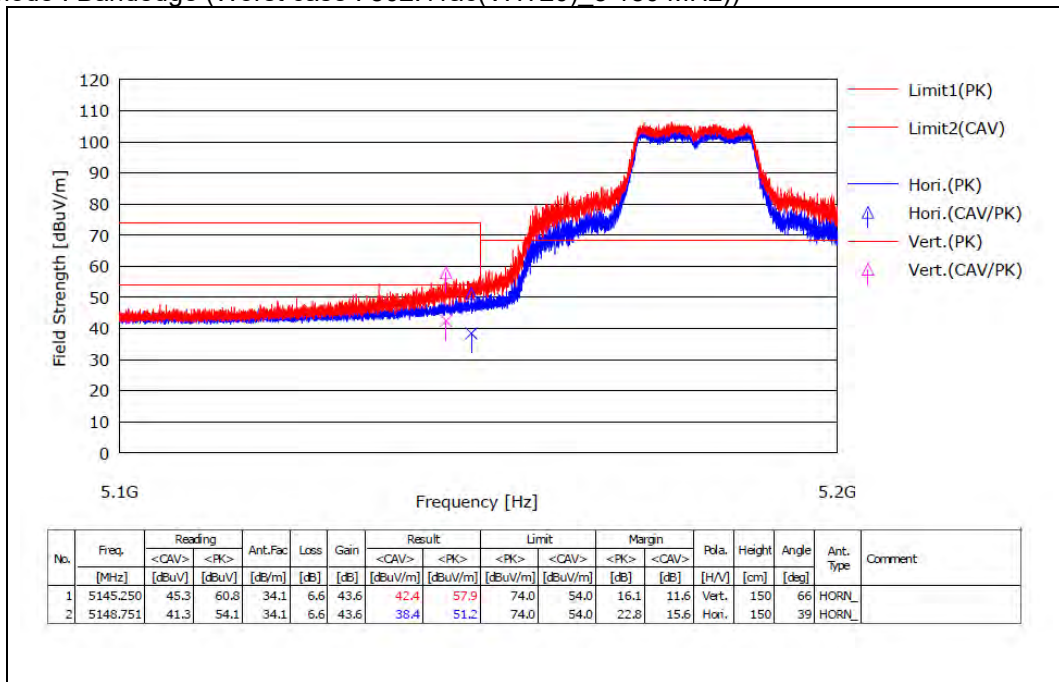


Test mode : 18 GHz ~ 40 GHz (Worst case : 5GHz(802.11ac(VHT20)_5 180 MHz))



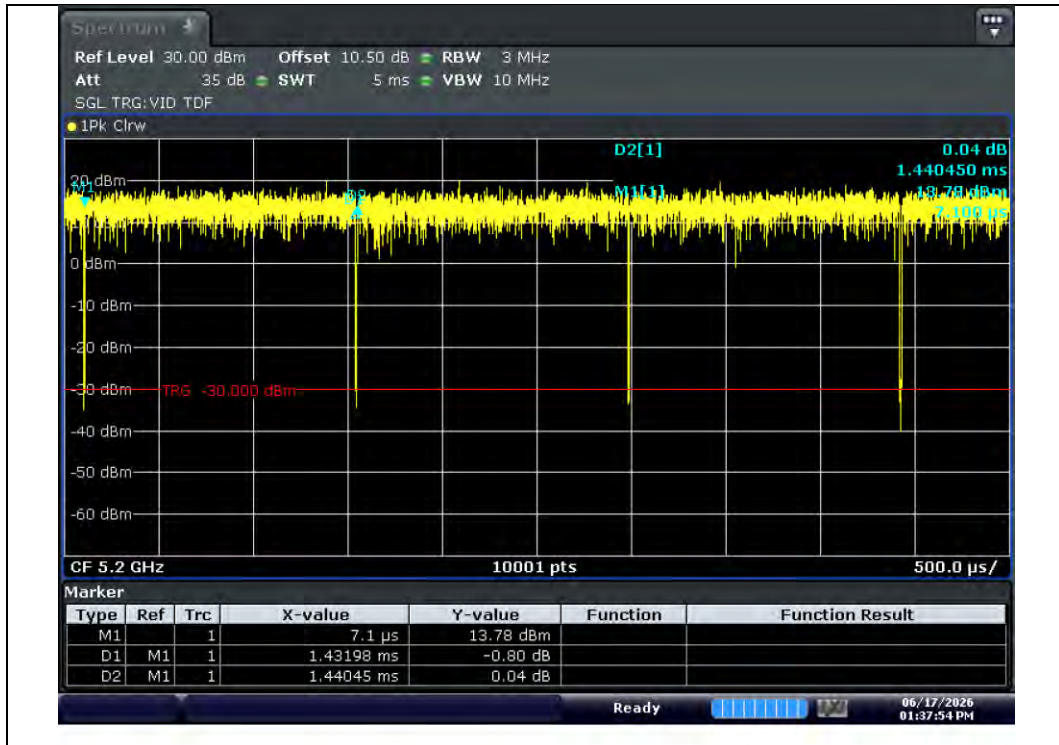
Note 1 : Limit : Peak : 83.54 dBμV/m, Average : 63.54 dBμV/m

Test mode : Bandedge (Worst case : 802.11ac(VHT20)_5 180 MHz))



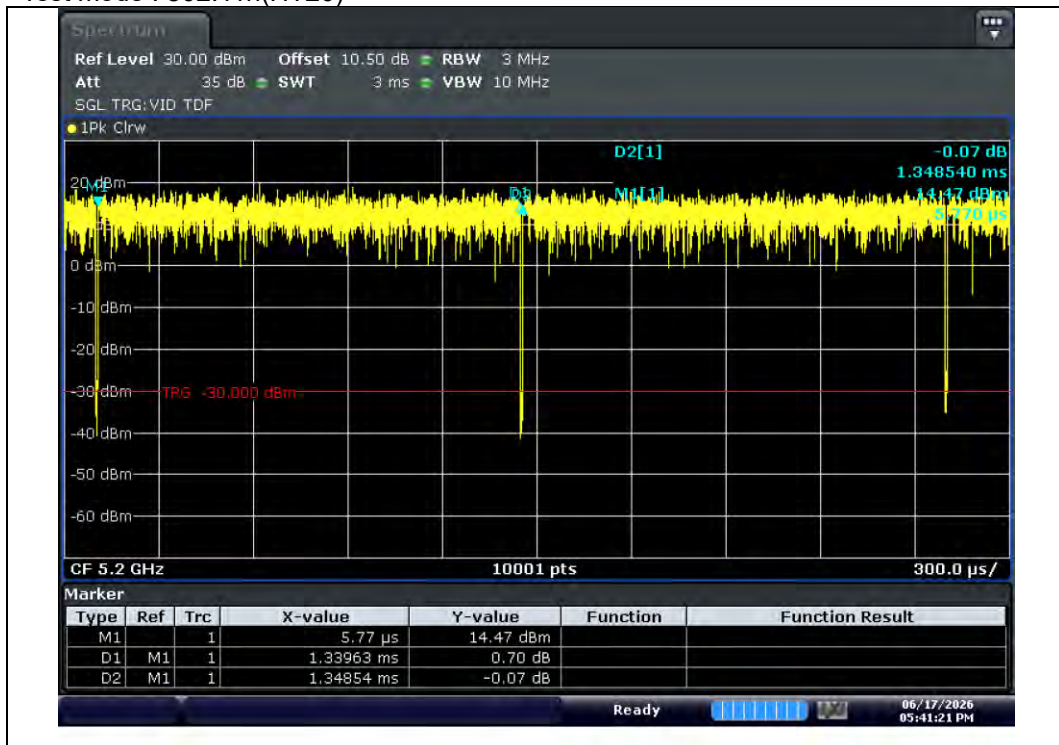
4.3.6.7 Measurement Plot_Dutycycle

Test mode : 802.11a



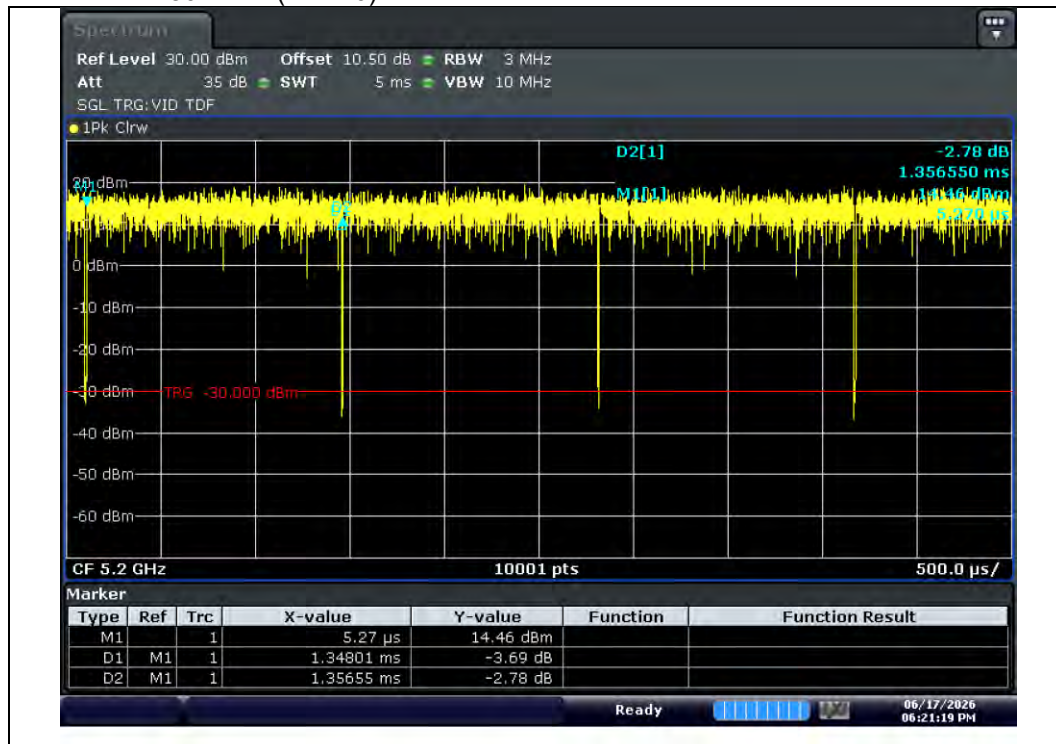
*Duty cycle : $\geq 98\%$

Test mode : 802.11n(HT20)



*Duty cycle : $\geq 98\%$

Test mode : 802.11ac(VHT20)



*Duty cycle : ≥ 98%

4.3.7 Conducted Emission

4.3.7.1 Regulation

According to §15.207(a), and RSS-GEN 8.8 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 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/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 (MHz)	Conducted limit (dB μ V)	
	Quasi-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.

4.3.7.2 Measurement Procedure

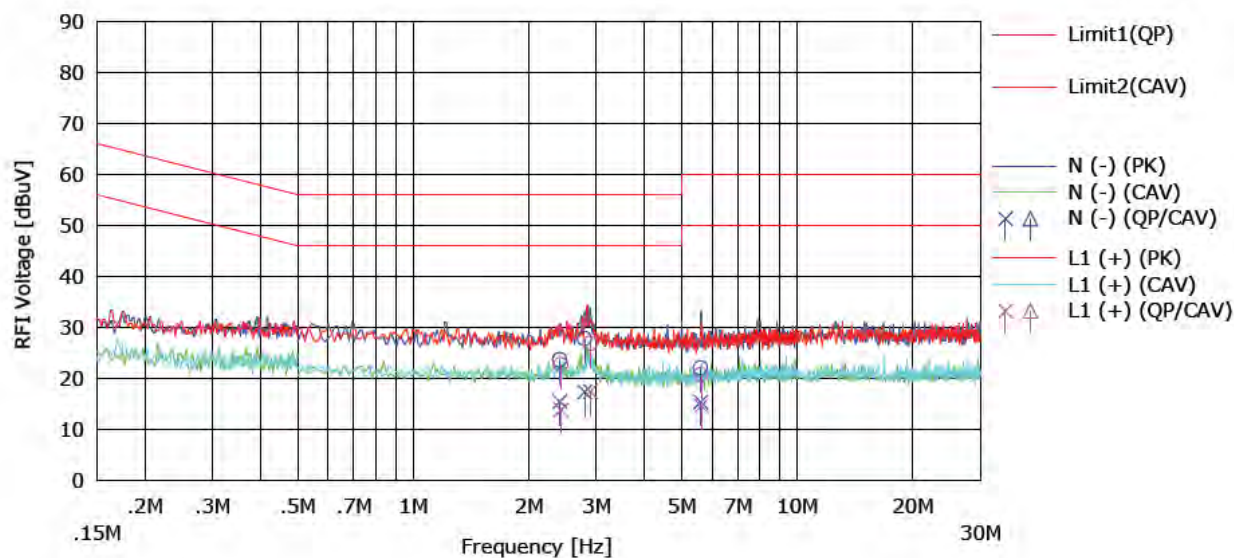
- 1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5 m away from the side wall of the shielded room.
- 2) Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω /50 μ H LISN, 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 MHz to 30 MHz.
- 5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASIPeak and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

4.3.7.3 Result

Comply (measurement data : refer to the next page)

4.3.7.4 Measurement data

Test mode : 802.11ac(VHT20)_5 180 MHz



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	CAV [dBuV]		QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	
1	2.40699	3.8	-4.4	19.9	23.6	15.4	56.0	46.0	32.4	30.6	N (-)
2	2.79262	7.9	-2.5	19.9	27.8	17.4	56.0	46.0	28.2	28.6	N (-)
3	5.60555	2.0	-4.7	20.0	22.0	15.4	60.0	50.0	38.0	34.6	N (-)
4	2.42250	2.8	-6.1	19.9	22.7	13.8	56.0	46.0	33.3	32.2	L1 (+)
5	2.88738	6.9	-2.4	19.9	26.8	17.5	56.0	46.0	29.2	28.5	L1 (+)
6	5.62151	0.7	-5.4	20.0	20.7	14.6	60.0	50.0	39.3	35.4	L1 (+)

4.3.8 Dynamic Frequency Selection (DFS).

4.3.8.1 Regulation

According to §15.407(h) and RSS-247 6.3 Dynamic Frequency Selection (DFS).

(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz 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 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi 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.

(1) Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the U-NII bands, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use means including, but not limited to the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment authorization.

(2) Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the U-NII device.

TECHNICAL REQUIREMENTS FOR DFS IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS

Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

DFS Detection Thresholds

below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Response Requirements

provides the response requirements for Master and Client Devices incorporating DFS

DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds 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 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A	$\text{Roundup} \left\{ \left(\frac{1}{360} \right), \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μ sec is selected, the number of pulses would be $\text{Roundup}\left\{\left(\frac{1}{360}\right) \cdot \left(\frac{19 \cdot 10^6}{3066}\right)\right\} = \text{Round up } \{17.2\} = 18$.

Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4.

Long Pulse Radar Test Waveform

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Frequency Hopping Radar Test Waveform

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	30	70%	30

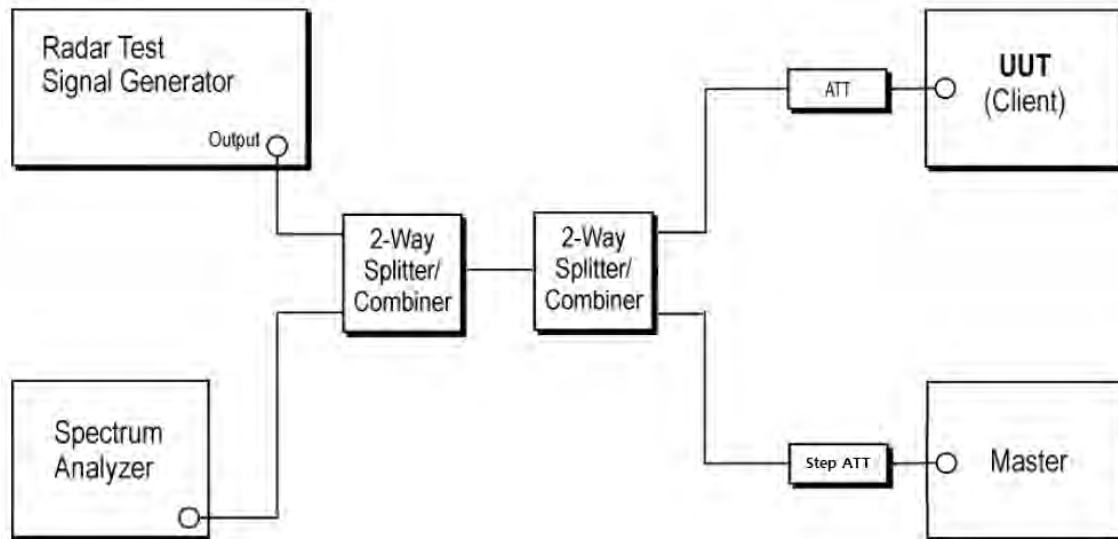
For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

4.3.8.2 Client Devices requirement

- a) A Client Device will not transmit before having received appropriate control signals from a Master Device.
- b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.
- c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.
- d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.
- e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

4.3.8.3 Conduct test setup



4.3.8.4 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

4.4.8.4.1 Measurement Procedure

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device (In- Service Monitoring).

- a) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.
- b) In case the UUT is a U-NII device operating as a Client Device (with or without DFS), a U-NII device operating as a Master Device will be used to allow the UUT (Client device) to Associate with the Master Device. In case the UUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will Associate with the UUT (Master). In both cases for conducted tests, the Radar Waveform generator will be connected to the Master Device. For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
- c) Stream the channel loading test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
- d) At time T_0 the Radar Waveform generator sends a Burst of pulses for one of the Radar Type 0 in Table 5 at levels defined in Table 3, on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- e) Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Measure and record the Channel Move Time and Channel Closing Transmission Time if radar detection occurs. Figure 17 illustrates Channel Closing Transmission Time.
- f) When operating as a Master Device, monitor the UUT for more than 30 minutes following instant T_2 to verify that the UUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.
- g) In case the UUT is a U-NII device operating as a Client Device with In-Service Monitoring, perform steps a) to f).

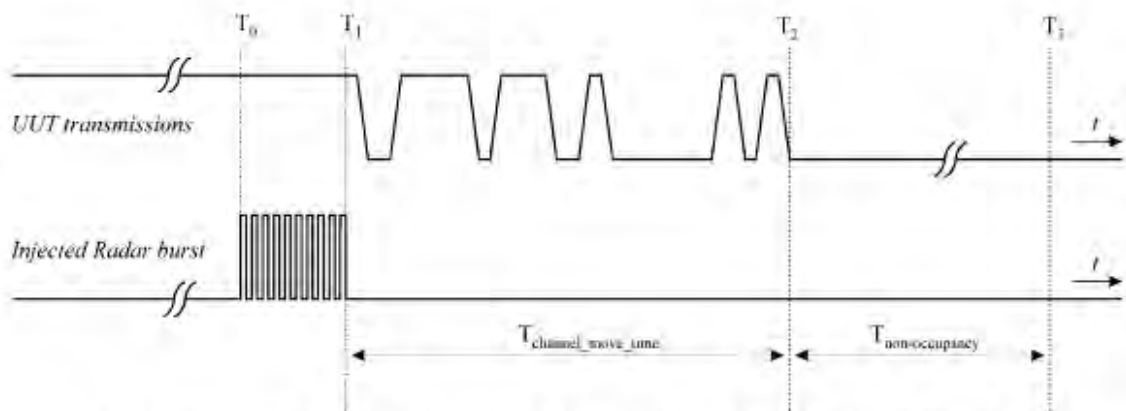


Figure 17: Example of Channel Closing Transmission Time & Channel Closing Time

4.3.8.4.2 Result

Comply

(This device is Client Device without radar detection)

4.3.8.4.3 Measurement data

Client Device without radar detection

Channel Move Time			
Bandwidth (MHz)	Frequency (MHz)	Channel Move Time (s)	Limit (s)
20	5 300	1.15	10.00
	5 500	1.07	10.00

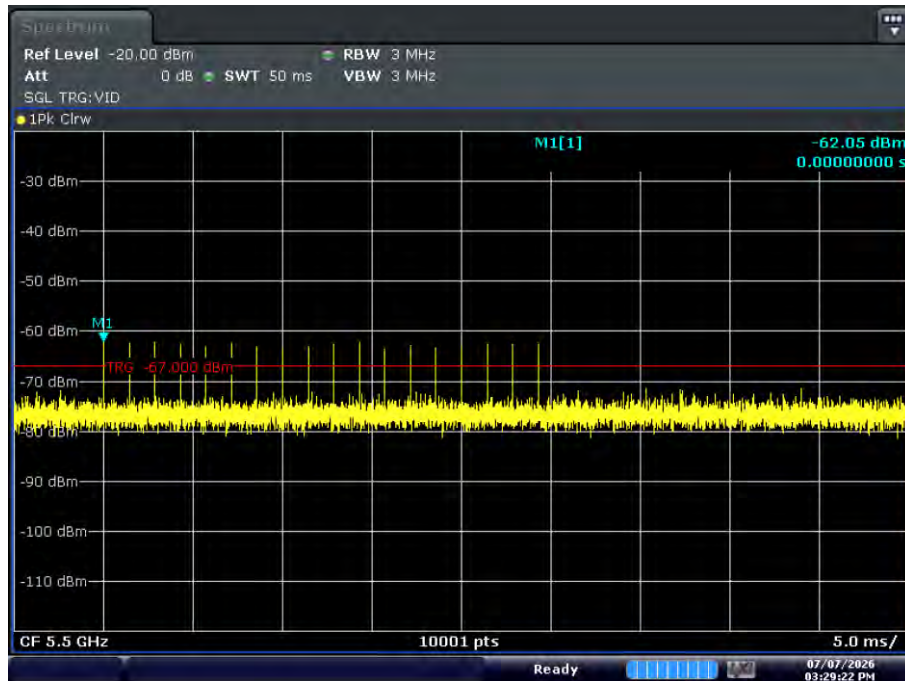
Channel Closing Transmission Time			
Bandwidth (MHz)	Frequency (MHz)	Channel Closing Transmission Time (ms)	Limit (ms)
20	5 300	26.00	60.00
	5 500	24.00	60.00

Note : In case of Channel Close Transmission Time, ASC II trace data was exported to Excel and calculated.

Non-Occupancy Period			
Bandwidth (MHz)	Frequency (MHz)	Non-Occupancy Period (min)	Limit (min)
20	5 300	> 30	30
	5 500	> 30	30

4.3.8.4.4 Test Plot_DFS Detection Threshold

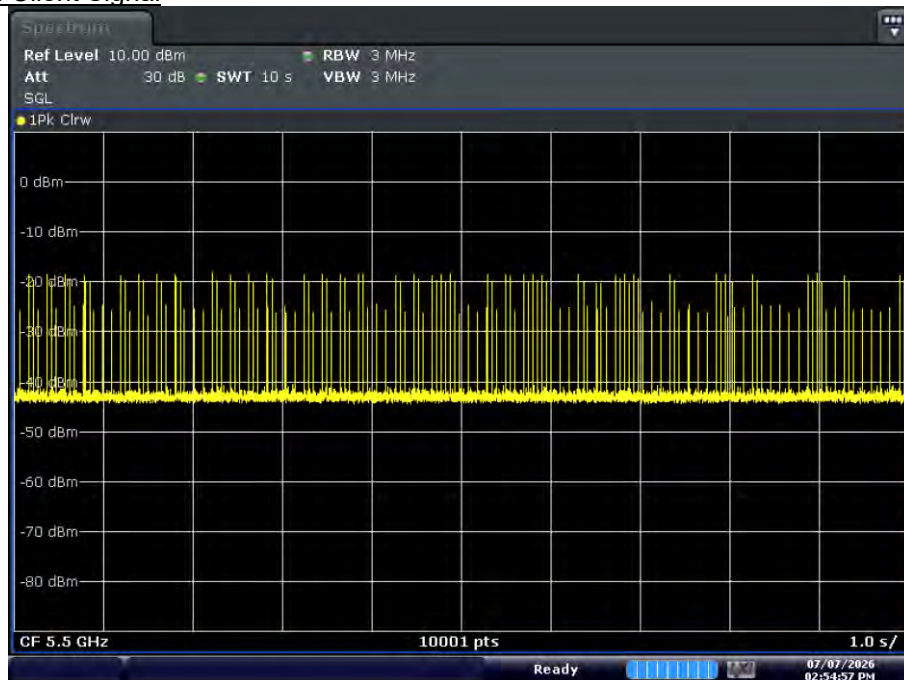
Radar Signal 0



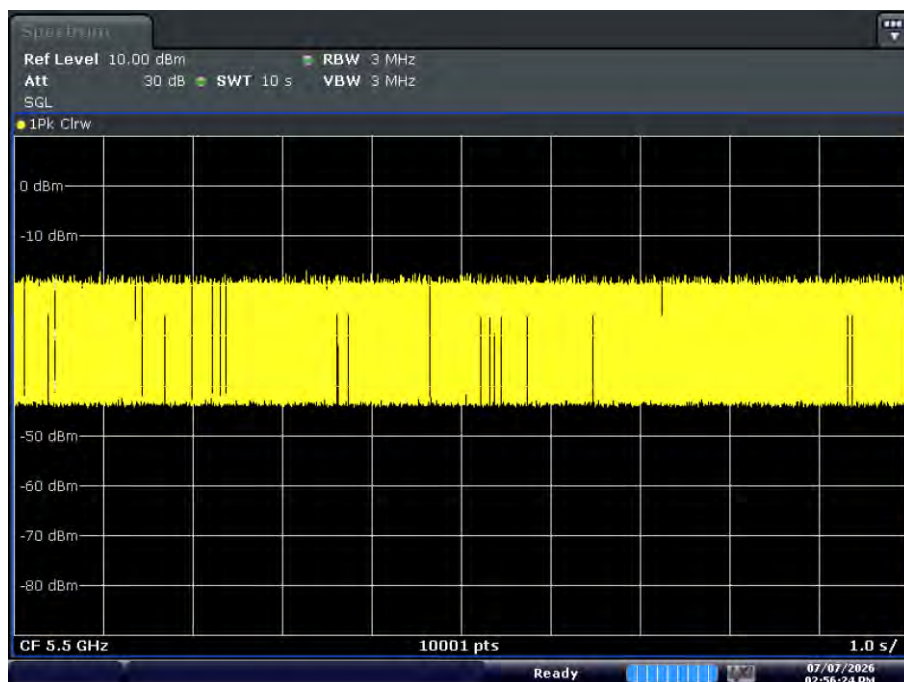
Note : The Interference Radar Detection Threshold Level is -64.00 dBm.
The tested level is lower than required level hence it provides margin to the limit.

4.3.8.4.5 Test Plot_Test Channel Loading

Test mode : Client Signal

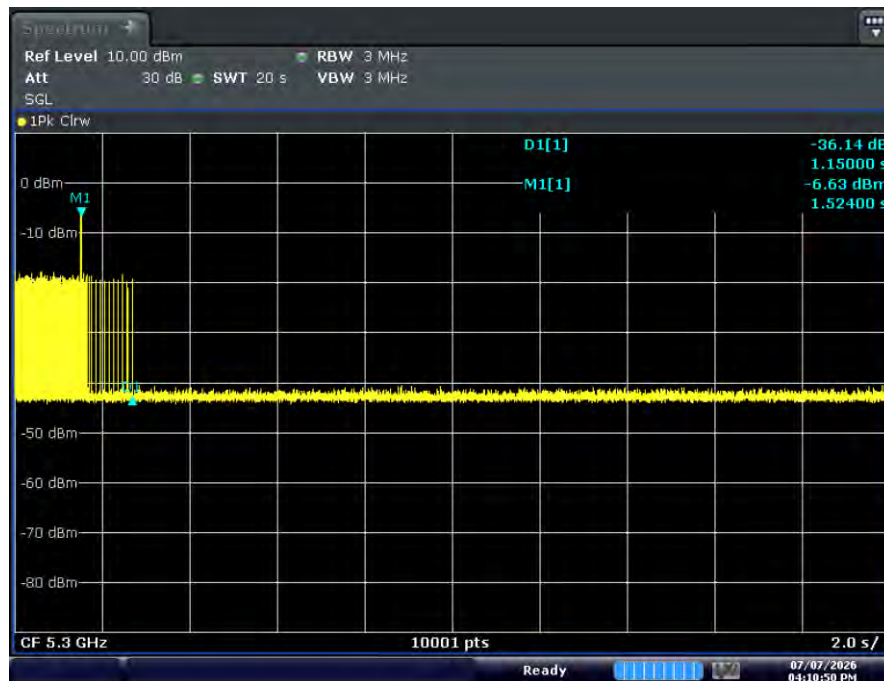


Test mode : Traffic Signal

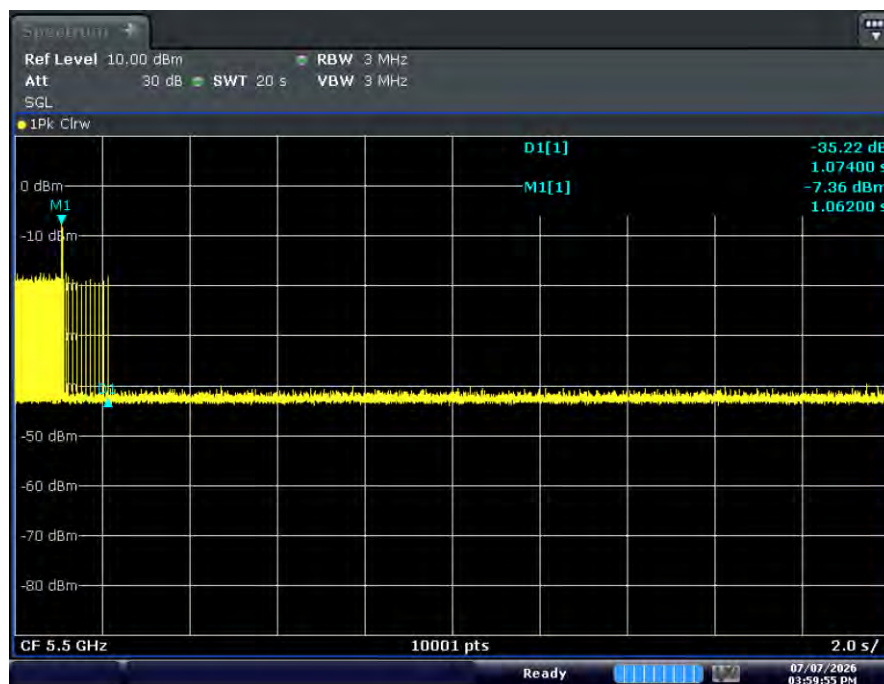


4.3.8.4.6 Test Plot_Channel move time

Test mode : 20 MHz BW_5 300 MHz

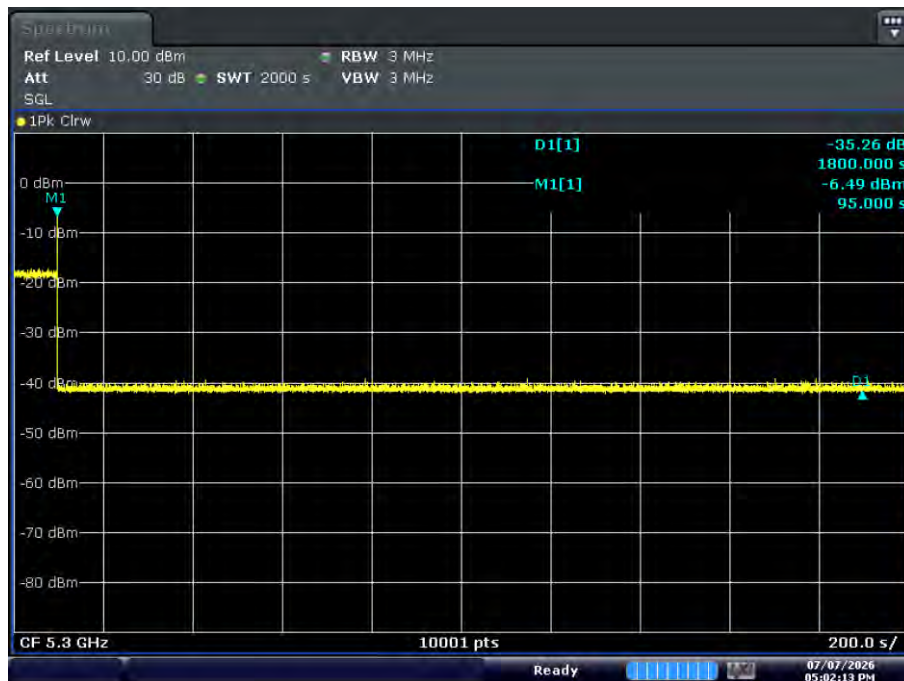


Test mode : 20 MHz BW_5 500 MHz

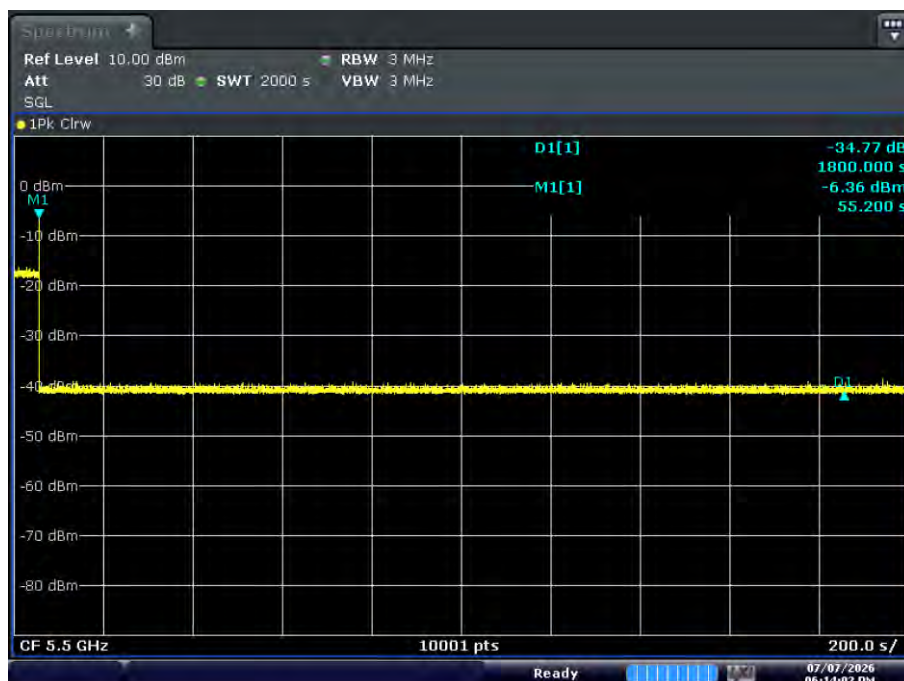


4.3.8.4.7 Test Plot_Non-Occupancy Period

Test mode : 20 MHz BW 5 300 MHz



Test mode : 20 MHz BW 5 500 MHz



APPENDIX I

TEST EQUIPMENT USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

Equipment	Manufacturer	Model	Serial No.	Cal. Date (yy.mm.dd)	Next Cal.Date (yy.mm.dd)
FSV Signal Analyzer	ROHDE&SCHWARZ	FSV30	103370	2025-10-01	2026-10-01
FSV Signal Analyzer	ROHDE&SCHWARZ	FSV40	101010	2026-04-01	2027-04-01
ATTENUATOR	WEINSCHTEL	54A-10	69681	2025-09-30	2026-09-30
Digital MultiMeter	HP	34401A	US36025428	2025-12-23	2026-12-23
Humidity & Temp. chamber	SJ SCIENCE	SJ-TH-S50	170719	2026-04-01	2027-04-01
Power Sensor	KEYSIGHT	U2022XA	MY55320008	2025-08-07	2026-08-07
AC Power Supply	KIKUSUI	PCR 500L	FE002647	2026-04-02	2027-04-02
Signal Generator	ROHDE&SCHWARZ	SMB100A	178384	2025-10-01	2026-10-01
POWER DIVIDER	WEINSCHTEL	1580-1	SQ747	2026-03-16	2027-03-16
POWER DIVIDER	WEINSCHTEL	1580-1	SQ748	2026-03-16	2027-03-16
ATTENUATOR	INMET	26A-30	TR013	2025-10-01	2026-10-01
TERMINATION	Agilent	909D	51640	2025-08-07	2026-08-07
Vector Signal Generator	ROHDE&SCHWARZ	SMM100A	101603	2025-10-01	2026-10-01
STEP ATTENUATOR	Agilent	8494B	MY42145885	2026-04-01	2027-04-01
STEP ATTENUATOR	Agilent	8495B	MY42143360	2026-04-01	2027-04-01
High pass filter	Wainwright Instruments GmbH	WHNX6-5840-8000-26500-60CC	4	2025-12-23	2026-12-23
RF Cable	Radiall	1800920922000KE	CON-R006	2026-07-20	2027-01-20
EMI Test Receiver	ROHDE&SCHWARZ	ESU40	100445	2025-09-01	2026-09-01
BiLog Antenna	Schwarzbeck	VULB9168	00821	2025-03-05	2027-03-05
ATTENUATOR	JFW	50F-006	6 dB-3	2025-12-22	2026-12-22
Antenna Mast	Innco	MA4640-XPET-0800	578	-	-
Antenna Mast	TOKIN	5977	-	-	-
Controller	TOKIN	5909L	141909L-1	-	-
Controller	Innco	CO3000	40040217	-	-
Turn Table	TOKIN	5983-1.5	-	-	-
LOOP ANTENNA	Schwarzbeck	FMZB1519-60D	00239	2026-05-20	2028-05-20
Double Ridge Horn Antenna	ETS	3117	00168719	2026-05-21	2027-05-21
Double Ridge Horn Antenna	A.H Systems, Inc	SAS-574	465	2026-04-03	2028-04-03
Low Noise Preamplifier	TSJ	MLA-10k01-b01-27	1870367	2026-03-25	2027-03-25

Low Noise amplifier	TESTEK	TK-PA18H	170004-L	2026-03-26	2027-03-26
PREAMPLIFIER	A.H Systems, Inc	PAM-1840VH	166	2025-12-23	2026-12-23
EMI Test Receiver	ROHDE&SCHWARZ	ESR7	101440	2025-09-01	2026-09-01
LISN	ROHDE&SCHWARZ	ENV216	101883	2026-03-25	2027-03-25
Pulse Limiter	Schwarzbeck	VTSD 9561-F	00189	2026-03-26	2027-03-26

-End-