



TEST REPORT

KCTL Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR24-SRF0007-B Page (1) of (121)	
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1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2023-07-31

2. Use of Report : Certification

3. Name of Product / Model : Wi-Fi/BLE combo module / CCAT710R

4. Manufacturer / Country of Origin : Samsung Electronics Co., Ltd. / Korea

5. FCC ID : A3LCCAT710R

6. IC Certificate No. : 649E-CCAT710R

7. Date of Test : 2023-10-23 to 2023-12-10

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

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

RSS-247 Issue 3 August 2023

RSS-Gen Issue 5 February 2021

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

This laboratory is not accredited for the test results marked. *

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

The above testing certificate is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2024-02-05

Accredited by KOLAS, Republic of KOREA

Eurofins KCTL Co.,Ltd.

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REPORT REVISION HISTORY

Date	Revision	Page No
2024-01-23	Originally issued	-
2024-01-31	Updated	4, 8
2024-02-05	Updated	53~61

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Note. The report No. KR24-SRF0007-A is superseded by the report No. KR24-SRF0007-B.

General remarks for test reports

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

(may be required by the product standard or client)

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

Procedure number, issue date and title:

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

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

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1. General information

Client : Samsung Electronics Co., Ltd.
 Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
 Manufacturer : Samsung Electronics Co., Ltd.
 Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
 Factory1 : SEONG JI SAIGON CO., LTD.
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 Address : No.27 TONGKANG ROAD, TONGHE TOWN, PINGDU CITY, QINGDAO, CHINA
 Laboratory : Eurofins KCTL Co.,Ltd.
 Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
 Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132
 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
 CAB Identifier: KR0040
 ISED Number: 8035A
 KOLAS No.: KT231

2. Device information

Equipment under test : Wi-Fi/BLE combo module
 Model : CCAT710R
 Frequency range : Bluetooth(BDR/EDR, BLE): 2 402 MHz ~ 2 480 MHz
 802.11 b/g/n/ax_HT20/HE20: 2 412 MHz ~ 2 462 MHz
 UNII-1 : 5 180 MHz ~ 5 240 MHz
 UNII-2A : 5 260 MHz ~ 5 320 MHz
 UNII-2C : 5 500 MHz ~ 5 720 MHz
 UNII-3 : 5 745 MHz ~ 5 825 MHz
 Modulation technique : Bluetooth(BDR/EDR)_GFSK, $\pi/4$ DQPSK, 8DPSK
 Bluetooth(BLE)_GFSK
 WIFI(802.11a/b/g/n HT20/ac VHT20/ax HE20)_DSSS, OFDM, OFDMA
 Number of channels : Bluetooth(BDR/EDR)_79ch
 Bluetooth(BLE)_40ch
 2.4 GHz band : 11 ch (20 MHz)
 UNII-1 : 4 ch (20 MHz)
 UNII-2A : 4 ch (20 MHz)
 UNII-2C : 12 ch (20 MHz)
 UNII-3 : 5 ch (20 MHz)
 Power source : DC 5.0 V, DC 12.0 V
 Antenna type : Chip antenna
 Antenna gain : Bluetooth(BDR/EDR/BLE) : -0.1 dBi
 2.4 GHz band : -0.1 dBi
 UNII-1 : 0.9 dBi
 UNII-2A : 0.2 dBi
 UNII-2C : -0.4 dBi
 UNII-3 : -0.7 dBi
 Software version : v1.0
 Hardware version : v1.0
 Operation temperature : -20 °C ~ 85 °C
 Test device serial No. : Conducted : 700CXACR02000013R
 Radiated : 700CXI9FR02000009R
 Test Software / Version : UI_mptool / 2.0.0.1

2.1. Frequency/channel operations

This device contains the following capabilities:

Bluetooth (BDR/EDR/BLE), WLAN 2.4 GHz_802.11b/g/n(HT20)/ax(HE20),
 WLAN 5 GHz_802.11a/n(HT20)/ac(VHT20)/ax(HE20)

UNII-1		UNII-2A		UNII-2C		UNII-3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
36	5 180	52	5 260	100	5 500	149	5 745
40	5 200	56	5 280	120	5 600	157	5 785
48	5 240	64	5 320	140	5 700	165	5 825
				144	5 720		

Table 2.1.1. 802.11ax(HE20) mode

2.2. Test RU offset for tones in each modes

BW (MHz)	Tones (T)	RU offset	Test RU offset		
			Low	Mid	High
20	26	0 ~ 8	0	4	8
	52	37 ~ 40	37	38	40
	106	53 ~ 54	53	-	54
	242	61 / SU	-	61 / -	-

2.3. Band portion of RU allocation about straddle channels

Mode	Channel	Tone number in RU	RU offset	Portion
HE20	Straddle 5720 MHz	26T	0	UNII-2C
			4	UNII-2C
			8	UNII-3
		52T	37	UNII-2C
			38	UNII-2C
			40	UNII-3
		106T	53	UNII-2C
			54	UNII-2C & UNII-3
		242T / SU	61 / -	UNII-2C & UNII-3

2.4. Duty Cycle Factor

Test mode	Tone	Period (ms)	On time (ms)	Duty cycle		Duty Cycle Factor (dB)
				(Linear)	(%)	
802.11ax HE 20 SISO	26T	4.832	4.825	0.998 7	99.87	0.01
	52T	4.846	4.840	0.998 8	99.88	0.01
	106T	4.846	4.841	0.998 9	99.89	0.00
	242T	4.846	4.841	0.999 0	99.90	0.00
	SU	18.663	18.655	0.999 6	99.96	0.00

1. Duty cycle (Linear) = $T_{on} \text{ time} / \text{Period}$
2. DCF(Duty cycle factor) = $10\log(1/\text{duty cycle})$
3. DCF is not compensated to average result if duty cycle is more than 98%
4. Please refer to Appendix A for plots,

3. Antenna requirement

Requirement of FCC part section 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.

Requirement of RSS-Gen Section 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.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

- The transmitter has permanently attached Chip antenna (Internal antenna) on board.
- The E.U.T Complies with the requirement of §15.203, §15.247, §15.407.

4. Summary of tests

FCC Part section(s)	IC Rule Reference	Parameter	Test Condition	Test results
15.407(a)	RSS-247 Issue 2, 6.2	Maximum conducted output power	Conducted	Pass
15.407(a)	RSS-247 Issue 2, 6.2	Maximum power spectral density		Pass
15.407(a)	RSS-Gen Issue 5, 6.7	26 dB Channel Bandwidth		Pass
15.407(e)	RSS-247 Issue 2, 6.2.4	6 dB Channel Bandwidth		Pass
15.407(g)	RSS-Gen Issue 5, 6.11, 8.11	Frequency stability		Pass
-	RSS-Gen Issue 5, 6.7	Occupied Bandwidth		Pass
15.207(a)	RSS-Gen Issue 5, 8.8	AC Conducted Emissions		Pass
15.407(b), 15.205(a), 15.209(a)	RSS-Gen Issue 5, 8.9, 8.10 RSS-247 Issue 2, 6.2,	Spurious emission Band-edge, restricted band	Radiated	Pass
				Pass

Notes.

- All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- According to exploratory test no any obvious emission were detected from 9 kHz to 30 MHz. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
- EUT was investigated in three orthogonal orientations X, Y and Z. it was determined that **X** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **X** orientation.
- The test procedure(s) in this report were performed in accordance as following.
 - ANSI C63.10-2013
 - KDB 662911 D01 v02r01
 - KDB 789033 D02 v02r01
- Based on the baseline scan, the worst-case data rates were:
802.11ax HE20 mode: MCS0
- For AC Conducted emission and spurious emission below 1 GHz, please refer to 15.407 legacy test report.

5. Measurement uncertainty

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

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

Parameter	Expanded uncertainty ($\pm$)	
Conducted RF power	0.9 dB	
Conducted spurious emissions	1.3 dB	
Occupied Bandwidth	1.0 %	
Power Spectral Density	1.0 dB	
Radiated spurious emissions	9 kHz ~ 30 MHz	2.3 dB
	30 MHz ~ 1 000 MHz	2.5 dB
	Above 1 GHz	4.7 dB
Conducted emissions	9 kHz ~ 150 kHz	4.8 dB
	150 kHz ~ 30 MHz	2.7 dB

6. Measurement results explanation example

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

With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	10.12	9 000	12.03
50	10.27	10 000	12.12
100	10.33	11 000	12.13
200	10.42	12 000	12.36
300	10.51	13 000	12.45
400	10.56	14 000	12.60
500	10.61	15 000	13.01
600	10.66	16 000	12.92
700	10.70	17 000	13.28
800	10.73	18 000	13.16
900	10.75	19 000	13.48
1 000	10.76	20 000	13.39
2 000	10.93	21 000	13.64
3 000	11.12	22 000	13.75
4 000	11.24	23 000	13.87
5 000	11.36	24 000	13.90
6 000	11.56	25 000	14.06
7 000	11.59	26 000	14.25
8 000	11.71	26 500	14.07

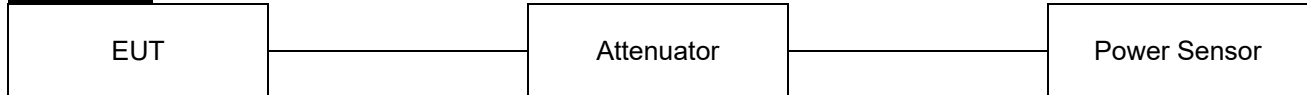
Notes:

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

7. Test results

7.1. Maximum conducted output power

Test setup



Limit

According to §15.407(a), RSS-247(6.2)

FCC

Band	EUT category	Conducted output power limit
UNII-1	Outdoor access point	1 W (30 dBm)
	Indoor access point	
	Fixed point-to-point access point	
	✓ Client device	250 mW (23.98 dBm)
UNII-2A	✓	250 mW or 11 dBm + 10logB ¹⁾
UNII-2C	✓	250 mW or 11 dBm + 10logB ¹⁾
UNII-3	✓	1 W (30 dBm)

IC

Band	Maximum e.i.r.p. limit
UNII-1	200 mW or 10 + 10 logB ²⁾ , dBm
UNII-2A	1 W or 17 dBm + 10logB ²⁾
UNII-2C	1 W or 17 dBm + 10logB ²⁾
UNII-3	1 W (30 dBm)

Note:

- 1) Conducted output power limit B is the 26 dB emission bandwidth.
- 2) Maximum e.i.r.p. limit B is the 99% emission bandwidth.

Test procedure

ANSI C63.10-2013-Section 12.3.3.2 and 14.2
 KDB 789033 D02 v02r01 - Section E.2.d) or E.3.a)
 KDB 662911 D01 v02r01 – Section F)

Test settings

Used test method is Section E.2.d) and Section E.3.a)

◆ KDB 789033 D02 v02r01

Section E.2.d)

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

- (i) Measure the duty cycle, x , of the transmitter output signal as described in II.B..
- (ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (iii) Set RBW = 1 MHz
- (iv) Set RBW $\geq$ 3 MHz
- (v) Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- (vi) Sweep time = auto.
- (vii) Detector = power averaging (rms), if available. Otherwise use sample detector mode.
- (viii) Do not use sweep triggering. Allow the sweep to “free run.”
- (ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- (x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (xi) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log (1/0.25) = 6 \text{ dB}$ if the duty cycle is 25%.

Section E.3.a)

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

- (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
 - The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
 - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
 - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five
- (ii) If the transmitter does not transmit continuously, measure the duty cycle, x , of the transmitter output signal as described in II
- (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%).

Notes: All channels except the straddle channel which RU allocation included in the straddle band were measured with a power meter.

Test results

[DC 5 V]

802.11ax HE20 SISO in the UNII-1 band

Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 180	26T	0	10.87	-	10.87	23.98	22.60
			4	11.72	-	11.72	23.98	22.23
			8	11.21	-	11.21	23.98	22.61
		52T	37	14.37	-	14.37	23.98	22.55
			38	14.89	-	14.89	23.98	22.23
			40	14.67	-	14.67	23.98	22.55
		106T	53	14.68	-	14.68	23.98	22.54
			54	14.89	-	14.89	23.98	22.56
		242T	61	14.75	-	14.75	23.98	22.76
		SU	-	14.83	-	14.83	23.98	22.76
Mid	5 200	26T	0	11.18	-	11.18	23.98	22.61
			4	11.84	-	11.84	23.98	22.23
			8	10.90	-	10.90	23.98	22.62
		52T	37	14.64	-	14.64	23.98	22.56
			38	15.04	-	15.04	23.98	22.23
			40	14.31	-	14.31	23.98	22.56
		106T	53	14.86	-	14.86	23.98	22.55
			54	14.60	-	14.60	23.98	22.56
		242T	61	14.76	-	14.76	23.98	22.76
		SU	-	14.74	-	14.74	23.98	22.75
High	5 240	26T	0	6.39	-	6.39	23.98	22.61
			4	7.40	-	7.40	23.98	22.22
			8	6.75	-	6.75	23.98	22.62
		52T	37	9.15	-	9.15	23.98	22.56
			38	9.80	-	9.80	23.98	22.25
			40	9.53	-	9.53	23.98	22.57
		106T	53	12.51	-	12.51	23.98	22.52
			54	12.71	-	12.71	23.98	22.56
		242T	61	14.89	-	14.89	23.98	22.76
		SU	-	14.91	-	14.91	23.98	22.76

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 180	26T	0	10.87	0.90	11.77	22.60
			4	11.72		12.62	22.23
			8	11.21		12.11	22.61
		52T	37	14.37		15.27	22.55
			38	14.89		15.79	22.23
			40	14.67		15.57	22.55
		106T	53	14.68		15.58	22.54
			54	14.89		15.79	22.56
		242T	61	14.75		15.65	22.76
		SU	-	14.83		15.73	22.76
		26T	0	11.18		12.08	22.61
			4	11.84		12.74	22.23
			8	10.90		11.80	22.62
Mid	5 200	52T	37	14.64	0.90	15.54	22.56
			38	15.04		15.94	22.23
			40	14.31		15.21	22.56
		106T	53	14.86		15.76	22.55
			54	14.60		15.50	22.56
		242T	61	14.76		15.66	22.76
		SU	-	14.74		15.64	22.75
		26T	0	6.39		7.29	22.61
			4	7.40		8.30	22.22
			8	6.75		7.65	22.62
		52T	37	9.15		10.05	22.56
			38	9.80		10.70	22.25
			40	9.53		10.43	22.57
High	5 240	106T	53	12.51	0.90	13.41	22.52
			54	12.71		13.61	22.56
		242T	61	14.89		15.79	22.76
		SU	-	14.91		15.81	22.76
		26T	0	6.39		7.29	22.61
			4	7.40		8.30	22.22
			8	6.75		7.65	22.62
		52T	37	9.15		10.05	22.56

Notes:

1. E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-2A band
Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 260	26T	0	8.43	-	8.43	23.97	23.61
			4	9.03	-	9.03	23.60	23.23
			8	7.97	-	7.97	23.98	23.62
		52T	37	11.23	-	11.23	23.95	23.55
			38	11.57	-	11.57	23.64	23.23
			40	10.76	-	10.76	23.98	23.56
		106T	53	13.81	-	13.81	23.98	23.54
			54	13.57	-	13.57	23.98	23.56
		242T	61	14.86	-	14.86	23.98	23.76
		SU	-	14.97	-	14.97	23.98	23.75
Mid	5 280	26T	0	8.24	-	8.24	23.98	23.61
			4	8.91	-	8.91	23.58	23.23
			8	8.38	-	8.38	23.98	23.63
		52T	37	10.98	-	10.98	23.96	23.55
			38	11.47	-	11.47	23.64	23.25
			40	11.08	-	11.08	23.98	23.57
		106T	53	13.77	-	13.77	23.98	23.54
			54	13.87	-	13.87	23.98	23.57
		242T	61	14.97	-	14.97	23.98	23.76
		SU	-	15.00	-	15.00	23.98	23.76
High	5 320	26T	0	8.52	-	8.52	23.97	23.61
			4	8.93	-	8.93	23.60	23.22
			8	8.04	-	8.04	23.98	23.62
		52T	37	11.23	-	11.23	23.96	23.55
			38	11.55	-	11.55	23.64	23.25
			40	10.77	-	10.77	23.98	23.56
		106T	53	13.74	-	13.74	23.98	23.54
			54	13.59	-	13.59	23.98	23.56
		242T	61	14.91	-	14.91	23.98	23.77
		SU	-	14.94	-	14.94	23.98	23.75

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 260	26T	0	8.43	0.20	8.63	29.61
			4	9.03		9.23	29.23
			8	7.97		8.17	29.62
		52T	37	11.23		11.43	29.55
			38	11.57		11.77	29.23
			40	10.76		10.96	29.56
		106T	53	13.81		14.01	29.54
			54	13.57		13.77	29.56
		242T	61	14.86		15.06	29.76
		SU	-	14.97		15.17	29.75
Mid	5 280	26T	0	8.24	0.20	8.44	29.61
			4	8.91		9.11	29.23
			8	8.38		8.58	29.63
		52T	37	10.98		11.18	29.55
			38	11.47		11.67	29.25
			40	11.08		11.28	29.57
		106T	53	13.77		13.97	29.54
			54	13.87		14.07	29.57
		242T	61	14.97		15.17	29.76
		SU	-	15.00		15.20	29.76
High	5 320	26T	0	8.52	0.20	8.72	29.61
			4	8.93		9.13	29.22
			8	8.04		8.24	29.62
		52T	37	11.23		11.43	29.55
			38	11.55		11.75	29.25
			40	10.77		10.97	29.56
		106T	53	13.74		13.94	29.54
			54	13.59		13.79	29.56
		242T	61	14.91		15.11	29.77
		SU	-	14.94		15.14	29.75

Notes:

1. E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-2C band
Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 500	26T	0	12.36	-	12.36	23.97	23.61
			4	13.16	-	13.16	23.60	23.23
			8	12.67	-	12.67	23.98	23.63
		52T	37	14.46	-	14.46	23.95	23.55
			38	14.80	-	14.80	23.64	23.23
			40	14.63	-	14.63	23.98	23.57
		106T	53	14.66	-	14.66	23.98	23.55
			54	14.79	-	14.79	23.98	23.56
		242T	61	14.74	-	14.74	23.98	23.76
		SU	-	14.80	-	14.80	23.98	23.83
Mid	5 580	26T	0	12.74	-	12.74	23.98	23.61
			4	13.41	-	13.41	23.60	23.23
			8	12.80	-	12.80	23.98	23.62
		52T	37	14.87	-	14.87	23.96	23.56
			38	15.21	-	15.21	23.97	23.23
			40	14.74	-	14.74	23.98	23.56
		106T	53	15.00	-	15.00	23.98	23.54
			54	14.95	-	14.95	23.98	23.56
		242T	61	14.94	-	14.94	23.98	23.76
		SU	-	15.00	-	15.00	23.98	23.76
High	5 700	26T	0	13.07	-	13.07	23.97	23.67
			4	13.55	-	13.55	23.60	23.23
			8	12.66	-	12.66	23.98	23.63
		52T	37	15.04	-	15.04	23.96	23.55
			38	15.38	-	15.38	23.63	23.23
			40	14.56	-	14.56	23.98	23.57
		106T	53	15.22	-	15.22	23.98	23.54
			54	14.85	-	14.85	23.98	23.56
		242T	61	15.05	-	15.05	23.98	23.76
		SU	-	15.04	-	15.04	23.98	23.76
Straddle	5 720	26T	0	12.08	-	12.08	22.79	23.60
			4	12.65	-	12.65	22.47	23.22
		52T	37	13.95	-	13.95	22.77	23.55
			38	14.43	-	14.43	22.50	23.23
		106T	53	14.25	-	14.25	22.77	23.54

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 500	26T	0	12.36	-0.40	11.96	29.61
			4	13.16		12.76	29.23
			8	12.67		12.27	29.63
		52T	37	14.46		14.06	29.55
			38	14.80		14.40	29.23
			40	14.63		14.23	29.57
		106T	53	14.66		14.26	29.55
			54	14.79		14.39	29.56
		242T	61	14.74		14.34	29.76
		SU	-	14.80		14.40	29.83
Mid	5 580	26T	0	12.74	-0.40	12.34	29.61
			4	13.41		13.01	29.23
			8	12.80		12.40	29.62
		52T	37	14.87		14.47	29.56
			38	15.21		14.81	29.23
			40	14.74		14.34	29.56
		106T	53	15.00		14.60	29.54
			54	14.95		14.55	29.56
		242T	61	14.94		14.54	29.76
		SU	-	15.00		14.60	29.76
High	5 700	26T	0	13.07	-0.40	12.67	29.67
			4	13.55		13.15	29.23
			8	12.66		12.26	29.63
		52T	37	15.04		14.64	29.55
			38	15.38		14.98	29.23
			40	14.56		14.16	29.57
		106T	53	15.22		14.82	29.54
			54	14.85		14.45	29.56
		242T	61	15.05		14.65	29.76
		SU	-	15.04		14.64	29.76
Straddle	5 720	26T	0	12.08	-0.40	11.68	29.60
			4	12.65		12.25	29.22
		52T	37	13.95		13.55	29.55
			38	14.43		14.03	29.23
		106T	53	14.25		13.85	29.54

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-3 band
Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Straddle	5 720	26T	8	12.96	-	12.96	30.00	30.00
		52T	40	14.80	-	14.80	30.00	30.00
Low	5 745	26T	0	11.28	-	11.28	30.00	30.00
			4	12.10	-	12.10	30.00	30.00
			8	11.11	-	11.11	30.00	30.00
		52T	37	11.64	-	11.64	30.00	30.00
			38	11.99	-	11.99	30.00	30.00
			40	11.38	-	11.38	30.00	30.00
		106T	53	11.81	-	11.81	30.00	30.00
			54	11.67	-	11.67	30.00	30.00
		242T	61	11.76	-	11.76	30.00	30.00
		SU	-	11.72	-	11.72	30.00	30.00
Mid	5 785	26T	0	11.09	-	11.09	30.00	30.00
			4	11.80	-	11.80	30.00	30.00
			8	11.13	-	11.13	30.00	30.00
		52T	37	11.35	-	11.35	30.00	30.00
			38	11.83	-	11.83	30.00	30.00
			40	11.36	-	11.36	30.00	30.00
		106T	53	11.60	-	11.60	30.00	30.00
			54	11.60	-	11.60	30.00	30.00
		242T	61	11.61	-	11.61	30.00	30.00
		SU	-	11.58	-	11.58	30.00	30.00
High	5 825	26T	0	10.92	-	10.92	30.00	30.00
			4	11.39	-	11.39	30.00	30.00
			8	10.73	-	10.73	30.00	30.00
		52T	37	11.12	-	11.12	30.00	30.00
			38	11.49	-	11.49	30.00	30.00
			40	10.93	-	10.93	30.00	30.00
		106T	53	11.31	-	11.31	30.00	30.00
			54	11.16	-	11.16	30.00	30.00
		242T	61	11.25	-	11.25	30.00	30.00
		SU	-	11.26	-	11.26	30.00	30.00

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Straddle	5 720	26T	8	12.96	-0.70	12.26	30.00
		52T	40	14.80		14.10	30.00
Low	5 745	26T	0	11.28		10.58	30.00
			4	12.10		11.40	30.00
			8	11.11		10.41	30.00
		52T	37	11.64		10.94	30.00
			38	11.99		11.29	30.00
			40	11.38		10.68	30.00
		106T	53	11.81		11.11	30.00
			54	11.67		10.97	30.00
		242T	61	11.76		11.06	30.00
		SU	-	11.72		11.02	30.00
Mid	5 785	26T	0	11.09		10.39	30.00
			4	11.80		11.10	30.00
			8	11.13		10.43	30.00
		52T	37	11.35		10.65	30.00
			38	11.83		11.13	30.00
			40	11.36		10.66	30.00
		106T	53	11.60		10.90	30.00
			54	11.60		10.90	30.00
		242T	61	11.61		10.91	30.00
		SU	-	11.58		10.88	30.00
High	5 825	26T	0	10.92		10.22	30.00
			4	11.39		10.69	30.00
			8	10.73		10.03	30.00
		52T	37	11.12		10.42	30.00
			38	11.49		10.79	30.00
			40	10.93		10.23	30.00
		106T	53	11.31		10.61	30.00
			54	11.16		10.46	30.00
		242T	61	11.25		10.55	30.00
		SU	-	11.26		10.56	30.00

Note:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the Straddle Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
UNII-2C	5 720	106T	54	11.08	-	11.08	22.89	22.30
		242T	61	13.35	-	13.35	22.61	22.58
		SU	-	13.38	-	13.38	22.80	22.58
UNII-3		106T	54	11.48	-	11.48	30.00	30.00
		242T	61	7.97	-	7.97	30.00	30.00
		SU	-	8.02	-	8.02	30.00	30.00

Note:

1. Conducted Output power(dBm) = Average Reading (dBm) + DCF(dB)

802.11ax HE20 SISO in the Straddle E.I.R.P.

Band	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
UNII-2C	5 720	106T	54	11.08	-0.40	11.14	28.30
		242T	61	13.35		13.37	28.58
		SU	-	13.38		13.42	28.58
UNII-3		106T	54	11.48	-0.70	11.53	30.00
		242T	61	7.97		7.99	30.00
		SU	-	8.02		8.06	30.00

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

[DC 12 V]
802.11ax HE20 SISO in the UNII-1 band
Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 180	26T	0	10.94	-	10.94	23.98	22.61
			4	11.74	-	11.74	23.98	22.22
			8	11.21	-	11.21	23.98	22.63
		52T	37	14.37	-	14.37	23.98	22.56
			38	14.93	-	14.93	23.98	22.25
			40	14.64	-	14.64	23.98	22.56
		106T	53	14.71	-	14.71	23.98	22.54
			54	14.86	-	14.86	23.98	22.57
		242T	61	14.76	-	14.76	23.98	22.76
		SU	-	14.78	-	14.78	23.98	22.76
Mid	5 200	26T	0	11.27	-	11.27	23.98	22.60
			4	11.79	-	11.79	23.98	22.21
			8	10.88	-	10.88	23.98	22.54
		52T	37	14.61	-	14.61	23.98	22.56
			38	15.07	-	15.07	23.98	22.23
			40	14.26	-	14.26	23.98	22.56
		106T	53	14.87	-	14.87	23.98	22.55
			54	14.62	-	14.62	23.98	22.57
		242T	61	14.73	-	14.73	23.98	22.76
		SU	-	14.77	-	14.77	23.98	22.76
High	5 240	26T	0	6.46	-	6.46	23.98	22.61
			4	7.34	-	7.34	23.98	22.23
			8	6.78	-	6.78	23.98	22.63
		52T	37	9.21	-	9.21	23.98	22.55
			38	9.79	-	9.79	23.98	22.23
			40	9.50	-	9.50	23.98	22.57
		106T	53	12.48	-	12.48	23.98	22.54
			54	12.74	-	12.74	23.98	22.56
		242T	61	14.88	-	14.88	23.98	22.76
		SU	-	14.91	-	14.91	23.98	22.74

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 180	26T	0	10.94	0.90	11.84	22.61
			4	11.74		12.64	22.22
			8	11.21		12.11	22.63
		52T	37	14.37		15.27	22.56
			38	14.93		15.83	22.25
			40	14.64		15.54	22.56
		106T	53	14.71		15.61	22.54
			54	14.86		15.76	22.57
		242T	61	14.76		15.66	22.76
		SU	-	14.78		15.68	22.76
Mid	5 200	26T	0	11.27	0.90	12.17	22.60
			4	11.79		12.69	22.21
			8	10.88		11.78	22.54
		52T	37	14.61		15.51	22.56
			38	15.07		15.97	22.23
			40	14.26		15.16	22.56
		106T	53	14.87		15.77	22.55
			54	14.62		15.52	22.57
		242T	61	14.73		15.63	22.76
		SU	-	14.77		15.67	22.76
High	5 240	26T	0	6.46	0.90	7.36	22.61
			4	7.34		8.24	22.23
			8	6.78		7.68	22.63
		52T	37	9.21		10.11	22.55
			38	9.79		10.69	22.23
			40	9.50		10.40	22.57
		106T	53	12.48		13.38	22.54
			54	12.74		13.64	22.56
		242T	61	14.88		15.78	22.76
		SU	-	14.91		15.81	22.74

Notes:

1. E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-2A band

Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 260	26T	0	8.52	-	8.52	23.98	23.61
			4	8.96	-	8.96	23.58	23.23
			8	7.96	-	7.96	23.98	23.63
		52T	37	11.24	-	11.24	23.95	23.55
			38	11.57	-	11.57	23.64	23.23
			40	10.79	-	10.79	23.98	23.57
		106T	53	13.88	-	13.88	23.98	23.54
			54	13.55	-	13.55	23.98	23.56
		242T	61	14.94	-	14.94	23.98	23.76
		SU	-	14.96	-	14.96	23.98	23.75
Mid	5 280	26T	0	8.33	-	8.33	23.97	23.61
			4	8.94	-	8.94	23.58	23.23
			8	8.35	-	8.35	23.98	23.63
		52T	37	10.95	-	10.95	23.96	23.56
			38	11.44	-	11.44	23.64	23.23
			40	11.10	-	11.10	23.98	23.57
		106T	53	13.81	-	13.81	23.98	23.54
			54	13.85	-	13.85	23.98	23.57
		242T	61	15.01	-	15.01	23.98	23.76
		SU	-	15.01	-	15.01	23.98	23.76
High	5 320	26T	0	8.57	-	8.57	23.96	23.61
			4	8.97	-	8.97	23.60	23.23
			8	8.03	-	8.03	23.98	23.63
		52T	37	11.26	-	11.26	23.96	23.56
			38	11.63	-	11.63	23.64	23.23
			40	10.78	-	10.78	23.98	23.56
		106T	53	13.92	-	13.92	23.98	23.54
			54	13.57	-	13.57	23.98	23.56
		242T	61	14.94	-	14.94	23.98	23.76
		SU	-	14.96	-	14.96	23.98	23.76

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 260	26T	0	8.52	0.20	8.72	29.61
			4	8.96		9.16	29.23
			8	7.96		8.16	29.63
		52T	37	11.24		11.44	29.55
			38	11.57		11.77	29.23
			40	10.79		10.99	29.57
		106T	53	13.88		14.08	29.54
			54	13.55		13.75	29.56
		242T	61	14.94		15.14	29.76
		SU	-	14.96		15.16	29.75
Mid	5 280	26T	0	8.33	0.20	8.53	29.61
			4	8.94		9.14	29.23
			8	8.35		8.55	29.63
		52T	37	10.95		11.15	29.56
			38	11.44		11.64	29.23
			40	11.10		11.30	29.57
		106T	53	13.81		14.01	29.54
			54	13.85		14.05	29.57
		242T	61	15.01		15.21	29.76
		SU	-	15.01		15.21	29.76
High	5 320	26T	0	8.57	0.20	8.77	29.61
			4	8.97		9.17	29.23
			8	8.03		8.23	29.63
		52T	37	11.26		11.46	29.56
			38	11.63		11.83	29.23
			40	10.78		10.98	29.56
		106T	53	13.92		14.12	29.54
			54	13.57		13.77	29.56
		242T	61	14.94		15.14	29.76
		SU	-	14.96		15.16	29.76

Notes:

1. E.I.R.P. Calculation: E.I.R.P. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-2C band Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Low	5 500	26T	0	12.43	-	12.43	23.97	23.61
			4	13.13	-	13.13	23.60	23.22
			8	12.70	-	12.70	23.98	23.63
		52T	37	14.42	-	14.42	23.95	23.55
			38	14.84	-	14.84	23.64	23.25
			40	14.57	-	14.57	23.98	23.57
		106T	53	14.67	-	14.67	23.98	23.55
			54	14.81	-	14.81	23.98	23.57
		242T	61	14.72	-	14.72	23.98	23.76
SU	-	14.73	-	14.73	23.98	23.76		
Mid	5 580	26T	0	12.93	-	12.93	23.98	23.61
			4	13.37	-	13.37	23.60	23.23
			8	12.85	-	12.85	23.98	23.63
		52T	37	14.81	-	14.81	23.96	23.56
			38	15.20	-	15.20	23.97	23.23
			40	14.68	-	14.68	23.98	23.56
		106T	53	15.06	-	15.06	23.98	23.54
			54	14.94	-	14.94	23.98	23.56
		242T	61	15.01	-	15.01	23.98	23.76
SU	-	15.01	-	15.01	23.98	23.75		
High	5 700	26T	0	13.13	-	13.13	23.97	23.61
			4	13.51	-	13.51	23.60	23.23
			8	12.67	-	12.67	23.98	23.63
		52T	37	15.00	-	15.00	23.96	23.56
			38	15.36	-	15.36	23.63	23.23
			40	14.54	-	14.54	23.98	23.56
		106T	53	15.19	-	15.19	23.98	23.54
			54	14.87	-	14.87	23.98	23.57
		242T	61	15.03	-	15.03	23.98	23.76
SU	-	15.04	-	15.04	23.98	23.74		
Straddle	5 720	26T	0	12.15	-	12.15	22.79	23.60
			4	12.70	-	12.70	22.47	23.22
		52T	37	13.99	-	13.99	22.77	23.55
			38	14.41	-	14.41	22.50	23.23
		106T	53	14.25	-	14.25	22.77	23.52

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Low	5 500	26T	0	12.43	-0.40	12.03	29.61
			4	13.13		12.73	29.22
			8	12.70		12.30	29.63
		52T	37	14.42		14.02	29.55
			38	14.84		14.44	29.25
			40	14.57		14.17	29.57
		106T	53	14.67		14.27	29.55
			54	14.81		14.41	29.57
		242T	61	14.72		14.32	29.76
		SU	-	14.73		14.33	29.76
Mid	5 580	26T	0	12.93	-0.40	12.53	29.61
			4	13.37		12.97	29.23
			8	12.85		12.45	29.63
		52T	37	14.81		14.41	29.56
			38	15.20		14.80	29.23
			40	14.68		14.28	29.56
		106T	53	15.06		14.66	29.54
			54	14.94		14.54	29.56
		242T	61	15.01		14.61	29.76
		SU	-	15.01		14.61	29.75
High	5 700	26T	0	13.13	-0.40	12.73	29.61
			4	13.51		13.11	29.23
			8	12.67		12.27	29.63
		52T	37	15.00		14.60	29.56
			38	15.36		14.96	29.23
			40	14.54		14.14	29.56
		106T	53	15.19		14.79	29.54
			54	14.87		14.47	29.57
		242T	61	15.03		14.63	29.76
		SU	-	15.04		14.64	29.74
Straddle	5 720	26T	0	12.15	-0.40	11.75	29.60
			4	12.70		12.30	29.22
		52T	37	13.99		13.59	29.55
			38	14.41		14.01	29.23
		106T	53	14.25		13.85	29.52

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the UNII-3 band
Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
Straddle	5 720	26T	8	12.94	-	12.94	30.00	30.00
		52T	40	14.82	-	14.82	30.00	30.00
Low	5 745	26T	0	11.34	-	11.34	30.00	30.00
			4	12.05	-	12.05	30.00	30.00
			8	11.14	-	11.14	30.00	30.00
		52T	37	11.60	-	11.60	30.00	30.00
			38	12.08	-	12.08	30.00	30.00
			40	11.39	-	11.39	30.00	30.00
		106T	53	11.79	-	11.79	30.00	30.00
			54	11.68	-	11.68	30.00	30.00
		242T	61	11.73	-	11.73	30.00	30.00
		SU	-	11.75	-	11.75	30.00	30.00
Mid	5 785	26T	0	11.14	-	11.14	30.00	30.00
			4	11.83	-	11.83	30.00	30.00
			8	11.14	-	11.14	30.00	30.00
		52T	37	11.36	-	11.36	30.00	30.00
			38	11.80	-	11.80	30.00	30.00
			40	11.35	-	11.35	30.00	30.00
		106T	53	11.58	-	11.58	30.00	30.00
			54	11.62	-	11.62	30.00	30.00
		242T	61	11.59	-	11.59	30.00	30.00
		SU	-	11.61	-	11.61	30.00	30.00
High	5 825	26T	0	10.91	-	10.91	30.00	30.00
			4	11.41	-	11.41	30.00	30.00
			8	10.72	-	10.72	30.00	30.00
		52T	37	11.15	-	11.15	30.00	30.00
			38	11.46	-	11.46	30.00	30.00
			40	10.96	-	10.96	30.00	30.00
		106T	53	11.29	-	11.29	30.00	30.00
			54	11.19	-	11.19	30.00	30.00
		242T	61	11.27	-	11.27	30.00	30.00
		SU	-	11.24	-	11.24	30.00	30.00

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

E.I.R.P.

Channel	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
Straddle	5 720	26T	8	12.94	-0.70	12.24	30.00
		52T	40	14.82		14.12	30.00
Low	5 745	26T	0	11.34		10.83	30.00
			4	12.05		7.29	30.00
			8	11.14		7.36	30.00
		52T	37	11.60		10.64	30.00
			38	12.08		11.35	30.00
			40	11.39		10.44	30.00
		106T	53	11.79		10.90	30.00
			54	11.68		11.38	30.00
		242T	61	11.73		10.69	30.00
		SU	-	11.75		11.09	30.00
Mid	5 785	26T	0	11.14		10.98	30.00
			4	11.83		11.03	30.00
			8	11.14		11.05	30.00
		52T	37	11.36		10.44	30.00
			38	11.80		11.13	30.00
			40	11.35		10.44	30.00
		106T	53	11.58		10.66	30.00
			54	11.62		11.10	30.00
		242T	61	11.59		10.65	30.00
		SU	-	11.61		10.88	30.00
High	5 825	26T	0	10.91		10.92	30.00
			4	11.41		10.89	30.00
			8	10.72		10.91	30.00
		52T	37	11.15		10.21	30.00
			38	11.46		10.71	30.00
			40	10.96		10.02	30.00
		106T	53	11.29		10.45	30.00
			54	11.19		10.76	30.00
		242T	61	11.27		10.26	30.00
		SU	-	11.24		10.59	30.00

Note:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

802.11ax HE20 SISO in the Straddle Conducted Output Power

Channel	Frequency (MHz)	Tones	RU offset	Measured output power			FCC Limit (dBm)	IC Limit (dBm)
				Reading (dBm)	DCF (dB)	Result (dBm)		
				ANT				
UNII-2C	5 720	106T	54	11.14	-	11.14	22.87	22.30
		242T	61	13.37	-	13.37	22.89	22.58
		SU	-	13.42	-	13.42	22.80	22.58
UNII-3		106T	54	11.53	-	11.53	30.00	30.00
		242T	61	7.99	-	7.99	30.00	30.00
		SU	-	8.06	-	8.06	30.00	30.00

Note:

1. Conducted Output power(dB m) = Average Reading (dB m) + DCF(dB)

802.11ax HE20 SISO in the Straddle E.I.R.P.

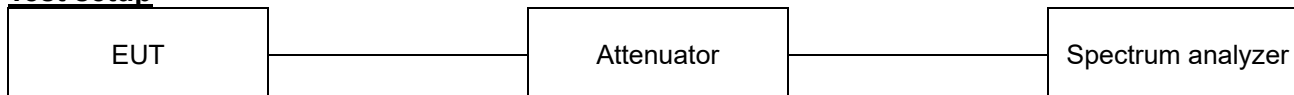
Band	Frequency (MHz)	Tones	RU offset	Conducted Output Power (dBm)	ANT gain (dBi)	MAX e.i.r.p (dBm)	MAX e.i.r.p Limit (dBm)
UNII-2C	5 720	106T	54	11.14	-0.40	10.74	28.30
		242T	61	13.37		12.97	28.58
		SU	-	13.42		13.02	28.58
UNII-3		106T	54	11.53	-0.70	10.83	30.00
		242T	61	7.99		7.29	30.00
		SU	-	8.06		7.36	30.00

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

7.2. Maximum Power Spectral Density

Test setup



Limit

According to §15.407(a), RSS-247(6.2)

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

Test procedure

ANSI C63.10-2013 Section 12.3.2.2, 14.3.2.2

KDB 789033 D02 v02r01 - Section E and F

KDB 662911 D01 v02r01 - Section E). 2) and Section F)

Test settings

Section F

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

- Create an average power spectrum for the EUT operating mode being tested by following the instructions in II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power...” (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
- Search function on the instrument to find the peak of the spectrum and record its value.
- Adjustments to the peak value of the spectrum, if applicable:
 - 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.
 - If Method SA-3 Alternative was used and the linear mode was used in II.E.2.g) (viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
- The result is the Maximum PSD over 1MHz reference bandwidth
- For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the preceding procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 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 RBWs less than 1MHz, 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 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 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 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 II.F.5.c) and II.F.5.d), since $RBW=100 \text{ kHz}$ is available on nearly all spectrum analyzers.
- Method SA-2 is used.
- Please refer to Appendix A for plots

Test results

[DC 5 V]

802.11ax HE20 SISO in the UNII-1 band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 180	26T	0	7.39	-	7.39	11.00
			4	7.05	-	7.05	11.00
			8	7.48	-	7.48	11.00
		52T	37	8.95	-	8.95	11.00
			38	9.16	-	9.16	11.00
			40	9.02	-	9.02	11.00
		106T	53	6.09	-	6.09	11.00
			54	6.26	-	6.26	11.00
		242T	61	2.64	-	2.64	11.00
		SU	-	2.69	-	2.69	11.00
Mid	5 200	26T	0	7.52	-	7.52	11.00
			4	7.10	-	7.10	11.00
			8	7.47	-	7.47	11.00
		52T	37	8.98	-	8.98	11.00
			38	9.26	-	9.26	11.00
			40	9.06	-	9.06	11.00
		106T	53	6.12	-	6.12	11.00
			54	6.23	-	6.23	11.00
		242T	61	2.79	-	2.79	11.00
		SU	-	2.77	-	2.77	11.00
High	5 240	26T	0	3.02	-	3.02	11.00
			4	2.59	-	2.59	11.00
			8	2.83	-	2.83	11.00
		52T	37	3.07	-	3.07	11.00
			38	3.28	-	3.28	11.00
			40	2.90	-	2.90	11.00
		106T	53	3.74	-	3.74	11.00
			54	3.69	-	3.69	11.00
		242T	61	2.65	-	2.65	11.00
		SU	-	2.64	-	2.64	11.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-2A band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 260	26T	0	4.67	-	4.67	11.00
			4	4.38	-	4.38	11.00
			8	4.63	-	4.63	11.00
		52T	37	4.79	-	4.79	11.00
			38	4.99	-	4.99	11.00
			40	4.74	-	4.74	11.00
		106T	53	5.38	-	5.38	11.00
			54	5.45	-	5.45	11.00
		242T	61	2.91	-	2.91	11.00
		SU	-	2.96	-	2.96	11.00
Mid	5 280	26T	0	4.86	-	4.86	11.00
			4	4.32	-	4.32	11.00
			8	4.75	-	4.75	11.00
		52T	37	4.84	-	4.84	11.00
			38	5.09	-	5.09	11.00
			40	4.88	-	4.88	11.00
		106T	53	5.40	-	5.40	11.00
			54	5.38	-	5.38	11.00
		242T	61	3.01	-	3.01	11.00
		SU	-	3.04	-	3.04	11.00
High	5 320	26T	0	4.79	-	4.79	11.00
			4	4.46	-	4.46	11.00
			8	4.80	-	4.80	11.00
		52T	37	4.90	-	4.90	11.00
			38	5.10	-	5.10	11.00
			40	4.98	-	4.98	11.00
		106T	53	5.52	-	5.52	11.00
			54	5.55	-	5.55	11.00
		242T	61	3.07	-	3.07	11.00
		SU	-	3.07	-	3.07	11.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-2C band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 500	26T	0	9.65	-	9.65	11.00
			4	9.26	-	9.26	11.00
			8	9.57	-	9.57	11.00
		52T	37	8.94	-	8.94	11.00
			38	9.21	-	9.21	11.00
			40	8.91	-	8.91	11.00
		106T	53	6.05	-	6.05	11.00
			54	6.10	-	6.10	11.00
		242T	61	2.66	-	2.66	11.00
Mid	5 580	26T	0	9.80	-	9.80	11.00
			4	9.49	-	9.49	11.00
			8	9.95	-	9.95	11.00
		52T	37	9.05	-	9.05	11.00
			38	9.30	-	9.30	11.00
			40	9.21	-	9.21	11.00
		106T	53	6.30	-	6.30	11.00
			54	6.31	-	6.31	11.00
		242T	61	2.74	-	2.74	11.00
High	5 700	26T	0	9.73	-	9.73	11.00
			4	9.15	-	9.15	11.00
			8	9.54	-	9.54	11.00
		52T	37	8.83	-	8.83	11.00
			38	9.04	-	9.04	11.00
			40	8.80	-	8.80	11.00
		106T	53	6.01	-	6.01	11.00
			54	5.96	-	5.96	11.00
		242T	61	2.57	-	2.57	11.00
Straddle	5 720	26T	0	9.29	-	9.29	11.00
			4	8.73	-	8.73	11.00
		52T	37	8.56	-	8.56	11.00
			38	8.79	-	8.79	11.00
		106T	53	5.69	-	5.69	11.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-3 band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/500kHz)	DCF (dB)	Maximum PSD (dBm/500kHz)	Maximum PSD Limit (dBm/500kHz)
						Average	
Straddle	5 720	26T	8	6.27	-	6.27	30.00
		52T	40	5.35	-	5.35	30.00
Low	5 745	26T	0	5.07	-	5.07	30.00
			4	5.35	-	5.35	30.00
			8	4.79	-	4.79	30.00
		52T	37	2.51	-	2.51	30.00
			38	2.57	-	2.57	30.00
			40	2.53	-	2.53	30.00
		106T	53	-0.36	-	-0.36	30.00
			54	-0.52	-	-0.52	30.00
		242T	61	-3.93	-	-3.93	30.00
		SU	-	-3.92	-	-3.92	30.00
Mid	5 785	26T	0	5.02	-	5.02	30.00
			4	5.52	-	5.52	30.00
			8	4.76	-	4.76	30.00
		52T	37	2.46	-	2.46	30.00
			38	2.66	-	2.66	30.00
			40	2.26	-	2.26	30.00
		106T	53	-0.34	-	-0.34	30.00
			54	-0.52	-	-0.52	30.00
		242T	61	-3.98	-	-3.98	30.00
		SU	-	-3.93	-	-3.93	30.00
High	5 825	26T	0	4.78	-	4.78	30.00
			4	5.02	-	5.02	30.00
			8	4.54	-	4.54	30.00
		52T	37	2.25	-	2.25	30.00
			38	2.36	-	2.36	30.00
			40	2.09	-	2.09	30.00
		106T	53	-0.70	-	-0.70	30.00
			54	-0.66	-	-0.66	30.00
		242T	61	-4.20	-	-4.20	30.00
		SU	-	-4.14	-	-4.14	30.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/500 kHz) + DCF(dB)

802.11ax HE20 SISO in the Straddle

Band	Frequency (MHz)	Tones	RU offset	Measured PSD ANT	DCF (dB)	Maximum PSD	Maximum PSD Limit
						Average	
UNII-2C	5 720	106T	54	5.90	-	5.90	11.00
		242T	61	2.46	-	2.46	11.00
		SU	-	2.44	-	2.44	11.00
UNII-3		106T	54	2.74	-	2.74	30.00
		242T	61	-0.62	-	-0.62	30.00
		SU	-	-0.66	-	-0.66	30.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)
2. The Unit of UNII-2C is (dB m / MHz) and Unit of UNII-3 is (dB m / 500 kHz)

[DC 12 V]

802.11ax HE20 SISO in the UNII-1 band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 180	26T	0	7.52	-	7.52	11.00
			4	7.15	-	7.15	11.00
			8	7.64	-	7.64	11.00
		52T	37	8.98	-	8.98	11.00
			38	9.30	-	9.30	11.00
			40	9.09	-	9.09	11.00
		106T	53	6.26	-	6.26	11.00
			54	6.29	-	6.29	11.00
		242T	61	2.83	-	2.83	11.00
Mid	5 200	26T	0	7.64	-	7.64	11.00
			4	7.33	-	7.33	11.00
			8	7.59	-	7.59	11.00
		52T	37	9.17	-	9.17	11.00
			38	9.42	-	9.42	11.00
			40	9.21	-	9.21	11.00
		106T	53	6.36	-	6.36	11.00
			54	6.41	-	6.41	11.00
		242T	61	2.86	-	2.86	11.00
High	5 240	26T	0	3.11	-	3.11	11.00
			4	2.82	-	2.82	11.00
			8	2.97	-	2.97	11.00
		52T	37	3.17	-	3.17	11.00
			38	3.49	-	3.49	11.00
			40	3.15	-	3.15	11.00
		106T	53	3.85	-	3.85	11.00
			54	3.85	-	3.85	11.00
		242T	61	2.77	-	2.77	11.00
		26T	0	2.75	-	2.75	11.00
			4				
			8				
		52T	37				
			38				
			40				
		106T	53				
			54				
		242T	61				

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-2A band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 260	26T	0	5.06	-	5.06	11.00
			4	4.61	-	4.61	11.00
			8	4.83	-	4.83	11.00
		52T	37	4.95	-	4.95	11.00
			38	5.28	-	5.28	11.00
			40	4.95	-	4.95	11.00
		106T	53	5.53	-	5.53	11.00
			54	5.55	-	5.55	11.00
		242T	61	3.19	-	3.19	11.00
		SU	-	3.16	-	3.16	11.00
Mid	5 280	26T	0	5.02	-	5.02	11.00
			4	4.53	-	4.53	11.00
			8	4.80	-	4.80	11.00
		52T	37	4.95	-	4.95	11.00
			38	5.26	-	5.26	11.00
			40	4.96	-	4.96	11.00
		106T	53	5.54	-	5.54	11.00
			54	5.53	-	5.53	11.00
		242T	61	3.23	-	3.23	11.00
		SU	-	3.12	-	3.12	11.00
High	5 320	26T	0	4.95	-	4.95	11.00
			4	4.62	-	4.62	11.00
			8	5.00	-	5.00	11.00
		52T	37	5.00	-	5.00	11.00
			38	5.31	-	5.31	11.00
			40	5.03	-	5.03	11.00
		106T	53	5.64	-	5.64	11.00
			54	5.70	-	5.70	11.00
		242T	61	3.19	-	3.19	11.00
		SU	-	3.21	-	3.21	11.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-2C band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/MHz)	DCF (dB)	Maximum PSD (dBm/MHz)	Maximum PSD Limit (dBm/MHz)
						Average	
Low	5 500	26T	0	9.81	-	9.81	11.00
			4	9.43	-	9.43	11.00
			8	9.81	-	9.81	11.00
		52T	37	8.98	-	8.98	11.00
			38	9.20	-	9.20	11.00
			40	8.97	-	8.97	11.00
		106T	53	6.27	-	6.27	11.00
			54	6.26	-	6.26	11.00
		242T	61	2.69	-	2.69	11.00
Mid	5 580	26T	0	9.92	-	9.92	11.00
			4	9.55	-	9.55	11.00
			8	9.98	-	9.98	11.00
		52T	37	9.05	-	9.05	11.00
			38	9.36	-	9.36	11.00
			40	9.20	-	9.20	11.00
		106T	53	6.24	-	6.24	11.00
			54	6.43	-	6.43	11.00
		242T	61	2.89	-	2.89	11.00
High	5 700	26T	0	9.60	-	9.60	11.00
			4	9.07	-	9.07	11.00
			8	9.59	-	9.59	11.00
		52T	37	8.78	-	8.78	11.00
			38	9.11	-	9.11	11.00
			40	8.81	-	8.81	11.00
		106T	53	6.01	-	6.01	11.00
			54	5.96	-	5.96	11.00
		242T	61	2.44	-	2.44	11.00
Straddle	5 720	26T	0	9.27	-	9.27	11.00
			4	8.85	-	8.85	11.00
		52T	37	8.64	-	8.64	11.00
			38	8.67	-	8.67	11.00
		106T	53	5.71	-	5.71	11.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)

802.11ax HE20 SISO in the UNII-3 band

Channel	Frequency (MHz)	Tones	RU offset	Measured PSD ANT (dBm/500kHz)	DCF (dB)	Maximum PSD (dBm/500kHz)	Maximum PSD Limit (dBm/500kHz)
						Average	
Straddle	5 720	26T	8	6.25	-	6.25	30.00
		52T	40	5.39	-	5.39	30.00
Low	5 745	26T	0	5.14	-	5.14	30.00
			4	5.32	-	5.32	30.00
			8	4.87	-	4.87	30.00
		52T	37	2.54	-	2.54	30.00
			38	2.61	-	2.61	30.00
			40	2.32	-	2.32	30.00
		106T	53	-0.39	-	-0.39	30.00
			54	-0.52	-	-0.52	30.00
		242T	61	-3.89	-	-3.89	30.00
		SU	-	-3.90	-	-3.90	30.00
Mid	5 785	26T	0	5.18	-	5.18	30.00
			4	5.34	-	5.34	30.00
			8	4.87	-	4.87	30.00
		52T	37	2.58	-	2.58	30.00
			38	2.74	-	2.74	30.00
			40	2.42	-	2.42	30.00
		106T	53	-0.36	-	-0.36	30.00
			54	-0.48	-	-0.48	30.00
		242T	61	-3.81	-	-3.81	30.00
		SU	-	-3.80	-	-3.80	30.00
High	5 825	26T	0	5.00	-	5.00	30.00
			4	5.13	-	5.13	30.00
			8	4.54	-	4.54	30.00
		52T	37	2.38	-	2.38	30.00
			38	2.49	-	2.49	30.00
			40	2.13	-	2.13	30.00
		106T	53	-0.62	-	-0.62	30.00
			54	-0.75	-	-0.75	30.00
		242T	61	-4.06	-	-4.06	30.00
		SU	-	-4.09	-	-4.09	30.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/500 kHz) + DCF(dB)

802.11ax HE20 SISO in the Straddle

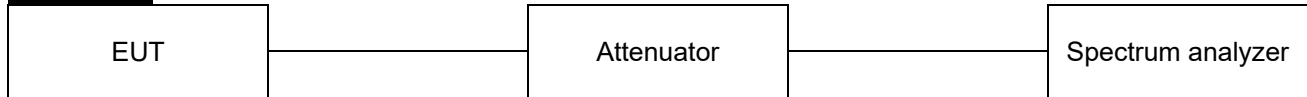
Band	Frequency (MHz)	Tones	RU offset	Measured PSD ANT	DCF (dB)	Maximum PSD	Maximum PSD Limit
						Average	
UNII-2C	5 720	106T	54	5.89	-	5.89	11.00
		242T	61	2.44	-	2.44	11.00
		SU	-	2.48	-	2.48	11.00
UNII-3		106T	54	2.80	-	2.80	30.00
		242T	61	-0.67	-	-0.67	30.00
		SU	-	-0.61	-	-0.61	30.00

Note:

1. Maximum PSD(dB m/MHz) = Reading (dB m/MHz) + DCF(dB)
2. The Unit of UNII-2C is (dB m / MHz) and Unit of UNII-3 is (dB m / 500 kHz)

7.3. 26 dB Bandwidth & 99% Bandwidth

Test setup



Limit

N/A

Test procedure

ANSI C63.10-2013 Section 12.4

KDB 789033 D02 v02r01 - Section C.1 (26dBbandwidth)

KDB 789033 D02 v02r01 - Section D (99% bandwidth)

Test settings

1. 26 dB Bandwidth

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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%.

2. 99% Occupied Bandwidth

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1% to 5% of the OBW
- Set VBW $\geq 3 \times$ RBW
- 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.
- Use the 99% power bandwidth function of the instrument (if available).
- 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.

Note:

- Please refer to Appendix A for plots
- Straddle channels: For 99% Bandwidth, measured 99% occupied bandwidth is separated as below.
 - For UNII-2C = 5 725 MHz – T1 (Measured frequency on the marker table)
 - For UNII 3 = T2 (Measured frequency on the marker table) - 5 725 MHz

Test results

[DC 5 V]

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-1	HE20	5 180	26T	0	19.93	18.18
				4	18.13	16.73
				8	20.23	18.23
			52T	37	19.83	17.98
				38	18.38	16.73
				40	20.18	17.98
			106T	53	20.53	17.93
				54	20.38	18.03
			242T	61	21.08	18.88
			SU	-	20.73	18.88
		5 200	26T	0	21.18	18.23
				4	18.18	16.73
				8	20.23	18.28
			52T	37	19.68	18.03
				38	18.33	16.73
				40	20.18	18.03
			106T	53	20.48	17.98
				54	21.08	18.03
			242T	61	20.88	18.88
			SU	-	20.68	18.83
		5 240	26T	0	19.78	18.23
				4	18.13	16.68
				8	20.23	18.28
			52T	37	19.73	18.03
				38	18.38	16.78
				40	20.23	18.08
			106T	53	20.48	17.88
				54	21.03	18.03
			242T	61	21.13	18.88
			SU	-	20.83	18.88

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2A	HE20	5 260	26T	0	19.83	18.23
				4	18.18	16.73
				8	20.13	18.28
			52T	37	19.73	17.98
				38	18.38	16.73
				40	20.23	18.03
			106T	53	20.53	17.93
				54	21.03	18.03
			242T	61	21.18	18.88
			SU	-	20.78	18.83
		5 280	26T	0	19.88	18.23
				4	18.13	16.73
				8	20.13	18.33
			52T	37	19.78	17.98
				38	18.38	16.78
				40	20.13	18.08
			106T	53	20.53	17.93
				54	21.08	18.08
			242T	61	21.03	18.88
			SU	-	20.83	18.88
		5 320	26T	0	19.83	18.23
				4	18.18	16.68
				8	20.13	18.28
			52T	37	19.78	17.98
				38	18.38	16.78
				40	20.18	18.03
			106T	53	20.58	17.93
				54	21.03	18.03
			242T	61	21.18	18.93
			SU	-	20.78	18.83

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2C	HE20	5 500	26T	0	19.83	18.23
				4	18.18	16.73
				8	20.53	18.33
			52T	37	19.73	17.98
				38	18.38	16.73
				40	20.18	18.08
			106T	53	20.53	17.98
				54	21.03	18.03
			242T	61	21.23	18.88
			SU	-	20.83	19.18
		5 600	26T	0	19.88	18.23
				4	18.18	16.73
				8	20.18	18.28
			52T	37	19.78	18.03
				38	19.83	16.73
				40	20.23	18.03
			106T	53	20.53	17.93
				54	20.43	18.03
			242T	61	21.18	18.88
			SU	-	20.73	18.88
		5 700	26T	0	19.83	18.48
				4	18.18	16.73
				8	20.13	18.33
			52T	37	19.78	17.98
				38	18.33	16.73
				40	20.18	18.08
			106T	53	20.53	17.93
				54	21.03	18.03
			242T	61	21.13	18.88
			SU	-	20.83	18.88



Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2C	HE20	Straddle 5 720	26T	0	15.09	18.18
				4	14.04	16.68
			52T	37	15.04	17.98
				38	14.14	16.73
			106T	53	15.04	17.93
				54*	15.44	13.49
			242T	61*	14.49	14.39
			SU	-*	15.14	14.39

* RU Allocation included in the straddle band



[DC 12 V]

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-1	HE20	5 180	26T	0	19.83	18.23
				4	18.13	16.68
				8	20.13	18.33
			52T	37	19.73	18.03
				38	18.33	16.78
				40	20.13	18.03
			106T	53	20.38	17.93
				54	21.03	18.08
			242T	61	21.13	18.88
			SU	-	20.73	18.88
		5 200	26T	0	19.78	18.18
				4	18.13	16.63
				8	20.08	17.93
			52T	37	19.68	18.03
				38	18.38	16.73
				40	20.13	18.03
			106T	53	20.53	17.98
				54	21.03	18.08
			242T	61	21.08	18.88
			SU	-	20.73	18.88
		5 240	26T	0	19.83	18.23
				4	18.13	16.73
				8	20.23	18.33
			52T	37	19.73	17.98
				38	18.33	16.73
				40	20.18	18.08
			106T	53	20.53	17.93
				54	21.08	18.03
			242T	61	21.23	18.88
			SU	-	20.78	18.78

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2A	HE20	5 260	26T	0	19.88	18.23
				4	18.13	16.73
				8	20.13	18.33
			52T	37	19.73	17.98
				38	18.38	16.73
				40	20.18	18.08
			106T	53	20.53	17.93
				54	21.08	18.03
			242T	61	21.18	18.88
			SU	-	20.78	18.83
		5 280	26T	0	19.83	18.23
				4	18.13	16.73
				8	20.18	18.33
			52T	37	19.78	18.03
				38	18.38	16.73
				40	20.18	18.08
			106T	53	20.58	17.93
				54	21.08	18.08
			242T	61	21.13	18.88
			SU	-	20.78	18.88
		5 320	26T	0	19.78	18.23
				4	18.18	16.73
				8	20.38	18.33
			52T	37	19.78	18.03
				38	18.38	16.73
				40	20.13	18.03
			106T	53	20.53	17.93
				54	21.08	18.03
			242T	61	21.23	18.88
			SU	-	20.83	18.88

Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2C	HE20	5 500	26T	0	19.83	18.23
				4	18.18	16.68
				8	20.28	18.33
			52T	37	19.83	17.98
				38	18.38	16.78
				40	20.23	18.08
			106T	53	20.53	17.98
				54	21.08	18.08
			242T	61	21.18	18.88
			SU	-	20.83	18.88
		5 600	26T	0	19.83	18.23
				4	18.08	16.73
				8	20.18	18.33
			52T	37	19.78	18.03
				38	18.38	16.73
				40	20.18	18.03
			106T	53	20.53	17.93
				54	20.48	18.03
			242T	61	21.13	18.88
			SU	-	20.73	18.83
		5 700	26T	0	19.93	18.23
				4	18.18	16.73
				8	20.13	18.33
			52T	37	19.78	18.03
				38	18.38	16.73
				40	20.28	18.03
			106T	53	20.53	17.93
				54	21.08	18.08
			242T	61	21.23	18.88
			SU	-	20.78	18.78



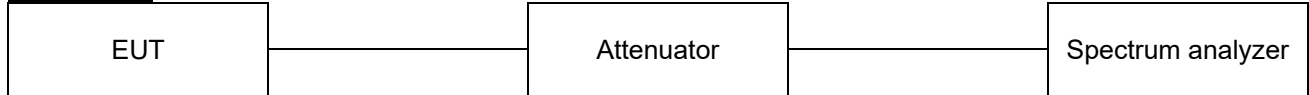
Band	Mode	Frequency (MHz)	Tones	RU offset	26 dB bandwidth (MHz)	99% bandwidth (MHz)
UNII-2C	HE20	Straddle 5 720	26T	0	15.09	18.18
				4	14.04	16.68
			52T	37	15.04	17.98
				38	14.14	16.73
			106T	53	15.04	17.88
				54*	15.39	13.49
			242T	61*	15.44	14.39
			SU	-*	15.14	14.39

* RU Allocation included in the straddle band



7.4. 6 dB Bandwidth & 99% Bandwidth

Test setup



Limit

According to §15.407(e), Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500kHz.

Test procedure

ANSI C63.10-2013 Section 6.9.2

KDB 789033 D02 v02r01 - Section C.2

Test settings

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 and 5.850-5.895 GHz band. The following procedure shall be used for measuring this Bandwidth:

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note:

1. For the 6dB Bandwidth, it was tested at the RU allocation with lowest tones number for each bandwidth
2. * RU Allocation included in the straddle band
3. Straddle channels: For 99% Bandwidth, measured 99% occupied bandwidth is separated as below.
 - For UNII-2C = 5 725 MHz – T1 (Measured frequency on the marker table)
 - For UNII 3 = T2 (Measured frequency on the marker table) - 5 725 MHz
4. Please refer to Appendix A for plots

Test results

[DC 5 V]

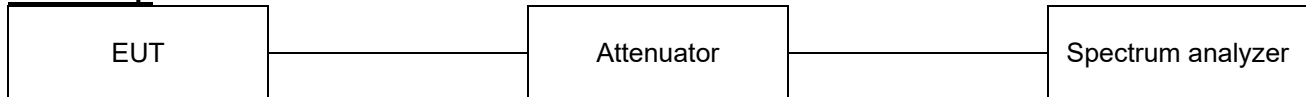
Band	Mode	Frequency (MHz)	Tones	RU offset	6 dB bandwidth (MHz)	99% bandwidth (MHz)
					ANT	ANT
UNII-3	HE20	Straddle 5 720	26T	8	2.20	18.38
			52T	40	17.03	18.08
			106T	54*	4.59	4.59
			242T	61*	4.49	4.49
			SU	-*	4.49	4.49
		5 745	26T	0	2.05	18.18
		5 785	26T	0	2.05	18.23
		5 825	26T	0	2.10	18.23
		Minimum Bandwidth			2.05	4.49
Minimum Limit (MHz)				0.5	-	

[DC 12 V]

Band	Mode	Frequency (MHz)	Tones	RU offset	6 dB bandwidth (MHz)	99% bandwidth (MHz)
					ANT 2	ANT 2
UNII-3	HE20	Straddle 5 720	26T	8	2.20	18.38
			52T	40	15.83	18.08
			106T	54*	4.54	4.59
			242T	61*	4.54	4.44
			SU	-*	4.54	4.44
		5 745	26T	0	2.10	18.18
		5 785	26T	8	2.05	18.18
		5 825	26T	8	2.15	18.23
		Minimum Bandwidth			2.05	4.44
Minimum Limit (MHz)				0.5	-	

7.5. Frequency stability

Test setup



Limit

According to §15.407(g),

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

According to RSS-GEN(6.11),

For licence-exempt devices, the following conditions apply:

- (a) at the temperatures of -20°C (-4°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage
- (b) at the temperature of +20°C (+68°F) and at ±15% of the manufacturer's rated supply voltage

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

If the device contains both licence and licence-exempt transmitter modules, the device's frequency stability shall be measured under the most stringent condition specified in the applicable RSS of the transmitter module.

In addition, if an unmodulated carrier is not available, the method used to measure frequency stability shall be described in the test report.

According to RSS-GEN(8.11),

If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable RSS, the fundamental emissions of the radio apparatus should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation. In addition, its occupied bandwidth shall be entirely outside the restricted bands and the prohibited TV bands of 54-72 MHz, 76-88 MHz, 174-216 MHz, and 470-602 MHz, unless otherwise indicated.

Test procedure

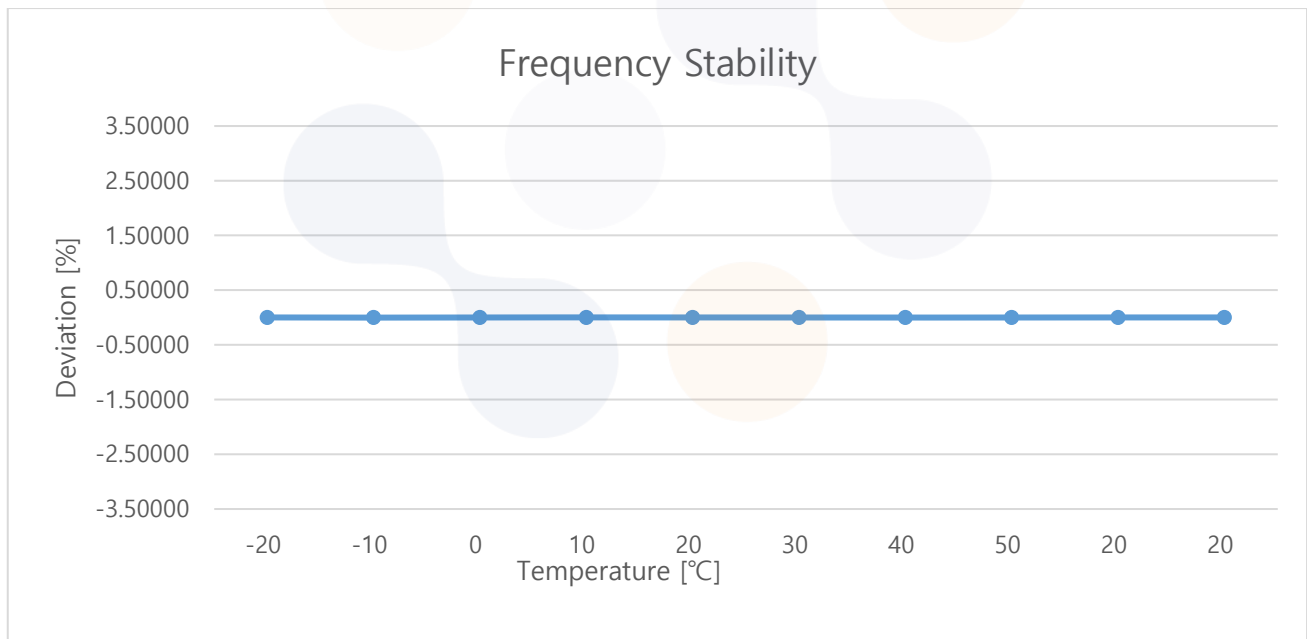
ANSI C63.10-2013 - Section 6.8.1

Test results

[DC 5 V]

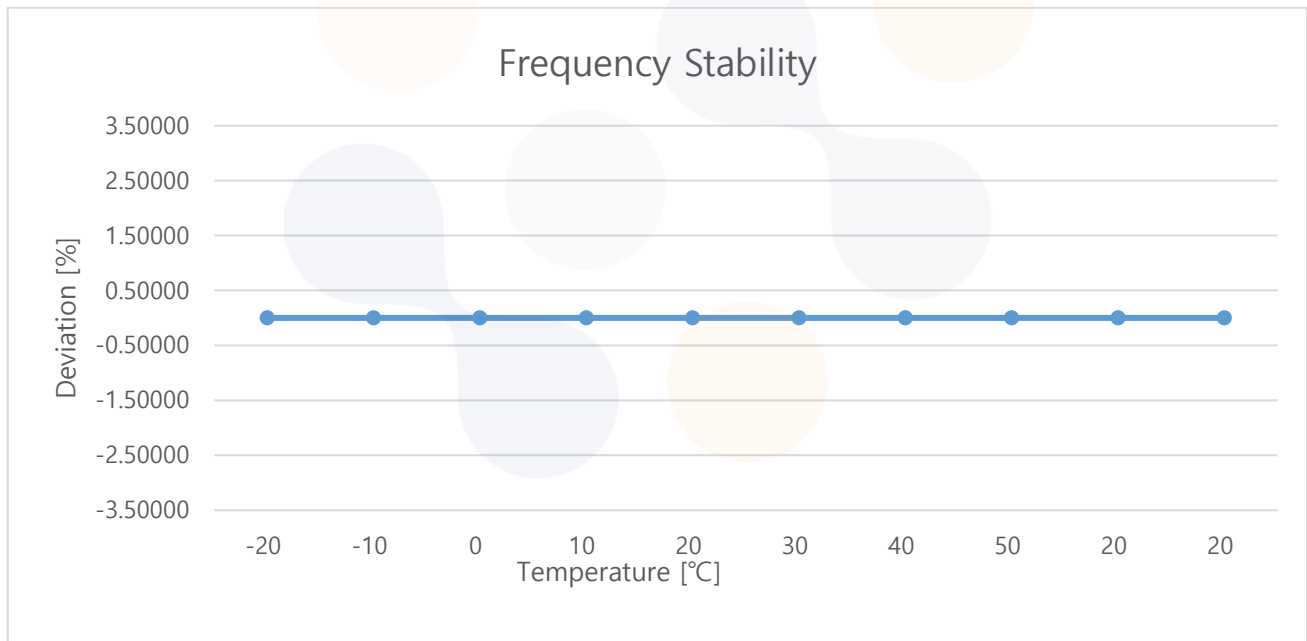
Test band : UNII-1
 Frequency (Hz) : 5 180 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	5.00	-20	5 180 029 170	29 170	5.63	0.000 56
		-10	5 180 029 570	29 570	5.71	0.000 57
		0	5 180 023 580	23 580	4.55	0.000 46
		+10	5 180 014 190	14 190	2.74	0.000 27
		+20	5 180 004 200	4 200	0.81	0.000 08
		+30	5 179 995 000	-5 000	-0.97	-0.000 10
		+40	5 179 990 810	-9 190	-1.77	-0.000 18
		+50	5 179 996 200	-3 800	-0.73	-0.000 07
85%	4.25	+20	5 180 001 600	1 600	0.31	0.000 03
115%	5.75	+20	5 180 001 600	1 600	0.31	0.000 03



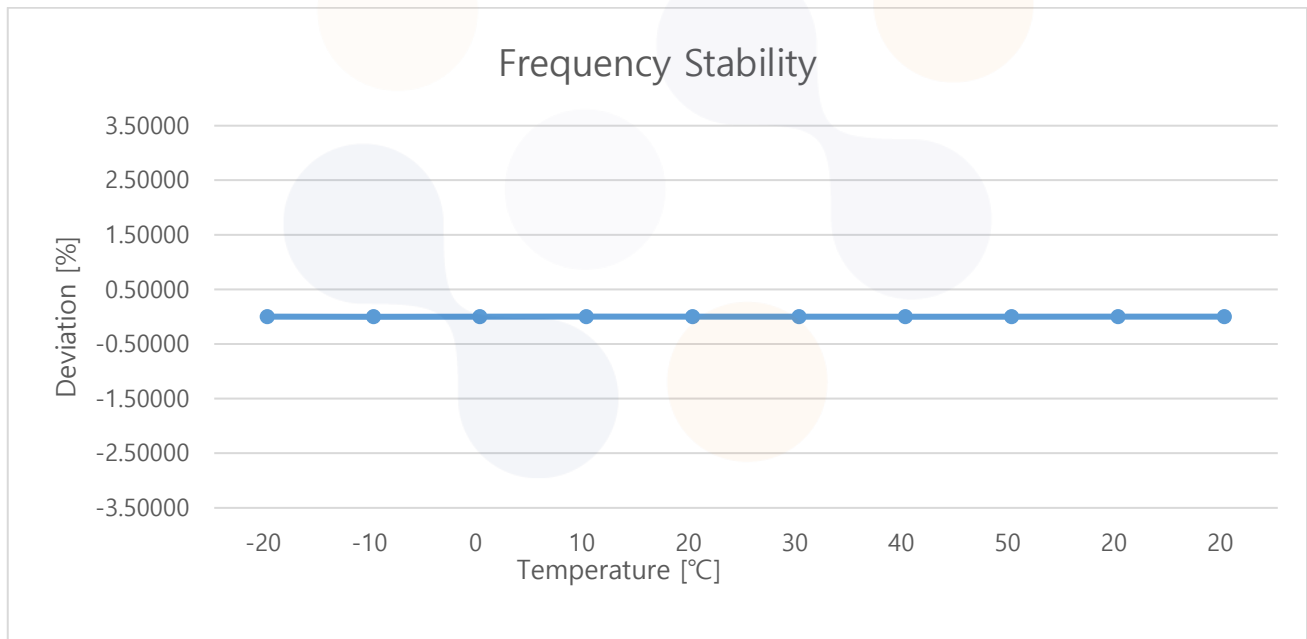
Test band : UNII-2A
 Frequency (Hz) : 5 260 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	5.00	-20	5 260 028 970	28 970	5.51	0.000 55
		-10	5 260 030 570	30 570	5.81	0.000 58
		0	5 260 025 770	25 770	4.90	0.000 49
		+10	5 260 016 180	16 180	3.08	0.000 31
		+20	5 260 005 390	5 390	1.02	0.000 10
		+30	5 259 996 800	-3 200	-0.61	-0.000 06
		+40	5 259 990 610	-9 390	-1.79	-0.000 18
		+50	5 259 994 210	-5 790	-1.10	-0.000 11
85%	4.25	+20	5 260 002 400	2 400	0.46	0.000 05
115%	5.75	+20	5 260 002 000	2 000	0.38	0.000 04



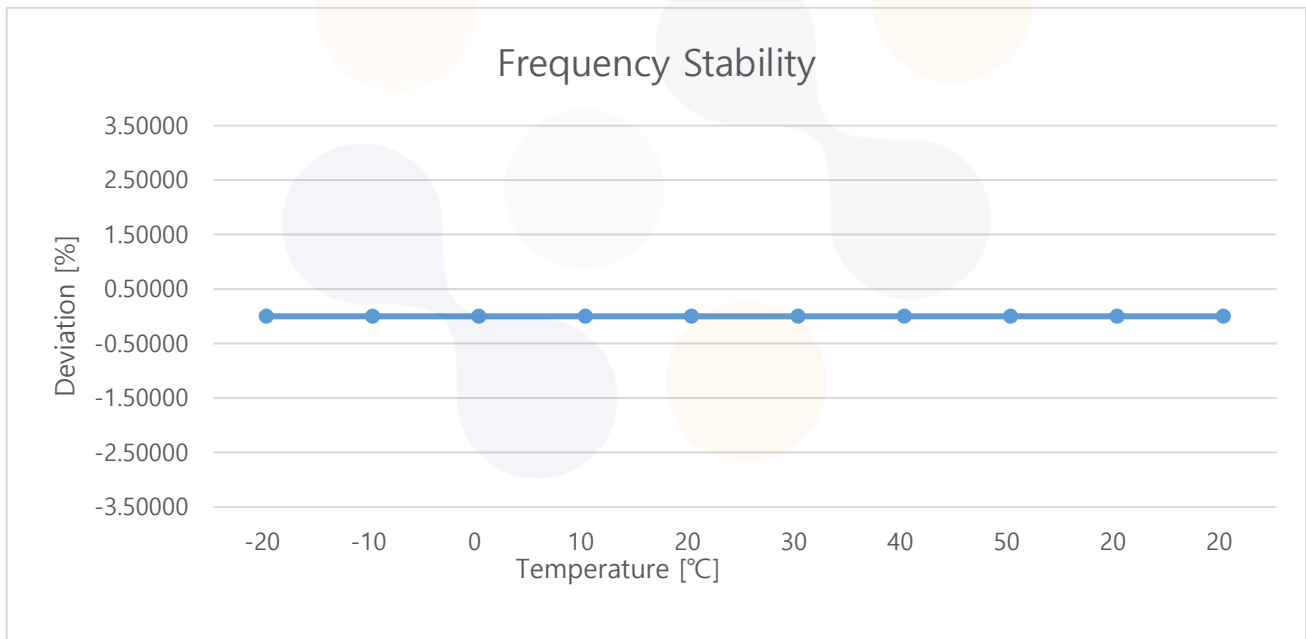
Test band : UNII-2C
 Frequency (Hz) : 5 500 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	5.00	-20	5 500 030 170	30 170	5.49	0.000 55
		-10	5 500 032 170	32 170	5.85	0.000 59
		0	5 500 027 370	27 370	4.98	0.000 50
		+10	5 500 017 980	17 980	3.27	0.000 33
		+20	5 500 006 790	6 790	1.23	0.000 12
		+30	5 499 997 000	-3 000	-0.55	-0.000 06
		+40	5 499 990 410	-9 590	-1.74	-0.000 17
		+50	5 499 993 210	-6 790	-1.23	-0.000 12
85%	4.25	+20	5 500 002 600	2 600	0.47	0.000 05
115%	5.75	+20	5 500 002 200	2 200	0.40	0.000 04



Test band : UNII-3
 Frequency (Hz) : 5 745 000 000

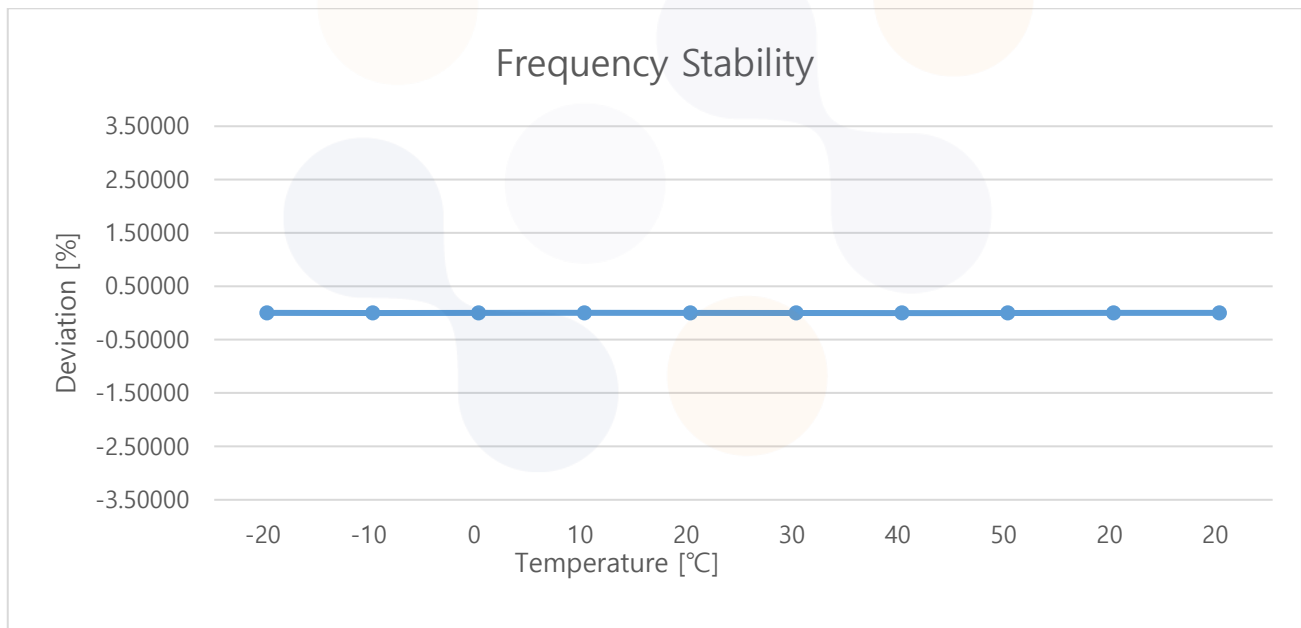
Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	5.00	-20	5 745 030 970	30 970	5.39	0.000 54
		-10	5 745 033 570	33 570	5.84	0.000 58
		0	5 745 028 770	28 770	5.01	0.000 50
		+10	5 745 019 380	19 380	3.37	0.000 34
		+20	5 745 007 790	7 790	1.36	0.000 14
		+30	5 744 997 800	-2 200	-0.38	-0.000 04
		+40	5 744 990 010	-9 990	-1.74	-0.000 17
		+50	5 744 992 210	-7 790	-1.36	-0.000 14
85%	4.25	+20	5 745 002 200	2 200	0.38	0.000 04
115%	5.75	+20	5 745 001 800	1 800	0.31	0.000 03



[DC 12 V]

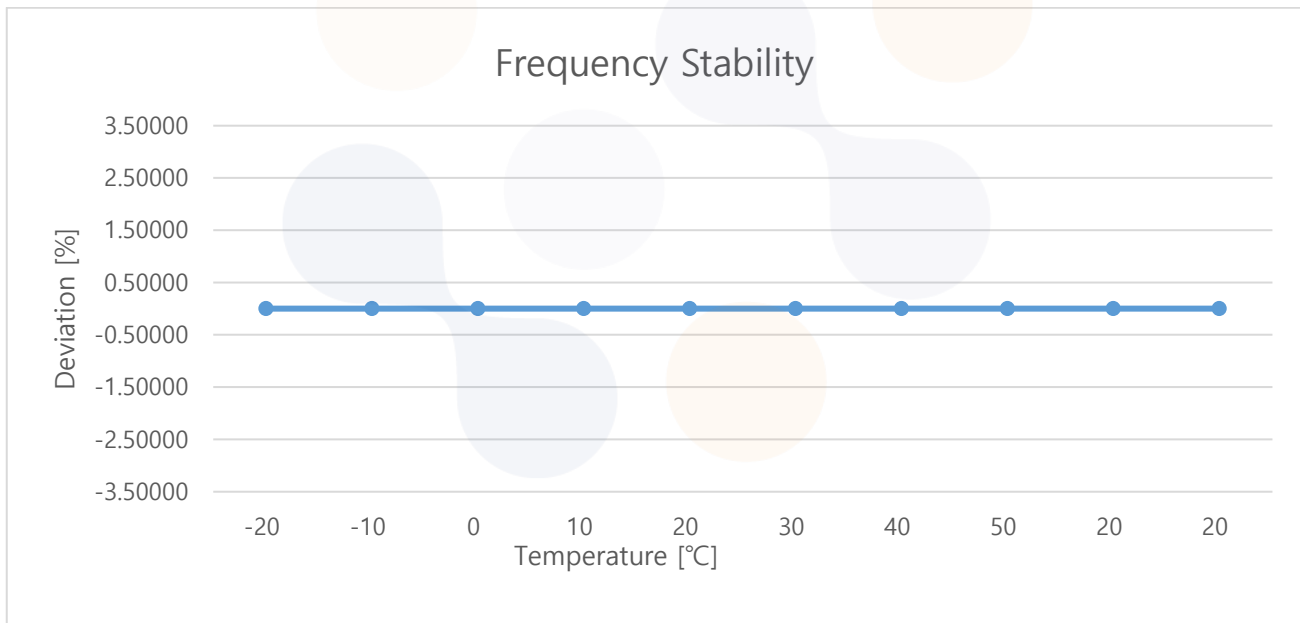
Test band : UNII-1
 Frequency (Hz) : 5 180 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	12.00	-20	5 180 028 970	28 970	5.59	0.000 56
		-10	5 180 029 770	29 770	5.75	0.000 58
		0	5 180 023 580	23 580	4.55	0.000 46
		+10	5 180 014 190	14 190	2.74	0.000 27
		+20	5 180 004 200	4 200	0.81	0.000 08
		+30	5 179 995 000	-5 000	-0.97	-0.000 10
		+40	5 179 990 610	-9 390	-1.81	-0.000 18
		+50	5 179 995 000	-5 000	-0.97	-0.000 10
85%	10.20	+20	5 180 001 600	1 600	0.31	0.000 03
115%	13.80	+20	5 180 001 600	1 600	0.31	0.000 03



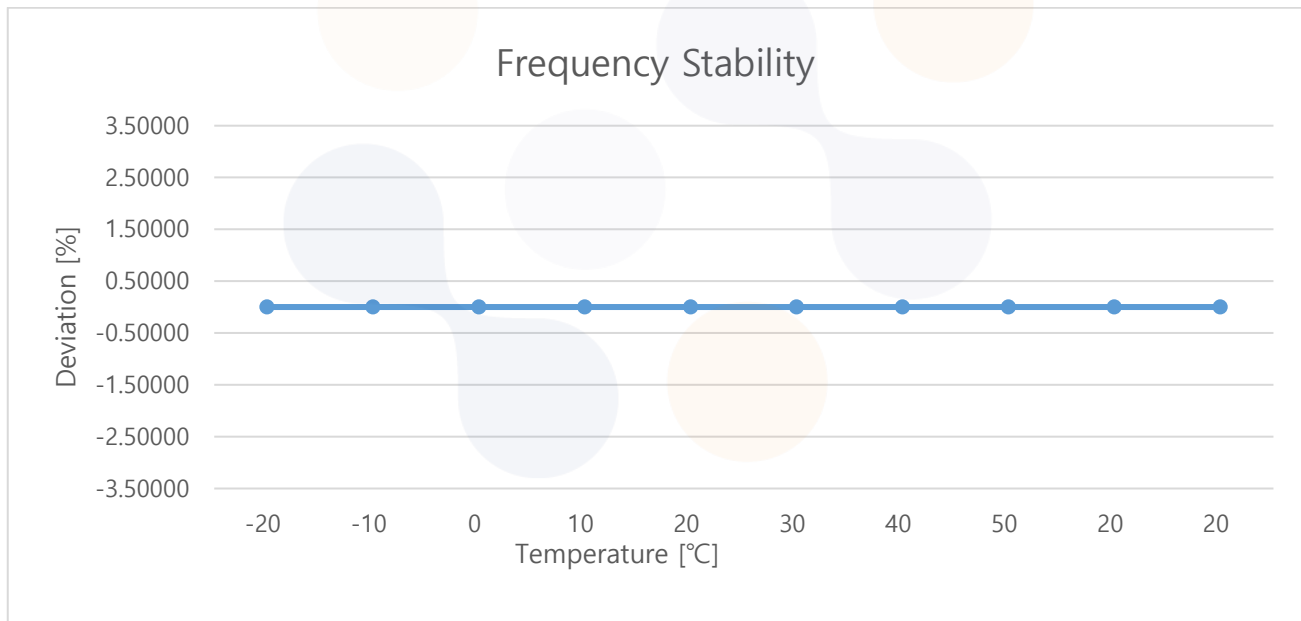
Test band : UNII-2A
 Frequency (Hz) : 5 260 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	12.00	-20	5 260 028 170	28 170	5.36	0.000 54
		-10	5 260 030 570	30 570	5.81	0.000 58
		0	5 260 025 770	25 770	4.90	0.000 49
		+10	5 260 016 380	16 380	3.11	0.000 31
		+20	5 260 006 190	6 190	1.18	0.000 12
		+30	5 259 996 200	-3 800	-0.72	-0.000 07
		+40	5 259 990 610	-9 390	-1.79	-0.000 18
		+50	5 259 993 410	-6 590	-1.25	-0.000 13
85%	10.20	+20	5 260 002 400	2 400	0.46	0.000 05
115%	13.80	+20	5 260 002 000	2 000	0.38	0.000 04



Test band : UNII-2C
 Frequency (Hz) : 5 500 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	12.00	-20	5 500 029 170	29 170	5.30	0.000 53
		-10	5 500 032 170	32 170	5.85	0.000 59
		0	5 500 027 570	27 570	5.01	0.000 50
		+10	5 500 016 980	16 980	3.09	0.000 31
		+20	5 500 007 190	7 190	1.31	0.000 13
		+30	5 499 996 400	-3 600	-0.65	-0.000 07
		+40	5 499 990 410	-9 590	-1.74	-0.000 17
		+50	5 499 992 610	-7 390	-1.34	-0.000 13
85%	10.20	+20	5 500 001 400	1 400	0.25	0.000 03
115%	13.80	+20	5 500 001 200	1 200	0.22	0.000 02



Test band : UNII-3
 Frequency (Hz) : 5 745 000 000

Voltage (%)	Power (V)	Temp. (°C)	Frequency (Hz)	Frequency error (Hz)	Deviation	
					(ppm)	(%)
100%	12.00	-20	5 745 030 570	30 570	5.32	0.000 53
		-10	5 745 033 770	33 770	5.88	0.000 59
		0	5 745 028 970	28 970	5.04	0.000 50
		+10	5 745 019 380	19 380	3.37	0.000 34
		+20	5 745 008 390	8 390	1.46	0.000 15
		+30	5 744 997 000	-3 000	-0.52	-0.000 05
		+40	5 744 989 810	-10 190	-1.77	-0.000 18
		+50	5 744 991 810	-8 190	-1.43	-0.000 14
85%	10.20	+20	5 745 002 000	2 000	0.35	0.000 04
115%	13.80	+20	5 745 001 600	1 600	0.28	0.000 03

