



FCC - TEST REPORT

Report Number : **68.950.20.0157.01** Date of Issue: 2020-04-22

Model : **SPBL1**

Product Type : Camera

Applicant : GoPro, Inc.

Address : 3000 Clearview Way, San Mateo, CA 94402, USA

Manufacturer : GoPro, Inc.

Address : 3000 Clearview Way, San Mateo, CA 94402, USA

Test Result : **Positive** **Negative**

Total pages including Appendices : **56**

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
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FCC Designation Number: CN5009

FCC Registration No.: 514049

ISED#: 10320A

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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: Camera

Model no.: SPBL1

FCC ID: CNFSPBL1

Rating: 3.85VDC

RF Transmission Frequency: 5.180GHz~5.240GHz;
5.260GHz~5.320GHz;
5.500GHz~5.700GHz;
5.745GHz~5.825GHz

Note: until further notice, device subject to this section shall not be capable of transmitting in the band 5600-5650MHz. This restriction is for the protection of Environment Canada's weather radars operating in this band.

Modulation: 802.11a: BPSK, QPSK, 16QAM, 64QAM
802.11n: BPSK, QPSK, 16QAM, 64QAM
802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM

Antenna Type: Integral Metal Antenna

Antenna Gain: -0.2dBi max for 5.180GHz~5.240GHz;
1.4dBi max for 5.260GHz~5.320GHz;
2.5dBi max for 5.500GHz~5.700GHz;
1.7dBi max for 5.745GHz~5.825GHz

Description of the EUT: The Equipment Under Test (EUT) is a Camera supports 2.4GHz Bluetooth/WIFI, 5GHz WIFI functions.

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart E, 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart E - Unlicensed National Information Infrastructure Devices
FCC Part 15 Subpart C 10-1-2018 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Test Method:

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 789033 D02 General UNII Test Procedures New Rules v02r01f

KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices

5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart E, FCC Part 15 Subpart C			
Test Condition	Test Result		
	Pass	Fail	N/A
15.207 Conducted Emission AC Power Port	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(e) Emission bandwidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(a)(i) Maximum Conducted Output Power	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(a)(i) Maximum Power Spectral Density	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(b)(1), 15.407(b)(2), 15.407(b)(3), 15.407(b)(5), 15.407(b)(4), 15.407(b)(6) 15.407(b)(7) 15.209 Unwanted Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(g) Frequencies Stability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.407(h) Dynamic Frequency Selection (DFS).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.203 Antenna Requirement	<input checked="" type="checkbox"/> See note 1	<input type="checkbox"/>	<input type="checkbox"/>

Remark: ^a The EUT can be configured as a master and client. When operating as Clients Device without Radar Detection, it will work on 5180GHz~5.240GHz; 5.260GHz~5.320GHz; 5.500GHz~5.700GHz; 5.745GHz~5.825GHz. When operating as Master Device without Radar Detection, it will work on 5180GHz~5.240GHz, 5.745GHz~5.825GHz.

Note 1: The EUT uses an Integrated antenna, which gain is -0.2dBi max for 5.180GHz~5.240GHz; 1.4dBi max for 5.260GHz~5.320GHz; 2.5dBi max for 5.500GHz~5.700GHz; 1.7dBi max for 5.745GHz~5.825GHz. In accordance to 15.203, it is considered sufficiently to comply with the provisions of this section.



6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: CNFSPBL1, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C

The Model: SPBL1 supports Bluetooth Low Energy/Bluetooth BR+EDR /WIFI/GPS & Galileo receiving functions, power by 3.85Vdc, 1720mAh supplied by an rechargeable Lithium Ion Battery or 5Vdc supplied by USB type C port.

The TX and RX range is 2402MHz-2480MHz for Bluetooth, 2412MHz – 2462MHz for 2.4GHzWIFI, 5180MHz – 5320MHz, 5500MHz – 5700MHz, 5745MHz – 5825MHz for 5GHzWIFI, 1575.42MHz for GNSS (only GPS and Galileo) Receiver.

This report is for the 5GHz WIFI band 1/2/3/4.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: 2020-04-03

Testing Start Date: 2020-04-03

Testing End Date: 2020-04-20

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch –

Reviewed by:

Prepared by:

Tested by:



John Zhi
EMC Project Manager

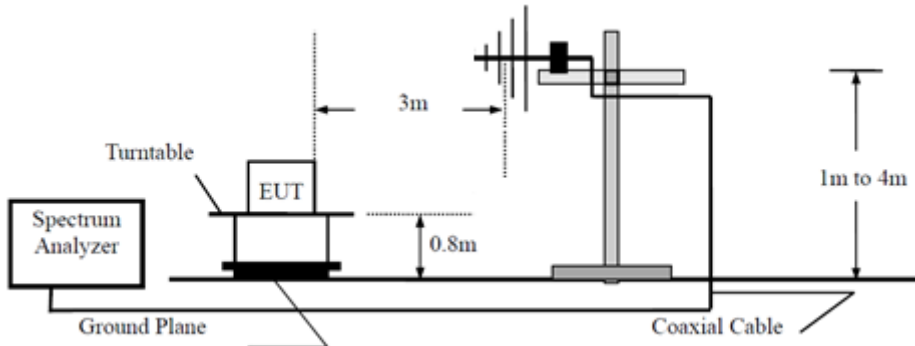
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EMC Test Engineer

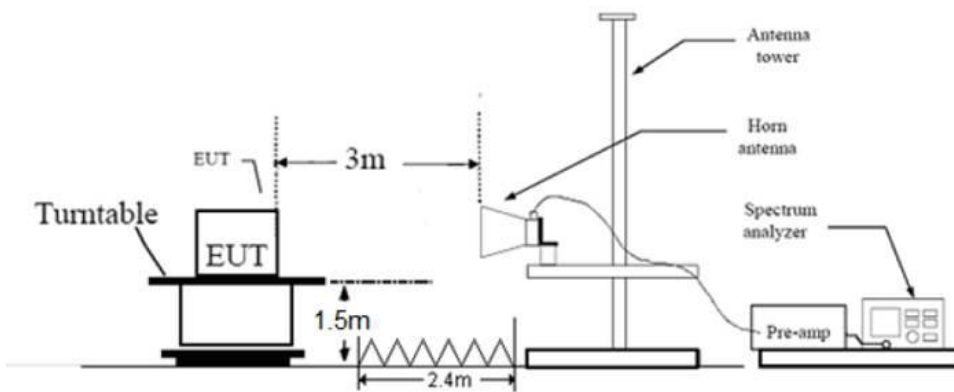
7 Test setups

7.1 Radiated test setups

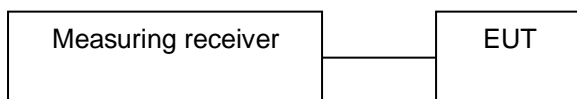
Below 1GHz



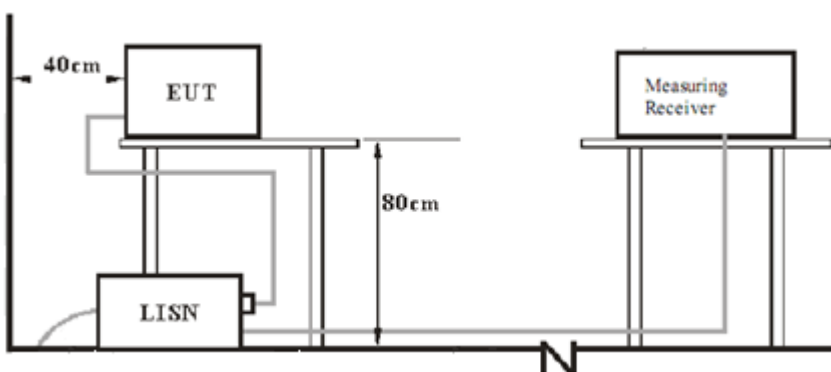
Above 1GHz



7.2 Conducted RF test setups



7.3 AC Power Line Conducted Emission test setups



8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.	S/N
Laptop	Lenovo	T460S	---
USB Type C cable	GoPro	0.46m (Length)	---
AC Adapter	Apple	A1401	---

Test software information:

Test Software Version	QRCT (V3.0-186.0) from QUALCOMM			
Band	Mode	Freq (MHz)	Power level from QRCT	Packet Type
5G WIFI U-NII-1	802.11a	5180	15	11g 6 Mbps
	802.11a	5200	15	11g 6 Mbps
	802.11a	5240	15	11g 6 Mbps
	802.11n HT20	5180	15	MCS0 6.5 Mbps
	802.11n HT20	5200	15	MCS0 6.5 Mbps
	802.11n HT20	5240	15	MCS0 6.5 Mbps
	802.11n HT40	5190	15	MCS0 13.5 Mbps (40MHz)
	802.11n HT40	5230	15	MCS0 13.5 Mbps (40MHz)
	802.11ac VHT20	5180	15	11ac NGI 6.5 Mbps (20MHz)
	802.11ac VHT20	5200	15	11ac NGI 6.5 Mbps (20MHz)
	802.11ac VHT20	5240	15	11ac NGI 6.5 Mbps (20MHz)
	802.11ac VHT40	5190	15	11ac NGI 13.5 Mbps (40MHz)
	802.11ac VHT40	5230	15	11ac NGI 13.5 Mbps (40MHz)
	802.11ac VHT80	5210	14	11ac NGI 29.3 Mbps (80MHz)
5G WIFI U-NII-2A	802.11a	5260	15	11g 6 Mbps
	802.11a	5280	15	11g 6 Mbps
	802.11a	5320	15	11g 6 Mbps
	802.11n HT20	5260	15	MCS0 6.5 Mbps
	802.11n HT20	5280	15	MCS0 6.5 Mbps
	802.11n HT20	5320	15	MCS0 6.5 Mbps
	802.11n HT40	5270	15	MCS0 13.5 Mbps (40MHz)
	802.11n HT40	5310	15	MCS0 13.5 Mbps (40MHz)
	802.11ac VHT20	5260	15	11ac NGI 6.5 Mbps (20MHz)
	802.11ac VHT20	5280	15	11ac NGI 6.5 Mbps (20MHz)
	802.11ac VHT20	5320	15	11ac NGI 6.5 Mbps (20MHz)



	802.11ac VHT40	5270	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT40	5310	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT80	5290	13.5	11ac NGI 29.3 Mbps (80MHz)	
5G WIFI U-NII-2C	802.11a	5500	15	11g 6 Mbps	
	802.11a	5580	15	11g 6 Mbps	
	802.11a	5700	15	11g 6 Mbps	
	802.11a	5720_UNII-2C	15	11g 6 Mbps	
	802.11a	5720_UNII-3	15	11g 6 Mbps	
	802.11n HT20	5500	15	MCS0 6.5 Mbps	
	802.11n HT20	5580	15	MCS0 6.5 Mbps	
	802.11n HT20	5700	15	MCS0 6.5 Mbps	
	802.11n HT20	5720_UNII-2C	15	MCS0 6.5 Mbps	
	802.11n HT20	5720_UNII-3	15	MCS0 6.5 Mbps	
	802.11n HT40	5510	15	MCS0 13.5 Mbps (40MHz)	
	802.11n HT40	5550	15	MCS0 13.5 Mbps (40MHz)	
	802.11n HT40	5670	15	MCS0 13.5 Mbps (40MHz)	
	802.11n HT40	5710_UNII-2C	15	MCS0 13.5 Mbps (40MHz)	
	802.11n HT40	5710_UNII-3	15	MCS0 13.5 Mbps (40MHz)	
	802.11ac VHT20	5500	15	11ac NGI 6.5 Mbps (20MHz)	
	802.11ac VHT20	5580	15	11ac NGI 6.5 Mbps (20MHz)	
	802.11ac VHT20	5700	15	11ac NGI 6.5 Mbps (20MHz)	
	802.11ac VHT20	5720_UNII-2C	15	11ac NGI 6.5 Mbps (20MHz)	
	802.11ac VHT20	5720_UNII-3	15	11ac NGI 6.5 Mbps (20MHz)	
	802.11ac VHT40	5510	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT40	5550	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT40	5670	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT40	5710_UNII-2C	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT40	5710_UNII-3	15	11ac NGI 13.5 Mbps (40MHz)	
	802.11ac VHT80	5530	13.5	11ac NGI 29.3 Mbps (80MHz)	
	802.11ac VHT80	5690_UNII-2C	15	11ac NGI 29.3 Mbps (80MHz)	
	802.11ac VHT80	5690_UNII-3	15	11ac NGI 29.3 Mbps (80MHz)	
	5G WIFI U-NII-3	802.11a	5745	11	11g 6 Mbps
		802.11a	5785	11	11g 6 Mbps
802.11a		5825	11	11g 6 Mbps	
802.11n HT20		5745	11	MCS0 6.5 Mbps	
802.11n HT20		5785	11.5	MCS0 6.5 Mbps	
802.11n HT20		5825	11	MCS0 6.5 Mbps	



802.11n HT40	5755	11	MCS0 13.5 Mbps (40MHz)
802.11n HT40	5795	11	MCS0 13.5 Mbps (40MHz)
802.11ac VHT20	5745	11	11ac NGI 6.5 Mbps (20MHz)
802.11ac VHT20	5785	11	11ac NGI 6.5 Mbps (20MHz)
802.11ac VHT20	5825	11	11ac NGI 6.5 Mbps (20MHz)
802.11ac VHT40	5755	11	11ac NGI 13.5 Mbps (40MHz)
802.11ac VHT40	5795	11.5	11ac NGI 13.5 Mbps (40MHz)
802.11ac VHT80	5775	11.5	11ac NGI 29.3 Mbps (80MHz)

The system was configured to channel:

Test Mode	Channel (MHz)		
802.11a, 802.11n HT20 802.11ac VHT20	5G WIFI-Band 1		
	CH36 (5180MHz)	CH40 (5200MHz)	CH48 (5240MHz)
	5G WIFI-Band 2		
	CH52 (5260MHz)	CH56 (5280MHz)	CH64 (5320MHz)
	5G WIFI-Band 3		
	CH100 (5500MHz)	CH116 (5580MHz)	CH140 (5700MHz)
	CH144 (5720MHz)		
	5G WIFI-Band 4		
CH149 (5745MHz),	CH157(5785MHz)	CH165 (5825MHz)	

Test Mode	Channel (MHz)		
802.11n HT40 802.11ac VHT40	5G WIFI-Band 1		
	CH38(5190MHz)	CH46 (5230MHz)	
	5G WIFI-Band 2		
	CH54(5270MHz)	CH62(5310MHz)	
	5G WIFI-Band 3		
	CH102(5510MHz)	CH110(5550MHz)	CH134(5670MHz)
	CH 142 (5710MHz)		
	5G WIFI-Band 4		
CH151(5755MHz)	CH159(5795MHz)		

Test Mode	Channel (MHz)		
802.11ac VHT80	5G WIFI-Band 1		
	CH42(5210MHz)		
	5G WIFI-Band 2		
	CH58(5290MHz)		
	5G WIFI-Band 3		
	CH106(5530MHz)	CH138(5690MHz)	
	5G WIFI-Band 4		
	CH155(5775MHz)		

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

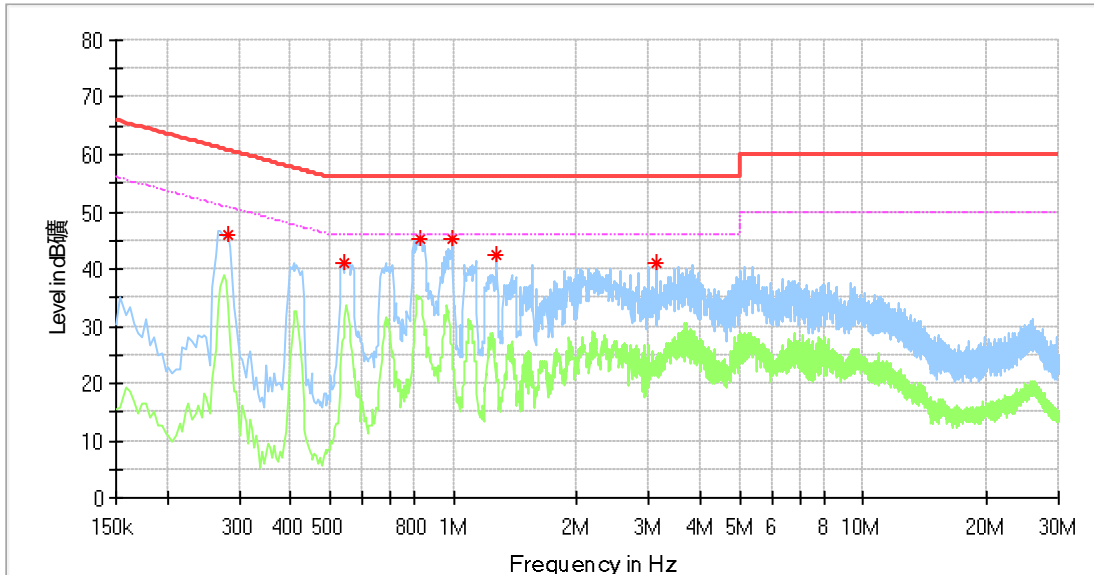
According to §15.207, conducted emissions limit as below:

Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Remark: "*" Decreasing linearly with logarithm of the frequency

Conducted Emission

Product Type : Camera
 M/N : SPBL1
 Operating Condition : Charging + TX
 Test Specification : Power Line, Live
 Comment : AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.282000	45.86	---	60.76	14.89	L1	10.3
0.542000	41.14	---	56.00	14.86	L1	10.3
0.826000	45.10	---	56.00	10.90	L1	10.3
0.994000	45.13	---	56.00	10.87	L1	10.3
1.274000	42.61	---	56.00	13.39	L1	10.3
3.118000	41.23	---	56.00	14.77	L1	10.4

Remark :

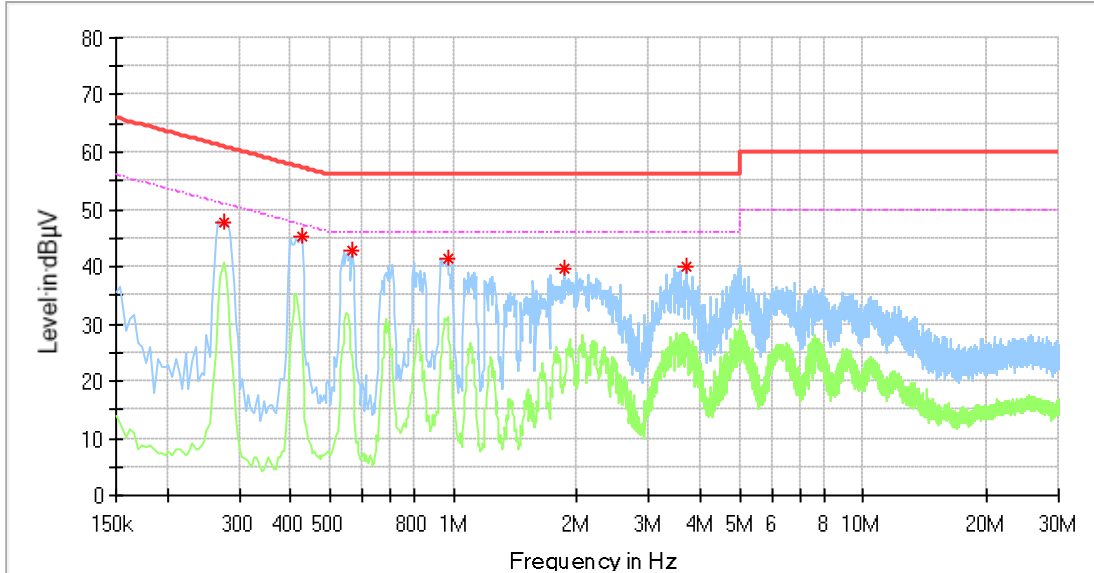
Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

(The Reading Level is recorded by software which is not shown in the sheet)

Conducted Emission

Product Type : Camera
 M/N : SPBL1
 Operating Condition : Charging + TX
 Test Specification : Power Line, Neutral
 Comment : AC 120V/60Hz (External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.274000	47.70	---	61.00	13.30	N	10.3
0.426000	45.14	---	57.33	12.20	N	10.3
0.566000	42.69	---	56.00	13.31	N	10.3
0.970000	41.41	---	56.00	14.59	N	10.3
1.862000	39.50	---	56.00	16.50	N	10.4
3.690000	39.89	---	56.00	16.11	N	10.4

Remark :

Level=Reading Level + Correction Factor

Correction Factor=Cable Loss + LISN Factor

(The Reading Level is recorded by software which is not shown in the sheet)

9.2 Emission bandwidth

The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.

1、 Test Method of 26dB Bandwidth

According to KDB789033 D02

- 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%.

Limit: No limit

2、 Test Method of 6dB Bandwidth

According to KDB789033 D02

- a) Set RBW = 100KHz
- 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.

Limit: ≥ 500 KHz

3、 Test Method of 99% Bandwidth

According to KDB789033 D02

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

Limit: No limit



26dB Bandwidth Test result:

TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.640	5170.240	5189.880	---	PASS
		5200	19.600	5190.520	5210.120	---	PASS
		5240	19.560	5230.400	5249.960	---	PASS
		5260	19.520	5250.240	5269.760	---	PASS
		5280	19.920	5270.120	5290.040	---	PASS
		5320	19.880	5310.200	5330.080	---	PASS
		5500	19.480	5490.160	5509.640	---	PASS
		5580	19.240	5570.600	5589.840	---	PASS
		5700	19.720	5690.320	5710.040	---	PASS
		5720	19.560	5710.320	5729.880	---	PASS
		5720_UNII-2C	14.68	5710.320	5725	---	PASS
		5720_UNII-3	4.88	5725	5729.880	---	PASS
		5745	19.000	5735.600	5754.600	---	PASS
		5785	19.280	5775.400	5794.680	---	PASS
5825	19.120	5815.400	5834.520	---	PASS		
11N20SISO	Ant1	5180	20.040	5170.000	5190.040	---	PASS
		5200	19.800	5190.200	5210.000	---	PASS
		5240	19.920	5230.080	5250.000	---	PASS
		5260	19.960	5250.000	5269.960	---	PASS
		5280	19.920	5270.120	5290.040	---	PASS
		5320	20.000	5310.000	5330.000	---	PASS
		5500	19.840	5490.160	5510.000	---	PASS
		5580	20.000	5570.040	5590.040	---	PASS
		5700	20.440	5690.080	5710.520	---	PASS
		5720	20.000	5710.120	5730.120	---	PASS
		5720_UNII-2C	14.88	5710.120	5725	---	PASS
		5720_UNII-3	5.12	5725	5730.120	---	PASS
		5745	19.880	5735.120	5755.000	---	PASS
		5785	19.800	5775.120	5794.920	---	PASS
5825	19.840	5815.080	5834.920	---	PASS		
11N40SISO	Ant1	5190	45.120	5167.120	5212.240	---	PASS
		5230	45.600	5207.200	5252.800	---	PASS
		5270	45.440	5247.280	5292.720	---	PASS
		5310	45.120	5287.920	5333.040	---	PASS
		5510	46.880	5486.560	5533.440	---	PASS
		5550	45.680	5526.960	5572.640	---	PASS
		5670	44.800	5648.080	5692.880	---	PASS
		5710	45.840	5686.960	5732.800	---	PASS
		5710_UNII-2C	38.04	5686.960	5725	---	PASS
		5710_UNII-3	7.8	5725	5732.800	---	PASS
		5755	44.800	5732.920	5777.720	---	PASS
5795	44.880	5772.440	5817.320	---	PASS		
11AC20SISO	Ant1	5180	19.960	5170.040	5190.000	---	PASS
		5200	20.120	5190.000	5210.120	---	PASS
		5240	19.880	5230.080	5249.960	---	PASS
		5260	19.760	5250.240	5270.000	---	PASS
		5280	20.000	5270.000	5290.000	---	PASS
		5320	19.960	5310.000	5329.960	---	PASS
		5500	20.120	5490.040	5510.160	---	PASS
		5580	19.760	5570.160	5589.920	---	PASS
		5700	20.000	5690.120	5710.120	---	PASS
		5720	19.840	5710.120	5729.960	---	PASS
		5720_UNII-2C	14.88	5710.120	5725	---	PASS
		5720_UNII-3	4.96	5725	5729.960	---	PASS
		5745	19.840	5735.160	5755.000	---	PASS
		5785	19.960	5775.080	5795.040	---	PASS
5825	19.800	5815.160	5834.960	---	PASS		



11AC40SISO	Ant1	5190	44.880	5167.200	5212.080	---	PASS
		5230	46.000	5207.360	5253.360	---	PASS
		5270	41.520	5249.200	5290.720	---	PASS
		5310	43.360	5288.800	5332.160	---	PASS
		5510	42.320	5489.040	5531.360	---	PASS
		5550	46.080	5527.120	5573.200	---	PASS
		5670	41.520	5649.440	5690.960	---	PASS
		5710	46.080	5686.720	5732.800	---	PASS
		5710_UNII-2C	38.28	5686.720	5725	---	PASS
		5710_UNII-3	7.8	5725	5732.800	---	PASS
		5755	41.600	5734.120	5775.720	---	PASS
		5795	40.640	5774.680	5815.320	---	PASS
		11AC80SISO	Ant1	5210	84.000	5167.600	5251.600
5290	86.560			5245.040	5331.600	---	PASS
5530	85.920			5487.120	5573.040	---	PASS
5690	83.680			5648.240	5731.920	---	PASS
5690_UNII-2C	76.76			5648.240	5725	---	PASS
5690_UNII-3	6.92			5725	5731.920	---	PASS
5775	83.520			5733.080	5816.600	---	PASS



99% Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	16.583	5171.768	5188.352	---	PASS
		5200	16.543	5191.808	5208.352	---	PASS
		5240	16.583	5231.768	5248.352	---	PASS
		5260	16.583	5251.768	5268.352	---	PASS
		5280	16.583	5271.768	5288.352	---	PASS
		5320	16.583	5311.768	5328.352	---	PASS
		5500	16.623	5491.768	5508.392	---	PASS
		5580	16.623	5571.768	5588.392	---	PASS
		5700	16.583	5691.768	5708.352	---	PASS
		5720	16.623	5711.768	5728.392	---	PASS
		5720_UNII-2C	13.232	5711.768	5725	---	PASS
		5720_UNII-3	3.392	5725	5728.392	---	PASS
		5745	16.583	5736.768	5753.352	---	PASS
		5785	16.583	5776.768	5793.352	---	PASS
5825	16.583	5816.768	5833.352	---	PASS		
11N20SISO	Ant1	5180	17.622	5171.249	5188.871	---	PASS
		5200	17.662	5191.249	5208.911	---	PASS
		5240	17.622	5231.249	5248.871	---	PASS
		5260	17.662	5251.249	5268.911	---	PASS
		5280	17.662	5271.249	5288.911	---	PASS
		5320	17.702	5311.209	5328.911	---	PASS
		5500	17.622	5491.249	5508.871	---	PASS
		5580	17.622	5571.249	5588.871	---	PASS
		5700	17.622	5691.249	5708.871	---	PASS
		5720	17.662	5711.209	5728.871	---	PASS
		5720_UNII-2C	13.791	5711.209	5725	---	PASS
		5720_UNII-3	3.871	5725	5728.871	---	PASS
		5745	17.622	5736.249	5753.871	---	PASS
		5785	17.622	5776.249	5793.871	---	PASS
5825	17.662	5816.249	5833.911	---	PASS		
11N40SISO	Ant1	5190	36.284	5171.938	5208.222	---	PASS
		5230	36.204	5212.018	5248.222	---	PASS
		5270	36.284	5251.938	5288.222	---	PASS
		5310	36.044	5292.018	5328.062	---	PASS
		5510	36.204	5491.938	5528.142	---	PASS
		5550	36.364	5531.858	5568.222	---	PASS
		5670	36.364	5651.858	5688.222	---	PASS
		5710	36.284	5691.858	5728.142	---	PASS
		5710_UNII-2C	33.142	5691.858	5725	---	PASS
		5710_UNII-3	3.142	5725	5728.142	---	PASS
		5755	36.124	5737.018	5773.142	---	PASS
5795	36.364	5776.858	5813.222	---	PASS		
11AC20SISO	Ant1	5180	17.662	5171.249	5188.911	---	PASS
		5200	17.662	5191.249	5208.911	---	PASS
		5240	17.622	5231.249	5248.871	---	PASS
		5260	17.622	5251.249	5268.871	---	PASS
		5280	17.622	5271.249	5288.871	---	PASS
		5320	17.622	5311.249	5328.871	---	PASS
		5500	17.662	5491.249	5508.911	---	PASS
		5580	17.622	5571.249	5588.871	---	PASS
		5700	17.622	5691.249	5708.871	---	PASS
		5720	17.622	5711.249	5728.871	---	PASS
		5720_UNII-2C	13.751	5711.249	5725	---	PASS
		5720_UNII-3	3.871	5725	5728.871	---	PASS
		5745	17.622	5736.249	5753.871	---	PASS
		5785	17.622	5776.249	5793.871	---	PASS
5825	17.662	5816.249	5833.911	---	PASS		
11AC40SISO	Ant1	5190	36.284	5171.938	5208.222	---	PASS



		5230	36.284	5211.938	5248.222	---	PASS
		5270	36.204	5251.938	5288.142	---	PASS
		5310	36.204	5291.938	5328.142	---	PASS
		5510	36.204	5491.938	5528.142	---	PASS
		5550	36.284	5531.858	5568.142	---	PASS
		5670	36.124	5652.018	5688.142	---	PASS
		5710	36.364	5691.858	5728.222	---	PASS
		5710_UNII-2C	33.142	5691.858	5725	---	PASS
		5710_UNII-3	3.222	5725	5728.222	---	PASS
		5755	36.124	5737.018	5773.142	---	PASS
5795	36.204	5776.938	5813.142	---	PASS		
11AC80SISO	Ant1	5210	75.285	5172.438	5247.722	---	PASS
		5290	75.445	5252.278	5327.722	---	PASS
		5530	75.285	5492.278	5567.562	---	PASS
		5690	75.285	5652.278	5727.562	---	PASS
		5690_UNII-2C	72.722	5652.278	5725	---	PASS
		5690_UNII-3	2.562	5725	5727.562	---	PASS
		5775	75.125	5737.438	5812.562	---	PASS



6dB Bandwidth Test Result

TestMode	Antenna	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.240	5737.440	5752.680	0.5	PASS
		5785	15.200	5777.480	5792.680	0.5	PASS
		5825	15.240	5817.440	5832.680	0.5	PASS
11N20SISO	Ant1	5745	15.240	5737.440	5752.680	0.5	PASS
		5785	15.240	5777.440	5792.680	0.5	PASS
		5825	15.240	5817.440	5832.680	0.5	PASS
11N40SISO	Ant1	5755	35.200	5737.480	5772.680	0.5	PASS
		5795	35.200	5777.480	5812.680	0.5	PASS
11AC20SISO	Ant1	5745	15.200	5737.440	5752.640	0.5	PASS
		5785	15.240	5777.440	5792.680	0.5	PASS
		5825	15.200	5817.440	5832.640	0.5	PASS
11AC40SISO	Ant1	5755	35.280	5737.400	5772.680	0.5	PASS
		5795	35.200	5777.480	5812.680	0.5	PASS
11AC80SISO	Ant1	5775	75.360	5737.400	5812.760	0.5	PASS

9.3 Maximum conducted output power

Test Method

According to KDB789033 D02(E) Method 3, the EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.

Limits:

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

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 26dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Note:

Maximum Conducted Output Power = Conducted Output Power + Correction Factor

Test result as below table

IEEE 802.11a modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	14.80	24.00
	Middle	5200	14.79	24.00
	High	5240	14.86	24.00
5.2G Band	Low	5260	15.06	24.00
	Middle	5280	15.51	24.00
	High	5320	15.37	24.00
5.5G Band	Low	5500	15.54	24.00
	Middle	5580	15.43	24.00
	High	5700	15.02	24.00
	High	5720	14.99	24.00
5.8G Band	Low	5745	11.80	30.00
	Middle	5785	10.95	30.00
	High	5825	11.42	30.00

IEEE 802.11n HT20 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	14.67	24.00
	Middle	5200	14.60	24.00
	High	5240	14.64	24.00
5.2G Band	Low	5260	14.93	24.00
	Middle	5280	15.37	24.00
	High	5320	15.24	24.00
5.5G Band	Low	5500	15.57	24.00
	Middle	5580	15.38	24.00
	High	5700	14.92	24.00
	High	5720	14.99	24.00
5.8G Band	Low	5745	11.60	30.00
	Middle	5785	11.16	30.00
	High	5825	11.07	30.00



IEEE 802.11n HT40 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5190	14.44	24.00
	High	5230	14.46	24.00
5.2G Band	Low	5270	14.75	24.00
	High	5310	15.14	24.00
5.5G Band	Low	5510	15.22	24.00
	Middle	5550	15.12	24.00
	High	5670	14.92	24.00
	High	5710	14.61	24.00
5.8G Band	Low	5755	11.45	30.00
	High	5795	10.48	30.00

IEEE 802.11ac VHT20 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	14.54	24.00
	Middle	5200	14.51	24.00
	High	5240	14.64	24.00
5.2G Band	Low	5260	14.89	24.00
	Middle	5280	15.37	24.00
	High	5320	15.10	24.00
5.5G Band	Low	5500	15.51	24.00
	Middle	5580	15.31	24.00
	High	5700	14.93	24.00
	High	5720	14.77	24.00
5.8G Band	Low	5745	11.64	30.00
	Middle	5785	10.82	30.00
	High	5825	11.03	30.00



IEEE 802.11ac VHT40 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5190	14.39	24.00
	High	5230	14.43	24.00
5.2G Band	Low	5270	14.79	24.00
	High	5310	15.06	24.00
5.5G Band	Low	5510	15.24	24.00
	Middle	5550	15.03	24.00
	High	5670	14.89	24.00
	High	5710	14.48	24.00
5.8G Band	Low	5755	11.40	30.00
	High	5795	11.39	30.00

IEEE 802.11ac VHT80 modulation Test Result

Band	Channel	Frequency (MHz)	Average Power (dBm)	Power Limit (dBm)
5.2G Band	Low	5210	14.31	24.00
5.2G Band	High	5290	14.46	24.00
5.5G Band	Low	5530	14.89	24.00
	High	5690	15.06	24.00
5.8G Band	High	5775	11.79	30.00

9.4 Maximum power spectral density

Test Method

According to KDB789033 D02

The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.

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 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 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 sections 5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.

Limit:

The maximum power spectral density shall not exceed 11dBm for the 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725 GHz Band and 30dBm for the 5.8GHz Band in any 1 megahertz band.



Test Result

TestMode	Antenna	Channel (MHz)	Conducted Result(dBm/MHz)	Conducted Limit(dBm/MHz)	Verdict
11A	Ant1	5180	3.74	<=11	PASS
		5200	3.55	<=11	PASS
		5240	3.96	<=11	PASS
		5260	3.78	<=11	PASS
		5280	4.44	<=11	PASS
		5320	4.25	<=11	PASS
		5500	4.27	<=11	PASS
		5580	4.23	<=11	PASS
		5700	4.15	<=11	PASS
		5720_U NII-2C	3.64	<=11	PASS
		5720_U NII-3	-0.01	<=11	PASS
		5745	-2.02	<=30	PASS
		5785	-2.3	<=30	PASS
		5825	-2.67	<=30	PASS
11N20SIS O	Ant1	5180	4.17	<=11	PASS
		5200	3.5	<=11	PASS
		5240	4.15	<=11	PASS
		5260	3.95	<=11	PASS
		5280	4.91	<=11	PASS
		5320	4.62	<=11	PASS
		5500	4.51	<=11	PASS
		5580	4.52	<=11	PASS
		5700	4.48	<=11	PASS
		5720_U NII-2C	3.81	<=11	PASS
		5720_U NII-3	0.45	<=11	PASS
		5745	-1.64	<=30	PASS
		5785	-1.12	<=30	PASS
		5825	-2	<=30	PASS
11N40SIS O	Ant1	5190	0.03	<=11	PASS
		5230	0.42	<=11	PASS
		5270	0.28	<=11	PASS
		5310	1.16	<=11	PASS
		5510	0.76	<=11	PASS
		5550	0.93	<=11	PASS
		5670	0.38	<=11	PASS
		5710_U NII-2C	0.59	<=11	PASS
		5710_U NII-3	-3.74	<=11	PASS
		5755	-5.14	<=30	PASS
5795	-5.93	<=30	PASS		
11AC20SI SO	Ant1	5180	3.68	<=11	PASS
		5200	3.48	<=11	PASS
		5240	4.09	<=11	PASS
		5260	3.93	<=11	PASS
		5280	4.53	<=11	PASS
		5320	4.2	<=11	PASS
		5500	4.35	<=11	PASS
		5580	4.38	<=11	PASS
		5700	4.29	<=11	PASS
		5720_U NII-2C	3.76	<=11	PASS
		5720_U NII-3	0.22	<=11	PASS
		5745	-1.81	<=30	PASS
		5785	-2.23	<=30	PASS



		5825	-2.69	<=30	PASS		
11AC40SI SO	Ant1	5190	-0.13	<=11	PASS		
		5230	0.24	<=11	PASS		
		5270	0.19	<=11	PASS		
		5310	0.67	<=11	PASS		
		5510	0.29	<=11	PASS		
		5550	0.37	<=11	PASS		
		5670	0.15	<=11	PASS		
		5710_U NII-2C	0.51	<=11	PASS		
		5710_U NII-3	-3.96	<=11	PASS		
		5755	-5.32	<=30	PASS		
		5795	-5.88	<=30	PASS		
		11AC80SI SO	Ant1	5210	-2.17	<=11	PASS
				5290	-2.74	<=11	PASS
5530	-2.46			<=11	PASS		
5690_U NII-2C	-1.42			<=11	PASS		
5690_U NII-3	-8.09			<=11	PASS		
5775	-6.16			<=30	PASS		

9.5 Unwanted emissions

Transmitting spurious emission test result as below (Radiated Mode):

Test Method

1. The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned
5. Use the following spectrum analyzer settings According to C63.10:
 For Above 1GHz
 Span = wide enough to capture the peak level of the in-band emission and all spurious
 RBW = 1MHz, VBW \geq RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
 For Below 1GHz
 Use the following spectrum analyzer settings:
 Span = wide enough to capture the peak level of the in-band emission and all spurious
 RBW = 100 KHz, VBW \geq RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

Limit

According to part 15.407b (6), the radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

According to part 15.407b (1) (2) (3) (4)

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.

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.

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.

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

Note: According to KDB 789033 D02 (G): $E[dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ meters.

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

The only worse case (802.11ac80 modulation) test result is listed in the report.

Transmitting spurious emission test result as below:

802.11ac80 Modulation 5210MHz Test Result

Frequency Range	Frequency	Emission Level	Polarization	Limit	Margin	Detector	Correct factor	Result
MHz	MHz	dBuV/m		dBuV/m	dB		(dB/m)	
30-1000	766.22	31.34	Horizontal	46.00	14.66	QP	28	Pass
30-1000	932.11	30.21	Vertical	46.00	15.79	QP	29	Pass
1000-40000	4819.50*	47.32	Horizontal	74.00	26.68	PK	2.2	Pass
1000-40000	4186.00*	45.91	Vertical	74.00	28.09	PK	1.1	Pass

802.11ac80 Modulation 5290MHz Test Result

Frequency Range	Frequency	Emission Level	Polarization	Limit	Margin	Detector	Correct factor	Result
MHz	MHz	dBuV/m		dBuV/m	dB		(dB/m)	
30-1000	--	--	Horizontal	--	--	QP		Pass
30-1000	--	--	Vertical	--	--	QP		Pass
1000-40000	4275.50*	47.01	Horizontal	74.00	26.99	PK	1.2	Pass
1000-40000	11814.50*	46.98	Vertical	74.00	27.02	PK	9.2	Pass

802.11ac80 Modulation 5530MHz Test Result

Frequency Range	Frequency	Emission Level	Polarization	Limit	Margin	Detector	Correct factor	Result
MHz	MHz	dBuV/m		dBuV/m	dB		(dB/m)	
30-1000	--	--	Horizontal	--	--	QP		Pass
30-1000	--	--	Vertical	--	--	QP		Pass
1000-40000	4514.00*	46.32	Horizontal	74.00	27.68	PK	2.2	Pass
1000-40000	4066.00*	46.32	Vertical	74.00	27.68	PK	0.6	Pass

802.11ac80 Modulation 5690MHz Test Result

Frequency Range	Frequency	Emission Level	Polarization	Limit	Margin	Detector	Correct factor	Result
MHz	MHz	dBuV/m		dBuV/m	dB		(dB/m)	
30-1000	--	--	Horizontal	--	--	QP		Pass
30-1000	--	--	Vertical	--	--	QP		Pass
1000-40000	16072.50*	48.87	Horizontal	74.00	25.13	PK	14.1	Pass
1000-40000	14471.00*	48.67	Vertical	74.00	25.33	PK	10.9	Pass

802.11ac80 Modulation 5775MHz Test Result

Frequency Range	Frequency	Emission Level	Polarization	Limit	Margin	Detector	Correct factor	Result
MHz	MHz	dBuV/m		dBuV/m	dB		(dB/m)	
30-1000	--	--	Horizontal	--	--	QP		Pass
30-1000	--	--	Vertical	--	--	QP		Pass
1000-40000	11938.00*	45.77	Horizontal	74.00	28.23	PK	9.8	Pass
1000-40000	15813.50*	47.85	Vertical	74.00	26.15	PK	13.9	Pass

Remark:

- (1) Corrected Amplitude = Read level + Corrector factor
Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

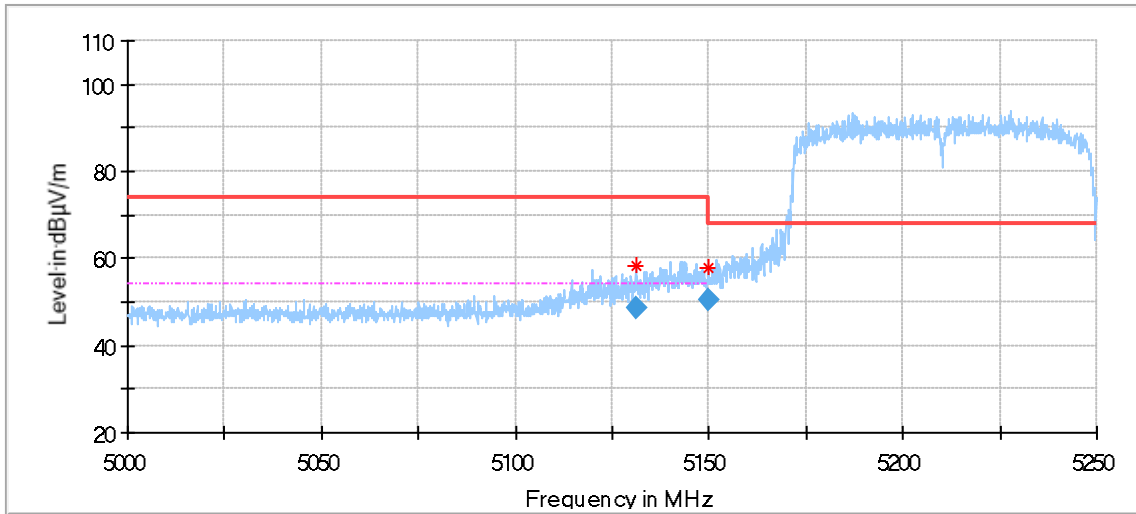
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss.

(The Reading Level is recorded by software which is not shown in the sheet)

- (2) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.
- (3) We test all modes and only the worst case recorded in the report.
- (4) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are the noise floor or attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

Restricted bands of operation. test result as below:

802.11ac80 Modulation 5210MHz



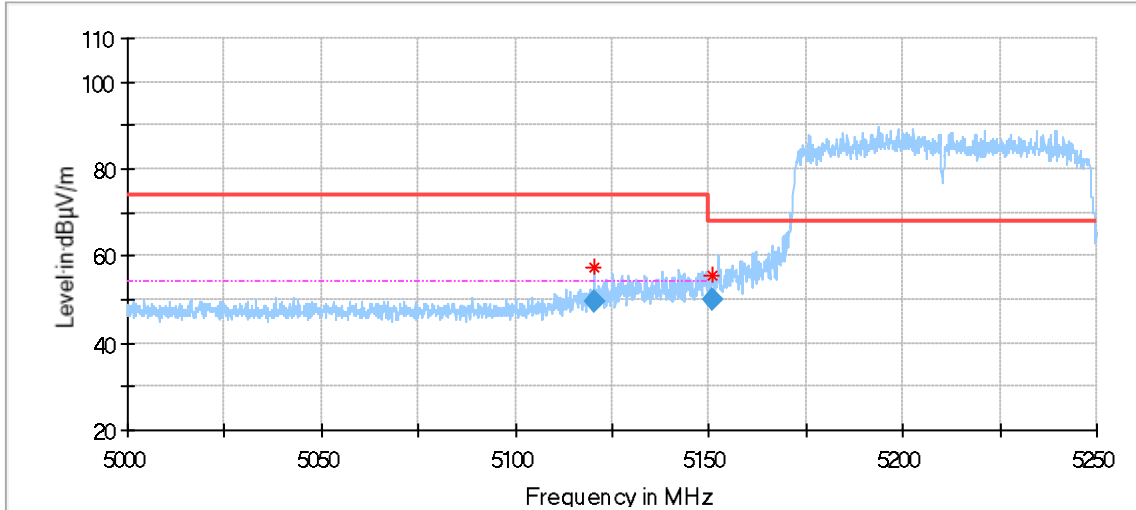
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5131.000000	58.40	74.00	15.60	150.0	H	69.0	1.4
5150.000000	57.97	68.20	10.23	150.0	H	101.0	1.8
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5131.000000	48.62	54.00	5.38	150.0	H	300.0	1.8
5150.000000	50.31	54.00	3.69	150.0	H	101.0	1.8

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5120.412500	57.21	74.00	16.79	150.0	V	187.0	1.4
5150.775000	55.74	68.20	12.46	150.0	V	207.0	1.8
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5120.412500	49.45	54.00	4.55	150.0	V	187.0	1.4
5150.775000	49.89	54.00	4.11	150.0	V	207.0	1.8

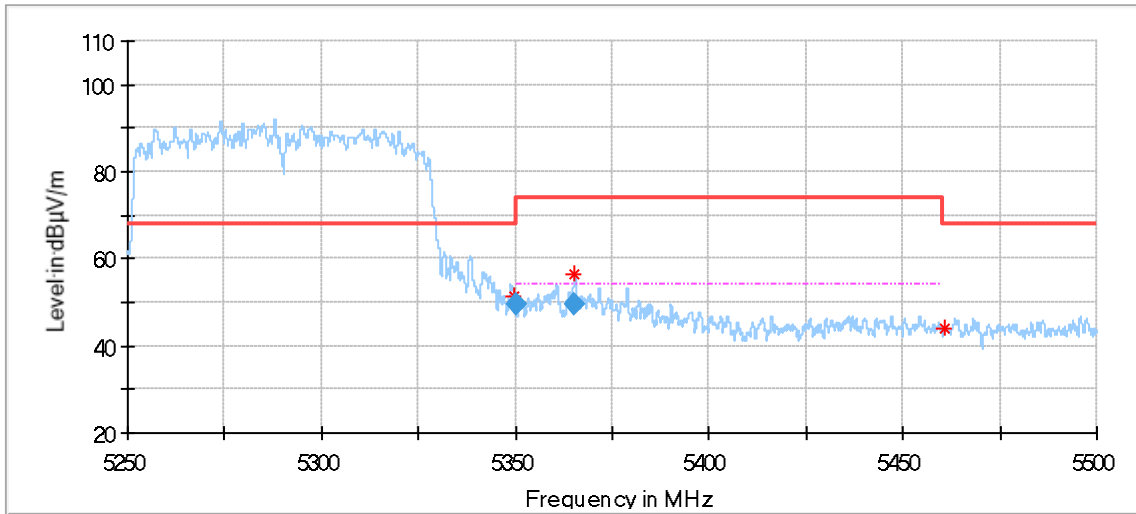
Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

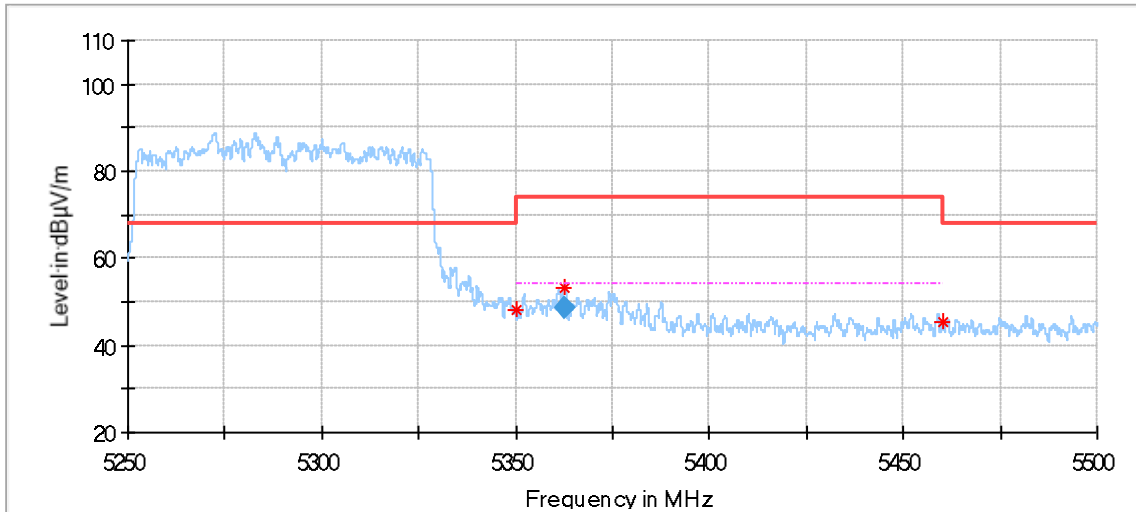
(The Reading Level is recorded by software which is not shown in the sheet)

802.11ac80 Modulation 5290MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5350.000000	51.41	68.20	16.79	150.0	H	89.0	2.0
5365.291667	56.30	74.00	17.70	150.0	H	82.0	2.3
5460.000000	44.07	68.20	24.13	150.0	H	31.0	2.8
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5350.000000	49.38	54.00	4.62	150.0	H	89.0	2.0
5365.291667	49.67	54.00	4.33	150.0	H	82.0	2.3

Remark:
 Level=Reading Level + Correction Factor
 Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier
 (The Reading Level is recorded by software which is not shown in the sheet)



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5350.000000	48.16	68.20	20.04	150.0	V	112.0	2.1
5362.791667	53.45	74.00	20.55	150.0	V	98.0	2.3
5460.000000	45.31	68.20	22.89	150.0	V	315.0	2.9
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5362.791667	48.77	54.00	5.23	150.0	V	98.0	2.3

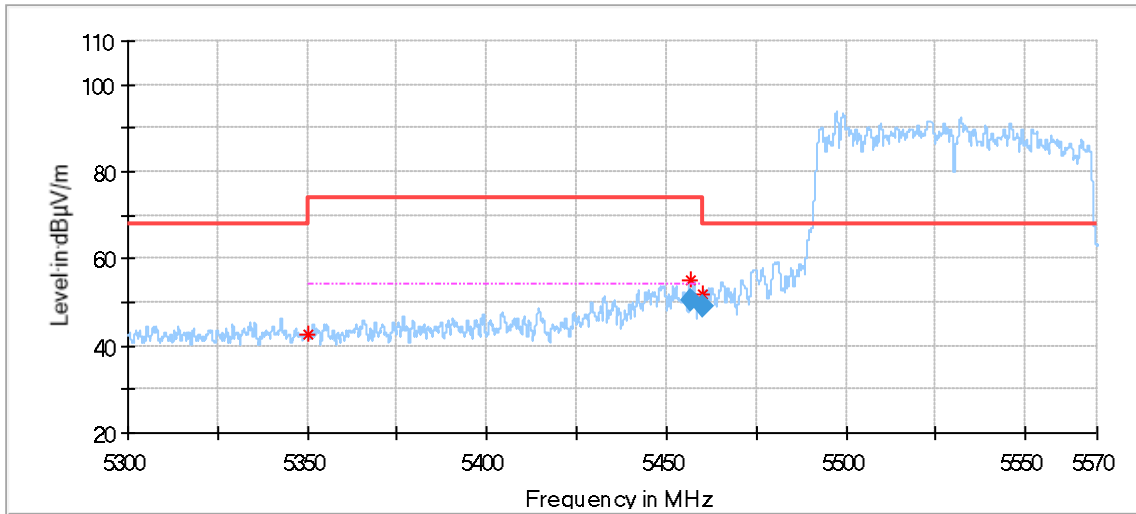
Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

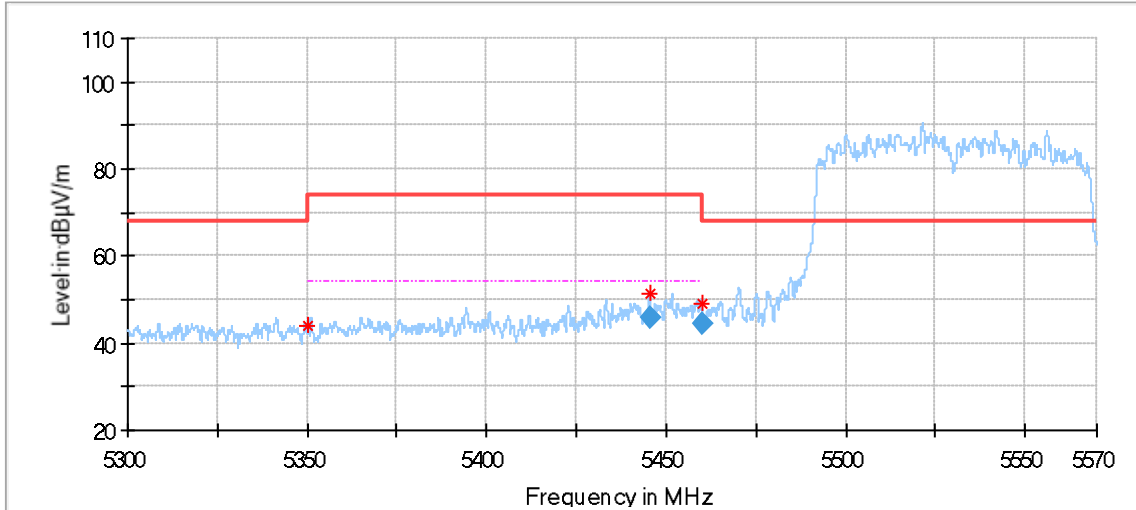
(The Reading Level is recorded by software which is not shown in the sheet)

802.11ac80 Modulation 5530MHz



Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5456.757500	50.37	54.00	3.63	150.0	H	73.0	2.9
5460.000000	49.29	54.00	4.71	150.0	H	98.0	2.9
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5456.757500	50.37	54.00	3.63	150.0	H	73.0	2.9
5460.000000	49.29	54.00	4.71	150.0	H	98.0	2.9

Remark:
 Level=Reading Level + Correction Factor
 Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier
 (The Reading Level is recorded by software which is not shown in the sheet)



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5350.000000	43.99	68.20	24.21	150.0	V	0.0	2.0
5445.485000	51.33	74.00	22.67	150.0	V	6.0	3.0
5460.000000	49.29	68.20	18.91	150.0	V	96.0	2.8
Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5445.485000	45.78	54.00	8.22	150.0	V	6.0	3.0
5460.000000	44.59	54.00	9.41	150.0	V	96.0	2.8

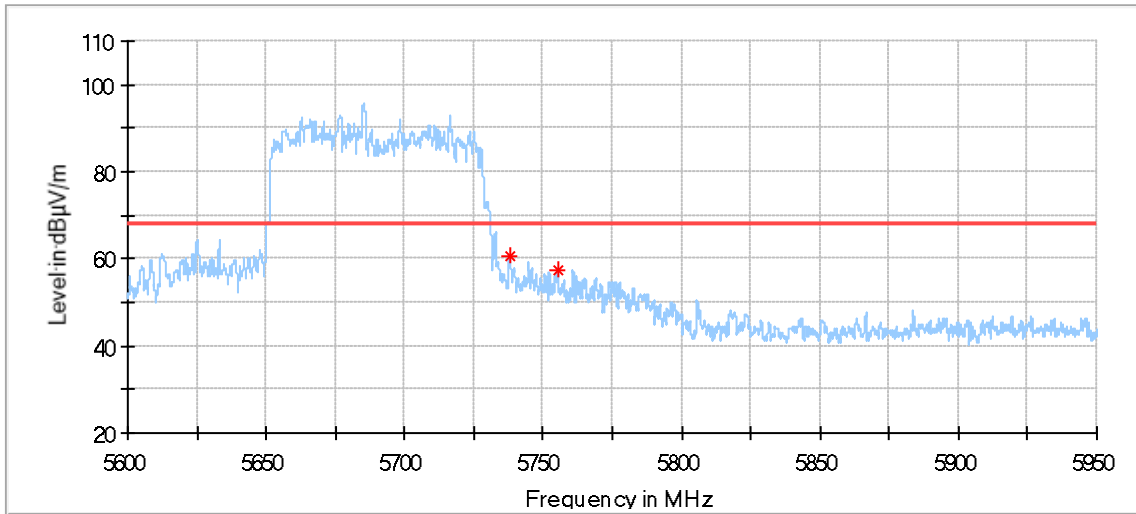
Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)

802.11ac80 Modulation 5690MHz



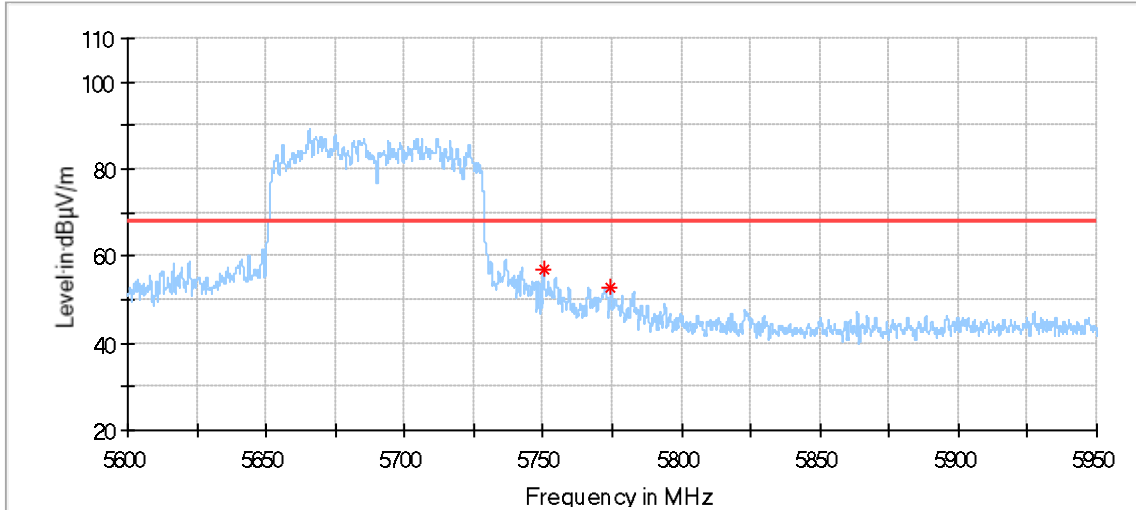
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5737.783333	60.58	68.20	7.62	150.0	H	132.0	2.8
5755.195833	57.50	68.20	10.70	150.0	H	190.0	2.9

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5750.062500	56.79	68.20	11.41	150.0	V	281.0	2.9
5774.445833	52.83	68.20	15.37	150.0	V	215.0	3.0

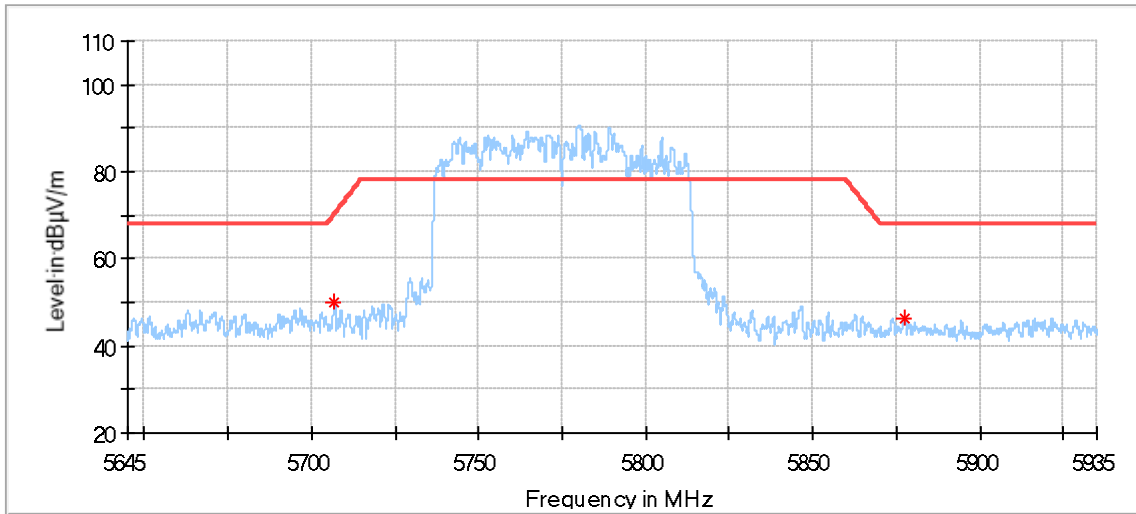
Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)

802.11ac80 Modulation 5775MHz



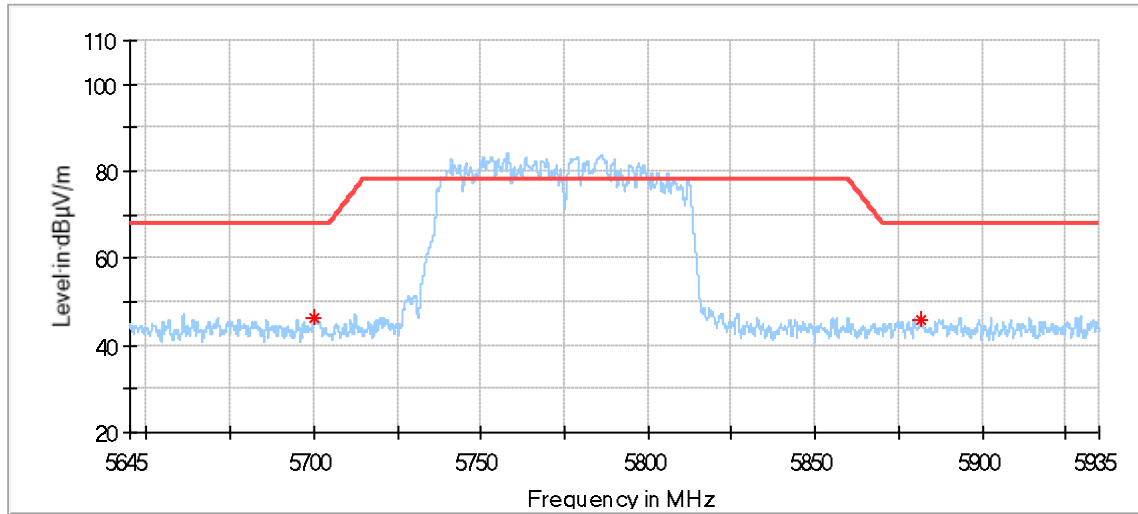
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5706.794167	50.07	69.99	19.92	150.0	H	192.0	2.6
5877.459167	46.28	68.20	21.92	150.0	H	318.0	3.8

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
5700.172500	46.45	68.20	21.75	150.0	V	74.0	2.5
5881.470833	45.97	68.20	22.23	150.0	V	182.0	3.7

Remark:

Level=Reading Level + Correction Factor

Correction Factor=Antenna Factor + Cable Loss – Pre-amplifier

(The Reading Level is recorded by software which is not shown in the sheet)

9.6 Frequencies Stability

Test Method

1. The EUT was placed on 0.8m height table, the RF output of EUT was connected to the test receiver by RF cable. The path loss was compensated to the results for each measurement.
2. Set Centre Frequency of the channel under test.
3. Set Detector PEAK
4. Set RBW: 10KHz, VBW: 3RBW
5. Set Span: Encompass the entire emissions bandwidth (EBW) of the signal.
6. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

User manual temperature is -10°C to 35°C, normal Temperature is +20°C.

Limit: 20ppm

Test Results (All conditions and all modes were performed, only list Worst-Case in the report)

Remark: NV is normal Voltage: 3.85Vdc, HV is High Voltage: 4.393Vdc, LV is Low Voltage: 3.247Vdc, NT is normal Temperature: +20°C.

TestMode	Antenna	Channel	Voltage		Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
			Voltage [Vdc]	Temperature (°C)				
11A	Ant1	5180	NV	NT	45000	8.687259	20	PASS
		5180	LV	NT	44000	8.494208	20	PASS
		5180	HV	NT	44000	8.494208	20	PASS
		5200	NV	NT	44000	8.461538	20	PASS
		5200	LV	NT	44000	8.461538	20	PASS
		5200	HV	NT	44000	8.461538	20	PASS
		5240	NV	NT	45000	8.587786	20	PASS
		5240	LV	NT	45000	8.587786	20	PASS
		5240	HV	NT	45000	8.587786	20	PASS
		5260	NV	NT	44000	8.365019	20	PASS
		5260	LV	NT	44000	8.365019	20	PASS
		5260	HV	NT	44000	8.365019	20	PASS
		5280	NV	NT	43000	8.143939	20	PASS
		5280	LV	NT	43000	8.143939	20	PASS
		5280	HV	NT	43000	8.143939	20	PASS
		5320	NV	NT	43000	8.082707	20	PASS
		5320	LV	NT	43000	8.082707	20	PASS
		5320	HV	NT	43000	8.082707	20	PASS
		5500	NV	NT	45000	8.181818	20	PASS
		5500	LV	NT	45000	8.181818	20	PASS
		5500	HV	NT	45000	8.181818	20	PASS
		5580	NV	NT	45000	8.064516	20	PASS
		5580	LV	NT	46000	8.243728	20	PASS
		5580	HV	NT	46000	8.243728	20	PASS
5700	NV	NT	48000	8.421053	20	PASS		
5700	LV	NT	48000	8.421053	20	PASS		
5700	HV	NT	48000	8.421053	20	PASS		
5720	NV	NT	50000	8.741259	20	PASS		
5720	LV	NT	49000	8.566434	20	PASS		
5720	HV	NT	49000	8.566434	20	PASS		



		5745	NV	NT	50000	8.70322	20	PASS
		5745	LV	NT	49000	8.529156	20	PASS
		5745	HV	NT	49000	8.529156	20	PASS
		5785	NV	NT	50000	8.643042	20	PASS
		5785	LV	NT	50000	8.643042	20	PASS
		5785	HV	NT	50000	8.643042	20	PASS
		5825	NV	NT	50000	8.583691	20	PASS
		5825	LV	NT	50000	8.583691	20	PASS
		5825	HV	NT	50000	8.583691	20	PASS
11N40SIS O	Ant1	5190	NV	NT	45000	8.67052	20	PASS
		5190	LV	NT	44000	8.477842	20	PASS
		5190	HV	NT	43000	8.285164	20	PASS
		5230	NV	NT	59900	11.453155	20	PASS
		5230	LV	NT	55900	10.688337	20	PASS
		5230	HV	NT	53900	10.305927	20	PASS
		5270	NV	NT	47000	8.918406	20	PASS
		5270	LV	NT	47000	8.918406	20	PASS
		5270	HV	NT	46000	8.728653	20	PASS
		5310	NV	NT	42000	7.909605	20	PASS
		5310	LV	NT	42000	7.909605	20	PASS
		5310	HV	NT	41000	7.721281	20	PASS
		5510	NV	NT	41000	7.441016	20	PASS
		5510	LV	NT	42000	7.622505	20	PASS
		5510	HV	NT	42000	7.622505	20	PASS
		5550	NV	NT	40000	7.207207	20	PASS
		5550	LV	NT	41000	7.387387	20	PASS
		5550	HV	NT	42000	7.567568	20	PASS
		5670	NV	NT	42000	7.407407	20	PASS
		5670	LV	NT	42000	7.407407	20	PASS
		5670	HV	NT	43000	7.583774	20	PASS
		5710	NV	NT	41000	7.180385	20	PASS
		5710	LV	NT	43000	7.530648	20	PASS
		5710	HV	NT	43000	7.530648	20	PASS
		5755	NV	NT	41000	7.12424	20	PASS
		5755	LV	NT	43000	7.471764	20	PASS
		5755	HV	NT	43000	7.471764	20	PASS
		5795	NV	NT	42000	7.247627	20	PASS
		5795	LV	NT	44000	7.592752	20	PASS
		5795	HV	NT	44000	7.592752	20	PASS
11AC80SIS O	Ant1	5210	NV	NT	38000	7.293666	20	PASS
		5210	LV	NT	40000	7.677543	20	PASS
		5210	HV	NT	40000	7.677543	20	PASS
		5290	NV	NT	42000	7.939509	20	PASS
		5290	LV	NT	43000	8.128544	20	PASS
		5290	HV	NT	43000	8.128544	20	PASS
		5530	NV	NT	41000	7.414105	20	PASS
		5530	LV	NT	45000	8.137432	20	PASS
		5530	HV	NT	45000	8.137432	20	PASS
		5690	NV	NT	44000	7.732865	20	PASS
		5690	LV	NT	46000	8.084359	20	PASS
		5690	HV	NT	47000	8.260105	20	PASS
		5775	NV	NT	43000	7.445887	20	PASS
		5775	LV	NT	47000	8.138528	20	PASS
		5775	HV	NT	47000	8.138528	20	PASS



TestMode	Antenna	Channel	Temperature					Limit (ppm)	Verdict
			Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)			
11A	Ant1	5180	NV	-10	44000	8.494208	20	PASS	
		5180	NV	0	44000	8.494208	20	PASS	
		5180	NV	10	44000	8.494208	20	PASS	
		5180	NV	20	44000	8.494208	20	PASS	
		5180	NV	35	44000	8.494208	20	PASS	
		5200	NV	-10	44000	8.461538	20	PASS	
		5200	NV	0	44000	8.461538	20	PASS	
		5200	NV	10	44000	8.461538	20	PASS	
		5200	NV	20	44000	8.461538	20	PASS	
		5200	NV	35	44000	8.461538	20	PASS	
		5240	NV	-10	44000	8.396947	20	PASS	
		5240	NV	0	44000	8.396947	20	PASS	
		5240	NV	10	44000	8.396947	20	PASS	
		5240	NV	20	44000	8.396947	20	PASS	
		5240	NV	35	44000	8.396947	20	PASS	
		5260	NV	-10	44000	8.365019	20	PASS	
		5260	NV	0	43000	8.174905	20	PASS	
		5260	NV	10	43000	8.174905	20	PASS	
		5260	NV	20	43000	8.174905	20	PASS	
		5260	NV	35	43000	8.174905	20	PASS	
		5280	NV	-10	43000	8.143939	20	PASS	
		5280	NV	0	43000	8.143939	20	PASS	
		5280	NV	10	43000	8.143939	20	PASS	
		5280	NV	20	43000	8.143939	20	PASS	
		5280	NV	35	43000	8.143939	20	PASS	
		5320	NV	-10	43000	8.082707	20	PASS	
		5320	NV	0	43000	8.082707	20	PASS	
		5320	NV	10	43000	8.082707	20	PASS	
		5320	NV	20	43000	8.082707	20	PASS	
		5320	NV	35	43000	8.082707	20	PASS	
		5500	NV	-10	45000	8.181818	20	PASS	
		5500	NV	0	45000	8.181818	20	PASS	
		5500	NV	10	45000	8.181818	20	PASS	
		5500	NV	20	45000	8.181818	20	PASS	
		5500	NV	35	45000	8.181818	20	PASS	
		5580	NV	-10	46000	8.243728	20	PASS	
		5580	NV	0	46000	8.243728	20	PASS	
		5580	NV	10	46000	8.243728	20	PASS	
		5580	NV	20	46000	8.243728	20	PASS	
		5580	NV	35	46000	8.243728	20	PASS	
5700	NV	-10	48000	8.421053	20	PASS			
5700	NV	0	48000	8.421053	20	PASS			
5700	NV	10	48000	8.421053	20	PASS			
5700	NV	20	48000	8.421053	20	PASS			
5700	NV	35	48000	8.421053	20	PASS			
5720	NV	-10	49000	8.566434	20	PASS			
5720	NV	0	49000	8.566434	20	PASS			
5720	NV	10	49000	8.566434	20	PASS			
5720	NV	20	49000	8.566434	20	PASS			
5720	NV	35	49000	8.566434	20	PASS			
5745	NV	-10	49000	8.529156	20	PASS			
5745	NV	0	49000	8.529156	20	PASS			
5745	NV	10	49000	8.529156	20	PASS			
5745	NV	20	49000	8.529156	20	PASS			
5745	NV	35	49000	8.529156	20	PASS			
5785	NV	-10	50000	8.643042	20	PASS			
5785	NV	0	50000	8.643042	20	PASS			
5785	NV	10	50000	8.643042	20	PASS			
5785	NV	20	50000	8.643042	20	PASS			



		5785	NV	35	50000	8.643042	20	PASS
		5825	NV	-10	50000	8.583691	20	PASS
		5825	NV	0	50000	8.583691	20	PASS
		5825	NV	10	50000	8.583691	20	PASS
		5825	NV	20	50000	8.583691	20	PASS
		5825	NV	35	50000	8.583691	20	PASS
11N40SIS O	Ant1	5190	NV	-10	43000	8.285164	20	PASS
		5190	NV	0	42000	8.092486	20	PASS
		5190	NV	10	42000	8.092486	20	PASS
		5190	NV	20	42000	8.092486	20	PASS
		5190	NV	35	42000	8.092486	20	PASS
		5230	NV	-10	50900	9.732314	20	PASS
		5230	NV	0	50000	9.560229	20	PASS
		5230	NV	10	50000	9.560229	20	PASS
		5230	NV	20	49000	9.369025	20	PASS
		5230	NV	35	48000	9.17782	20	PASS
		5270	NV	-10	45000	8.538899	20	PASS
		5270	NV	0	45000	8.538899	20	PASS
		5270	NV	10	45000	8.538899	20	PASS
		5270	NV	20	44000	8.349146	20	PASS
		5270	NV	35	43000	8.159393	20	PASS
		5310	NV	-10	41000	7.721281	20	PASS
		5310	NV	0	41000	7.721281	20	PASS
		5310	NV	10	41000	7.721281	20	PASS
		5310	NV	20	41000	7.721281	20	PASS
		5310	NV	35	41000	7.721281	20	PASS
		5510	NV	-10	42000	7.622505	20	PASS
		5510	NV	0	42000	7.622505	20	PASS
		5510	NV	10	41000	7.441016	20	PASS
		5510	NV	20	41000	7.441016	20	PASS
		5510	NV	35	41000	7.441016	20	PASS
		5550	NV	-10	42000	7.567568	20	PASS
		5550	NV	0	42000	7.567568	20	PASS
		5550	NV	10	41000	7.387387	20	PASS
		5550	NV	20	42000	7.567568	20	PASS
		5550	NV	35	42000	7.567568	20	PASS
		5670	NV	-10	43000	7.583774	20	PASS
		5670	NV	0	43000	7.583774	20	PASS
		5670	NV	10	42000	7.407407	20	PASS
		5670	NV	20	42000	7.407407	20	PASS
		5670	NV	35	43000	7.583774	20	PASS
		5710	NV	-10	43000	7.530648	20	PASS
		5710	NV	0	43000	7.530648	20	PASS
		5710	NV	10	43000	7.530648	20	PASS
		5710	NV	20	43000	7.530648	20	PASS
		5710	NV	35	43000	7.530648	20	PASS
		5755	NV	-10	44000	7.645526	20	PASS
		5755	NV	0	44000	7.645526	20	PASS
5755	NV	10	44000	7.645526	20	PASS		
5755	NV	20	44000	7.645526	20	PASS		
5755	NV	35	44000	7.645526	20	PASS		
5795	NV	-10	44000	7.592752	20	PASS		
5795	NV	0	44000	7.592752	20	PASS		
5795	NV	10	44000	7.592752	20	PASS		
5795	NV	20	44000	7.592752	20	PASS		
5795	NV	35	44000	7.592752	20	PASS		
11AC80SIS O	Ant1	5210	NV	-10	41000	7.869482	20	PASS
		5210	NV	0	41000	7.869482	20	PASS
		5210	NV	10	41000	7.869482	20	PASS
		5210	NV	20	41000	7.869482	20	PASS
		5210	NV	35	41000	7.869482	20	PASS
		5290	NV	-10	43000	8.128544	20	PASS
		5290	NV	0	44000	8.31758	20	PASS
5290	NV	10	43000	8.128544	20	PASS		



		5290	NV	20	44000	8.31758	20	PASS
		5290	NV	35	43000	8.128544	20	PASS
		5530	NV	-10	45000	8.137432	20	PASS
		5530	NV	0	45000	8.137432	20	PASS
		5530	NV	10	45000	8.137432	20	PASS
		5530	NV	20	45000	8.137432	20	PASS
		5530	NV	35	45000	8.137432	20	PASS
		5690	NV	-10	47000	8.260105	20	PASS
		5690	NV	0	47000	8.260105	20	PASS
		5690	NV	10	47000	8.260105	20	PASS
		5690	NV	20	47000	8.260105	20	PASS
		5690	NV	35	47000	8.260105	20	PASS
		5775	NV	-10	48000	8.311688	20	PASS
		5775	NV	0	48000	8.311688	20	PASS
		5775	NV	10	48000	8.311688	20	PASS
		5775	NV	20	48000	8.311688	20	PASS
		5775	NV	35	48000	8.311688	20	PASS

9.7 Dynamic Frequency Selection (DFS)

1、 General Test Condition

Parameters of EUT	
Frequency	5250 – 5350 MHz & 5470 – 5725 MHz
Operational Mode	Slave
Modulation:	OFDM
Channel Bandwidth:	20 MHz , 40 MHz. 80 MHz

Note: This device was functioned as a Slave device during the DFS

2、 Test requirement

The manufacturer shall whether the EUT is capable of operating as a master and a client. Id the EUT is capable of operating in more than one operating mode then each operating mode shall be tested separately.

DFS Applicability

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
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

DFS Applicability During Normal Operation

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

3、 Test Limited

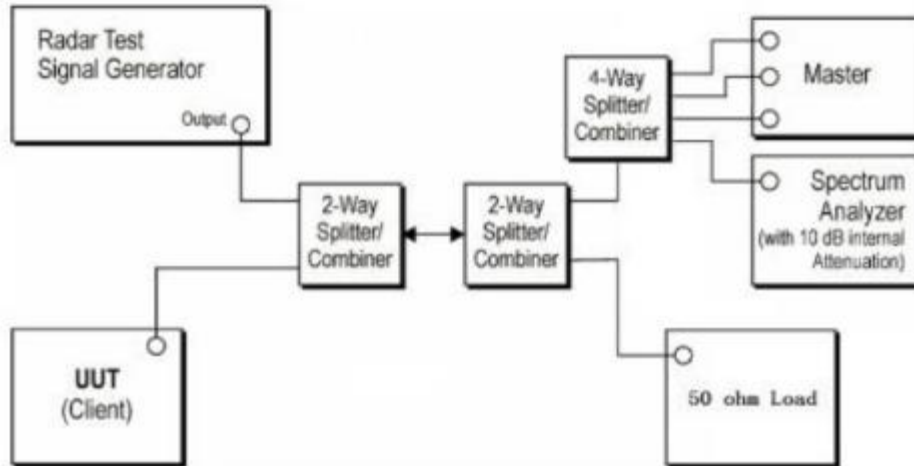
According to KDB 905462 D02 Table 4 DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
<p>Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p>Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> 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.</p> <p>Note 3: During the <i>U-NII Detection Bandwidth</i> 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.</p>	

4、 Calibration of Radar Waveform

- (1) A 50ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master.
- (2) The interference Radar Detection Threshold Level is $-62\text{dBm}+3.7\text{dB}+1.5\text{dB}=-55.8\text{dBm}$ that had been taken into account the output power range and antenna gain.
- (3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3MHz. The spectrum analyzer had offset -1.5dB to compensate RF cable loss 1.5dB.
- (4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $-62\text{dBm}+3.7\text{dB}+1.5\text{dB}=-55.8\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

Conducted Calibration Setup:



Radar Waveform Calibration result:

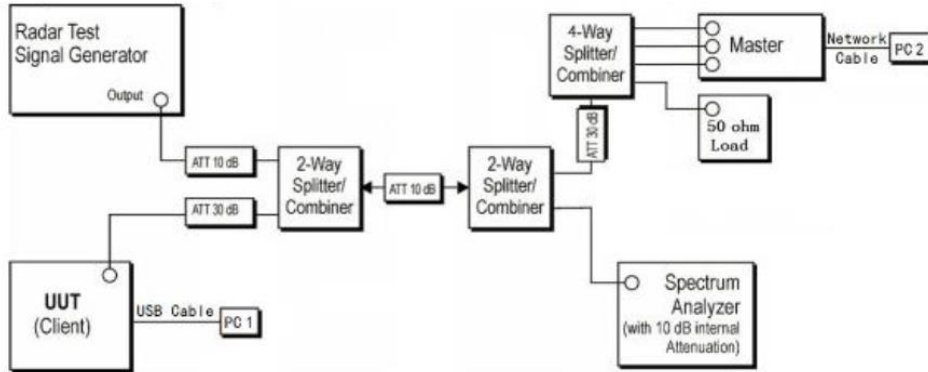
5、 Channel Closing Transmission Time, Channel Move Time and Non-Occupancy Period.

Block Diagram of test setup test procedure.

- (1) The Radar Pulse generator is setup to provide a pulse at frequency that the master and client are operating, A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
- (2) The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -55.8dBm at the antenna of the master device.
- (3) A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
- (4) EUT will associate with the master at channel. The file "iperf.exe" specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using test software in order to properly load the network for the entire period of the test.
- (5) When radar burst with a Level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection threshold +1dB.
- (6) Observer the transmissions of the EUT at the end of the radar Burst on the Operating channel. Measure and record the transmissions from the UUT during The observation time (channel move time). One 15 seconds plot is reported for the short pulse radar type 0. The plot for the short pulse radar burst. The channel move time will be calculated based on the zoom in 600ms plot of the short pulse radar type.
- (7) Measurement of the aggregate duration of the channel closing transmission time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $D_{well} (3.0) = S(12000ms)/B(4000)$; where dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of channel closing transmission time is calculated by: $C(ms) = N \times D_{well} (0.3ms)$; where C is the closing time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and dwell is the dwell time per bin.
- (8) Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test Setup:

Setup for client with injection at the master.

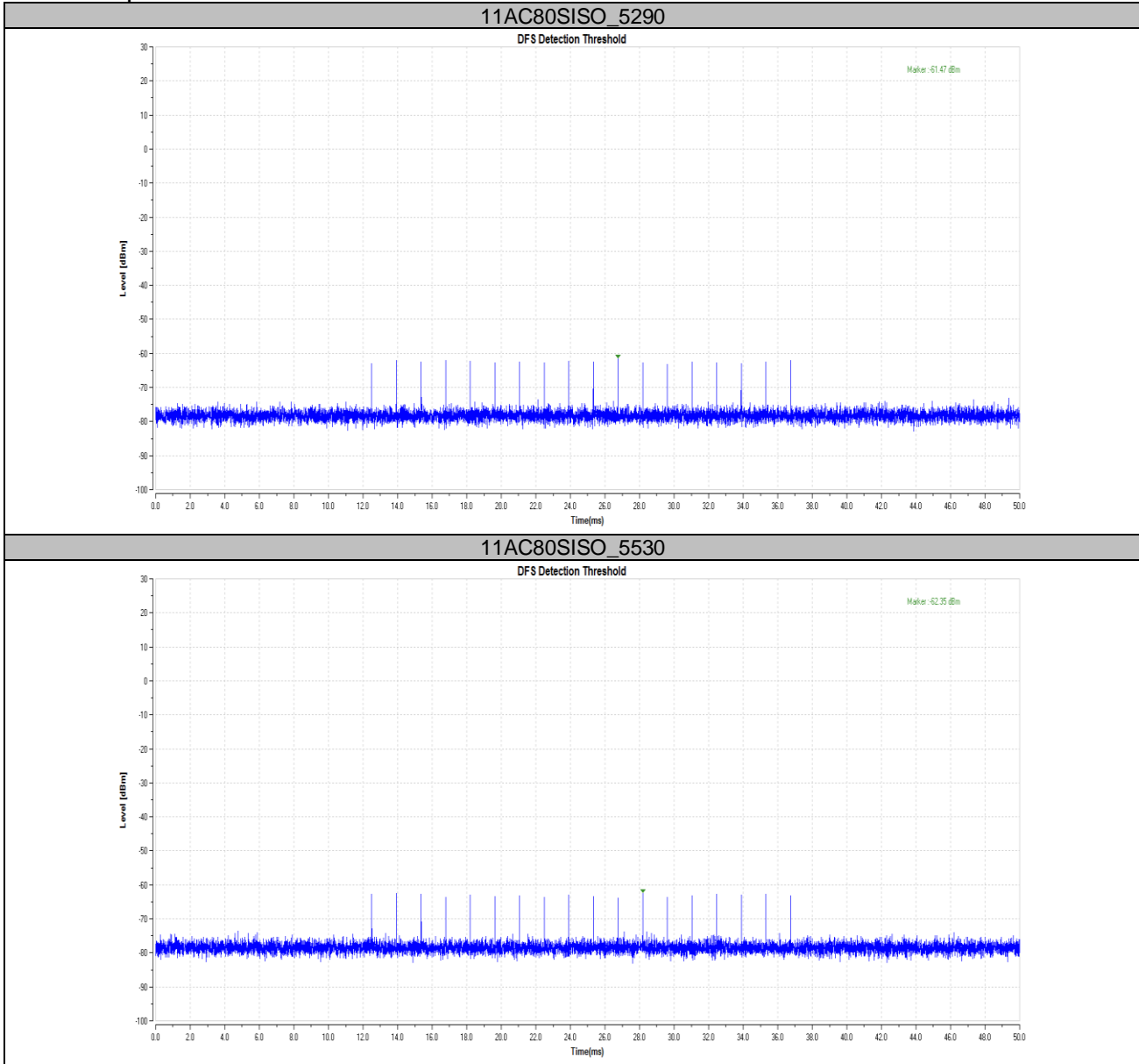


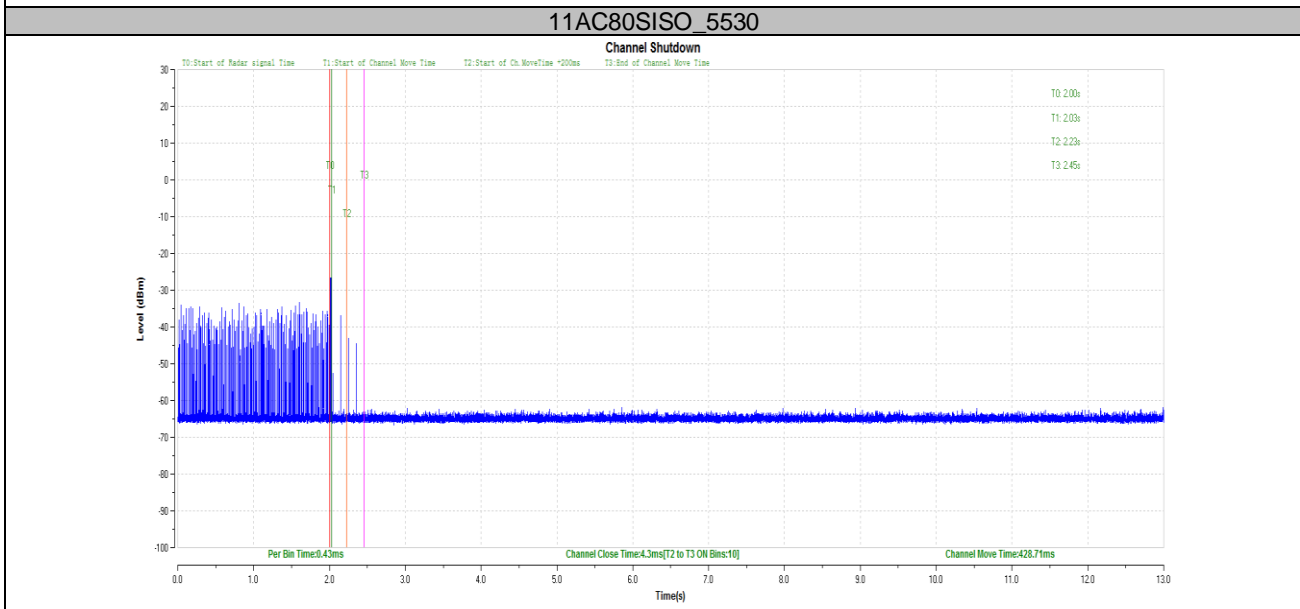
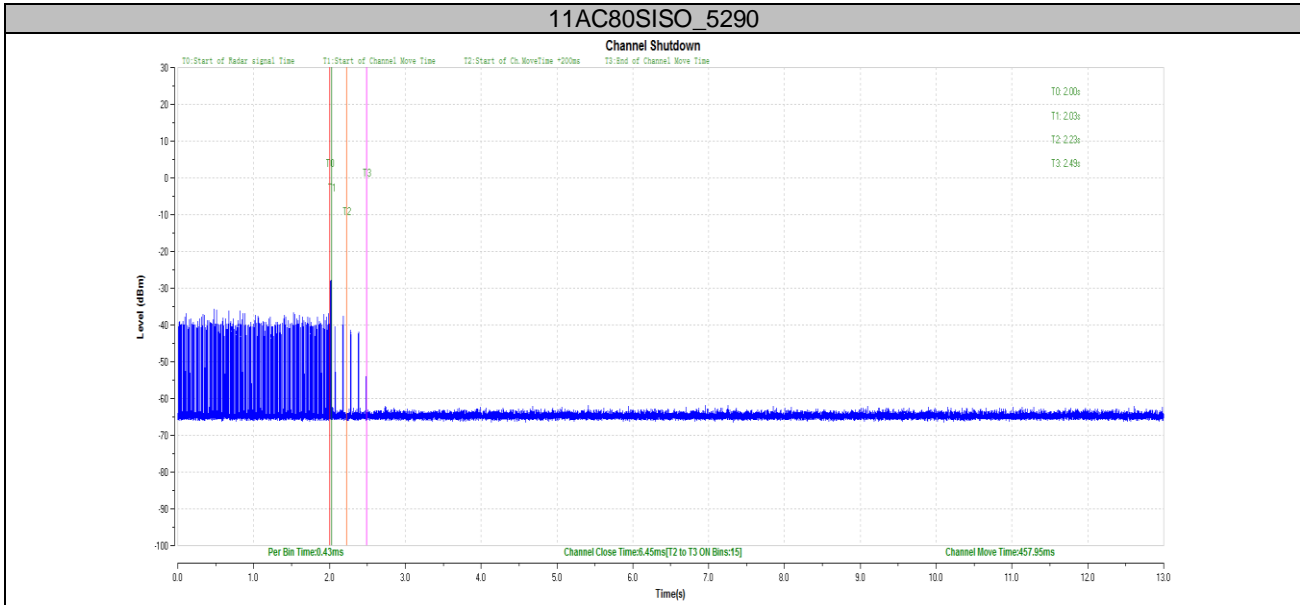
6、 Test Result

Clause	Test Parameter	Remarks	Pass/Fail
15.407	DFS Detection Threshold	No Applicable	N/A
15.407	Channel Availability Check time	No Applicable	N/A
15.407	Channel Move time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non-Occupancy Period	Applicable	Pass
15.407	Uniform Spreading	No Applicable	N/A
15.407	U-NII Detection Bandwidth	No Applicable	N/A

TestMode	Channel	CCT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11AC80SISO	5290	6.45	60	457.95	10000	PASS
	5530	4.3	60	428.71	10000	PASS

Test Graphs





10 Test Equipment List

Conducted Emission Test

Description	Manufacturer	Model no.	Serial no.	cal. due date
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2020-6-28
LISN	Rohde & Schwarz	ENV4200	100249	2020-6-28
Attenuator	Shanghai Huaxiang	TS2-26-3	080928189	2020-6-28
Test software	Rohde & Schwarz	EMC32	Version9.15.00	N/A

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101031	2020-6-28
High Pass Filter (HPF)	UCL	UCL-BPF1-7G	1504005103	2020-6-28
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2020-6-29
Horn Antenna	Rohde & Schwarz	HF907	102295	2020-6-22
Wideband Horn Antenna	Q-PAR	QWH-SL-18-40-K-SG	12827	2020-7-12
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2020-6-28
Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2020-7-16
Attenuator	Agilent	8491A	MY39264334	2020-6-28
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

RF conducted test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2020-6-28
Power Splitter	Weinschel	1580	SC319	2020-7-7
Vector Signal Generator	Rohde & Schwarz	SMBV100A	262825	2020-6-28
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2020-7-6
Test software	Tonscend	System for BT/WIFI	Version 2.6	N/A

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission 150kHz-30MHz (for test using AMN ENV432 or ENV4200)	3.62dB
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.81dB; Vertical: 4.89dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.69dB; Vertical: 4.68dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 4.89dB; Vertical: 4.87dB;
Uncertainty for Conducted RF test with TS 8997	RF Power Conducted: 1.16dB Frequency test involved: 0.6×10^{-7} or 1%

THE END