TEST REPORT

Report No.:	BCTC2110851942-4E
Applicant:	ROCKPI TRADING LIMITED
Product Name:	ROCK Pi 4
Model/Type Ref.:	ROCK Pi 4 MODEL B+
Tested Date:	2021-10-25 to 2021-11-03
Issued Date:	2021-11-03

Shenzhen BCTC Testing Co., Ltd.

FCC ID:2A3PA-ROCKPI4

Product Name:	ROCK Pi 4
Trademark:	N/A
Model/Type Ref.:	ROCK Pi 4 MODEL B+ ROCK Pi 4 MODEL A, ROCK Pi 4 MODEL A+, ROCK Pi 4 MODEL B
Prepared For:	ROCKPI TRADING LIMITED
Address:	Room 11, 27/f, Ga wah international centre, 191 Javaroad, north point, Hong Kong, China
Manufacturer:	ROCKPI TRADING LIMITED
Address:	Room 11, 27/f, Ga wah international centre, 191 Javaroad, north point, Hong Kong, China
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2021-10-25
Sample tested Date:	2021-10-25 to 2021-11-03
Issue Date:	2021-11-03
Report No.:	BCTC2110851942-4E
Test Standards:	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v02r01
Test Results:	PASS

Tested by:

Kelsey Tan

Kelsey Tan/ Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

Table Of Content

(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2110851942-4E	2021-11-03	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No	Results
1	Spurious Radiated Emissions	15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(6)	PASS
2	Conducted Emission	15.207	N/A
3	26 dB and 99% Emission Bandwidth	15.407 (a)(5) 15.1049	PASS
4	Minimum 6 dB bandwidth	15.407(e)	PASS
5	Maximum Conducted Output Power	15.407 (a)(1) 15.407 (a)(3)	PASS
6	Band Edge	2.1051, 15.407(b)(1) 15.407(b)(4)	PASS
7	Power Spectral Density	15.407 (a)(1) 15.407 (a)(3)	PASS
8	Spurious Emissions at Antenna Terminals	2.1051, 15.407(b)	PASS
8	Antenna Requirement	15.203	PASS

3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information And Test Setup

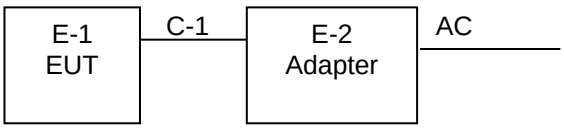
4.1 Product Information

Model/Type Ref.:	ROCK Pi 4 MODEL B+ ROCK Pi 4 MODEL A, ROCK Pi 4 MODEL A+, ROCK Pi 4 MODEL B
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported	802.11a/n/ac(20MHz channel bandwidth) 802.11n/ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth)
Operation Frequency:	5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80;
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS9
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
Number Of Channel	4 channels for 802.11a/n20 in the 5180-5240MHz band ; 2 channels for 802.11 n40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ;
Antenna installation:	Chip antenna
Antenna Gain:	2dBi
Ratings:	DC 9V/12V/15V/20/V

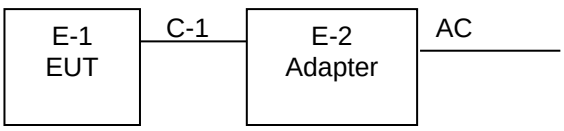
4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	ROCK Pi 4	N/A	ROCK Pi 4 MODEL B+	N/A	EUT
E-2	Adapter	N/A	BCTC001	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

802.11a/n/ac(20MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	-	-	-	-
40	5200	48	5240	-	-	-	-

802.11n /ac(40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	-	-	-	-	-	-
46	5230	-	-	-	-	-	-

802.11ac (80MHz) Carrier Frequency Channel	
Channel	Frequency (MHz)
42	5210

4.5 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 2	802.11n/ ac40 CH38/ CH 46
Mode 3	802.11 ac80 CH 42
Mode 4	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 2	802.11n/ ac40 CH38/ CH 46
Mode 3	802.11 ac80 CH 42

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	CMD		
Parameters	DEF	DEF	DEF

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850

IC Registered No.: 23583

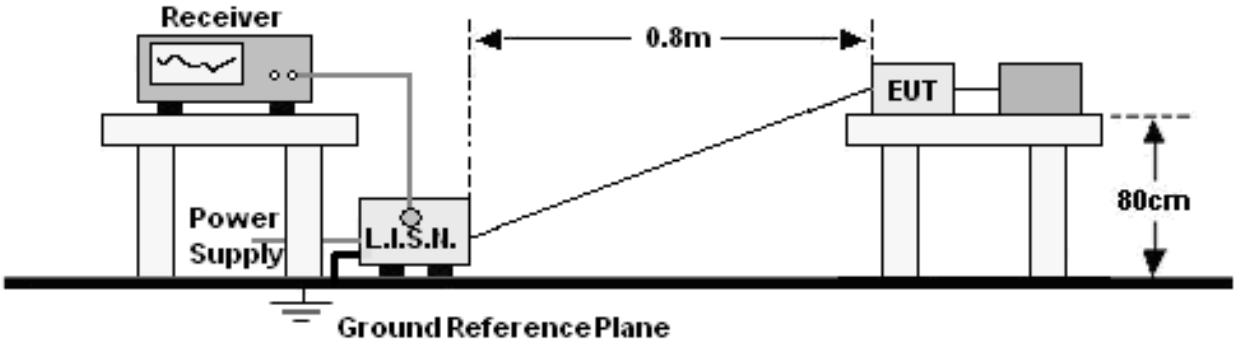
5.2 Test Instrument Used

RF conducted test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power Metter	Keysight	E4419B	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9 300A	\	May 28, 2021	May 27, 2022
Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer 9kHz-40GHz	R&S	FSP40	100363	May 28, 2021	May 27, 2022

Radiated emissions Test (966 chamber)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
Receiver	R&S	ESRP	101154	May 28, 2021	May 27, 2022
Amplifier	SKET	LAPA_01G18G-45dB	\	May 28, 2021	May 27, 2022
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 28, 2021	May 27, 2022
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Jun. 01, 2021	May 31, 2022
Horn Antenna	SCHWARZBECK	BBHA9120D	1541	Jun. 02, 2021	Jun. 01, 2022
Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA9170	822	May 28, 2021	May 27, 2022
Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 28, 2021	May 27, 2022
Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	014	Jun. 02, 2021	Jun. 01, 2022
RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	May 28, 2021	May 27, 2022
RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	May 28, 2021	May 27, 2022
RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 28, 2021	May 27, 2022
Power Metter	Keysight	E4419B	\	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9 300A	\	May 28, 2021	May 27, 2022
Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer 9kHz-40GHz	Agilent	FSP40	100363	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

FREQUENCY (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Notes: 1. *Decreasing linearly with logarithm of frequency. 2. The lower limit shall apply at the transition frequencies.		

6.3 Test Procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

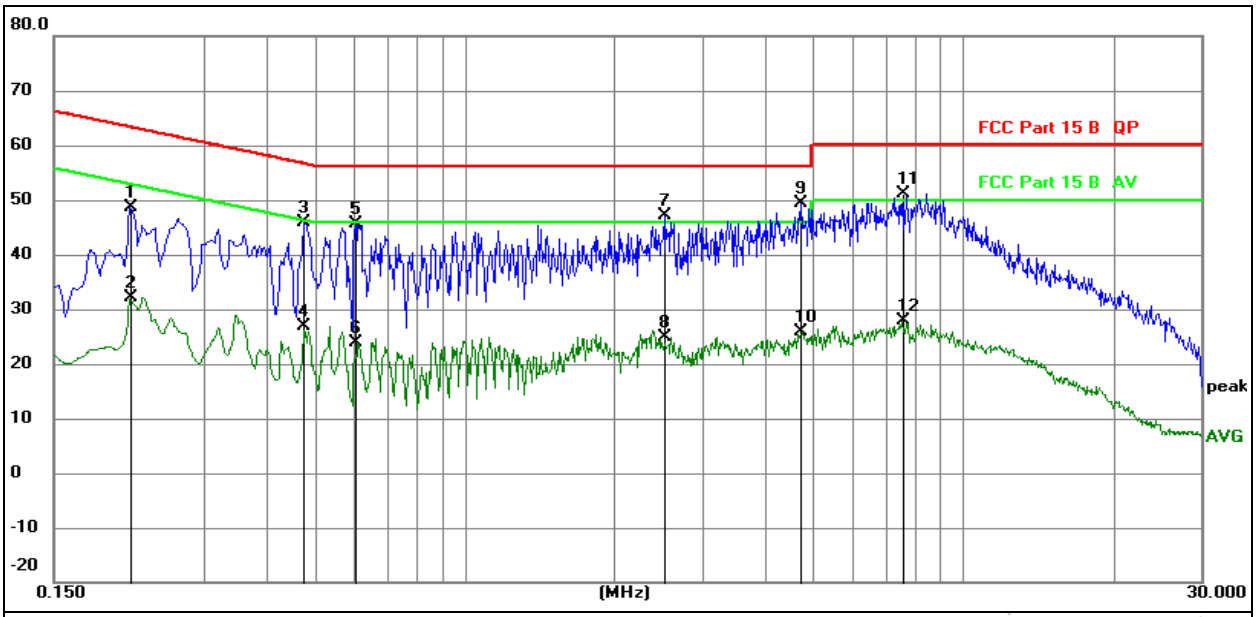
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

6.5 Test Result

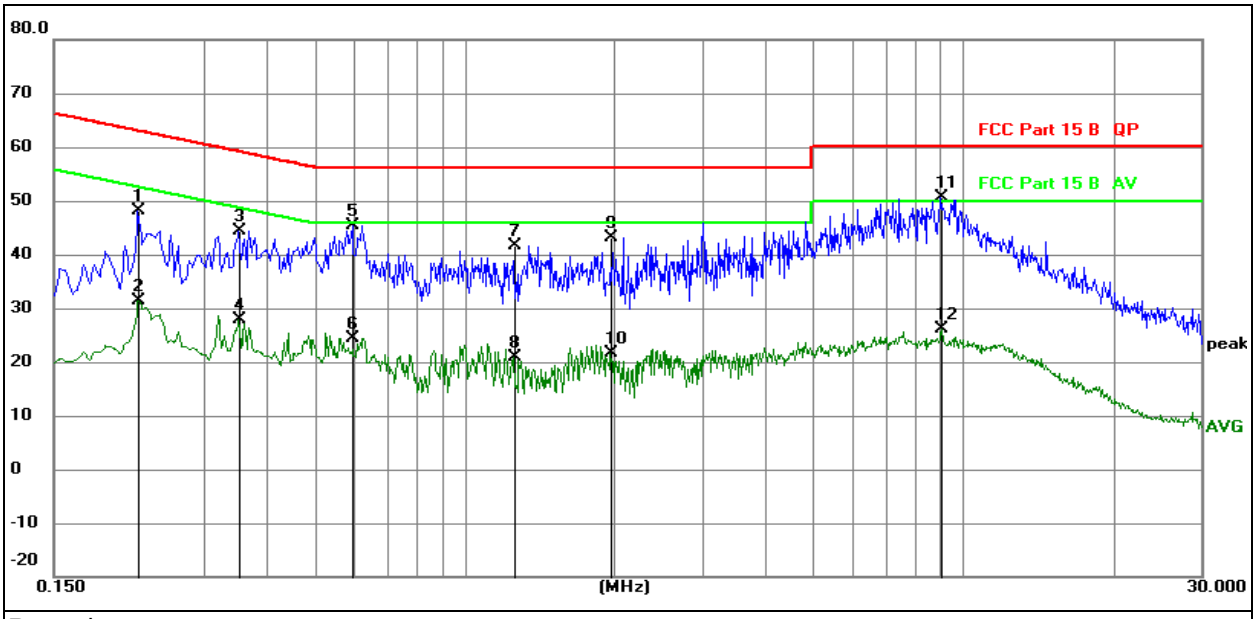
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC120V/60Hz	Test Mode:	Mode 4



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2128	28.92	19.61	48.53	63.10	-14.57	QP
2		0.2128	12.63	19.61	32.24	53.10	-20.86	AVG
3		0.4761	26.34	19.62	45.96	56.41	-10.45	QP
4		0.4761	7.23	19.62	26.85	46.41	-19.56	AVG
5		0.6043	25.92	19.62	45.54	56.00	-10.46	QP
6		0.6043	4.17	19.62	23.79	46.00	-22.21	AVG
7		2.5133	27.43	19.64	47.07	56.00	-8.93	QP
8		2.5133	5.18	19.64	24.82	46.00	-21.18	AVG
9	*	4.7213	29.60	19.70	49.30	56.00	-6.70	QP
10		4.7213	6.24	19.70	25.94	46.00	-20.06	AVG
11		7.5258	31.30	19.75	51.05	60.00	-8.95	QP
12		7.5258	8.01	19.75	27.76	50.00	-22.24	AVG

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC120V/60Hz	Test Mode:	Mode 4



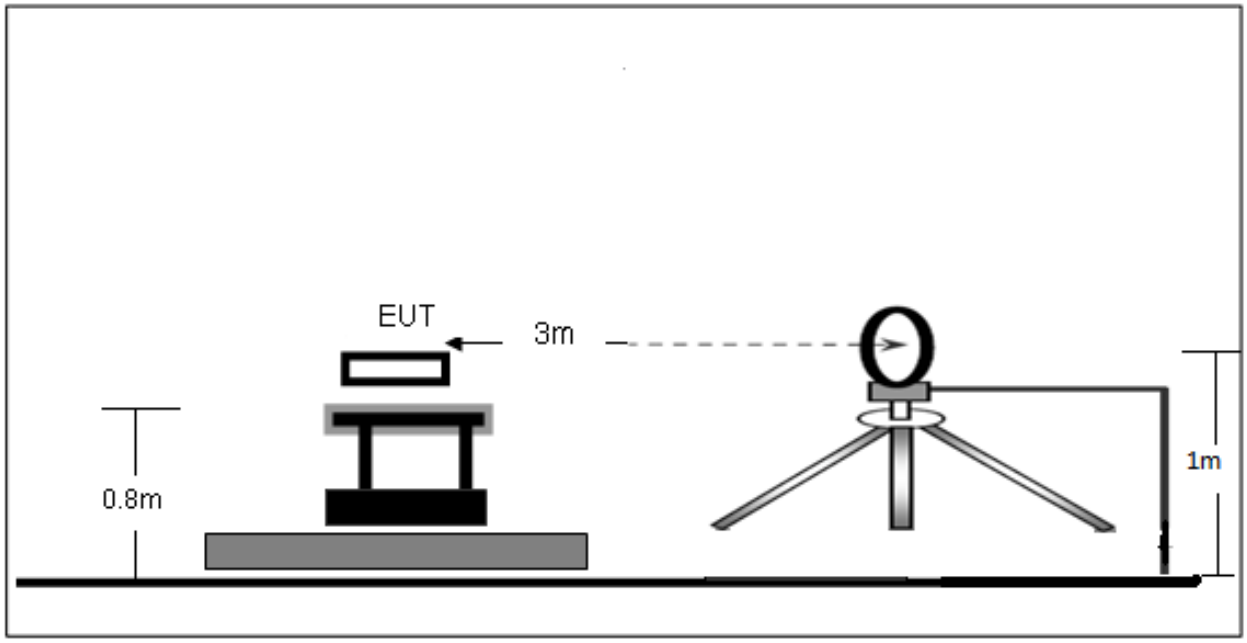
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2220	28.53	19.61	48.14	62.74	-14.60	QP
2		0.2220	11.78	19.61	31.39	52.74	-21.35	AVG
3		0.3525	24.80	19.62	44.42	58.90	-14.48	QP
4		0.3525	8.35	19.62	27.97	48.90	-20.93	AVG
5		0.5955	25.65	19.62	45.27	56.00	-10.73	QP
6		0.5955	4.77	19.62	24.39	46.00	-21.61	AVG
7		1.2615	21.97	19.63	41.60	56.00	-14.40	QP
8		1.2615	1.34	19.63	20.97	46.00	-25.03	AVG
9		1.9680	23.45	19.63	43.08	56.00	-12.92	QP
10		1.9680	2.05	19.63	21.68	46.00	-24.32	AVG
11	*	9.0510	30.85	19.78	50.63	60.00	-9.37	QP
12		9.0510	6.38	19.78	26.16	50.00	-23.84	AVG

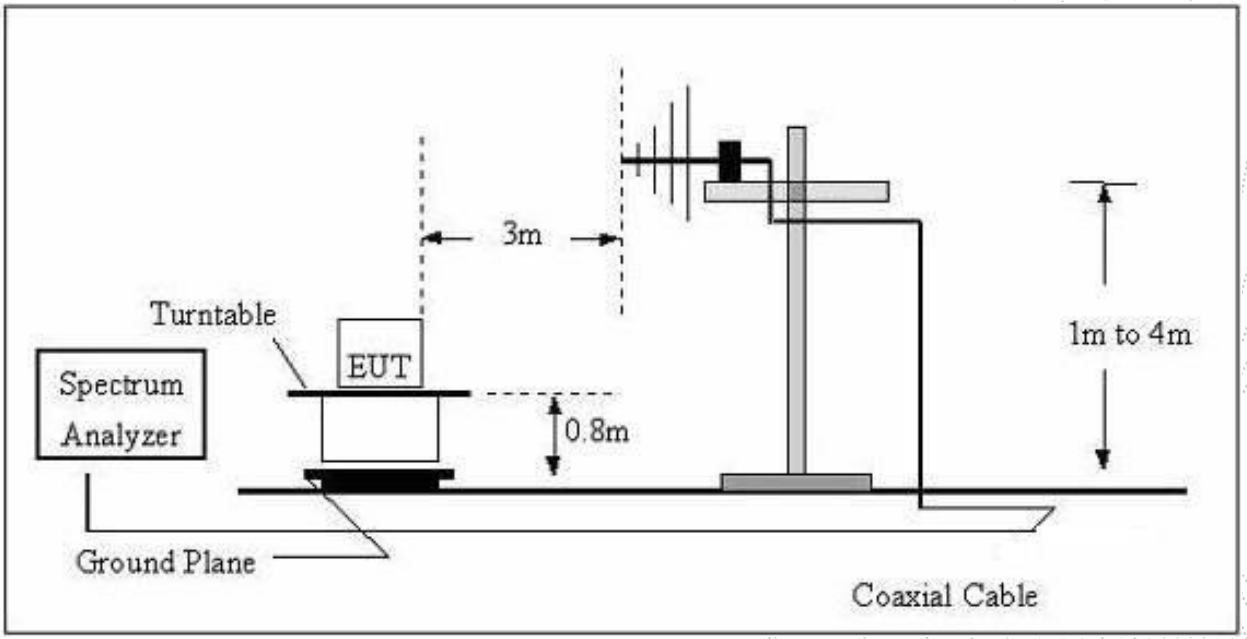
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

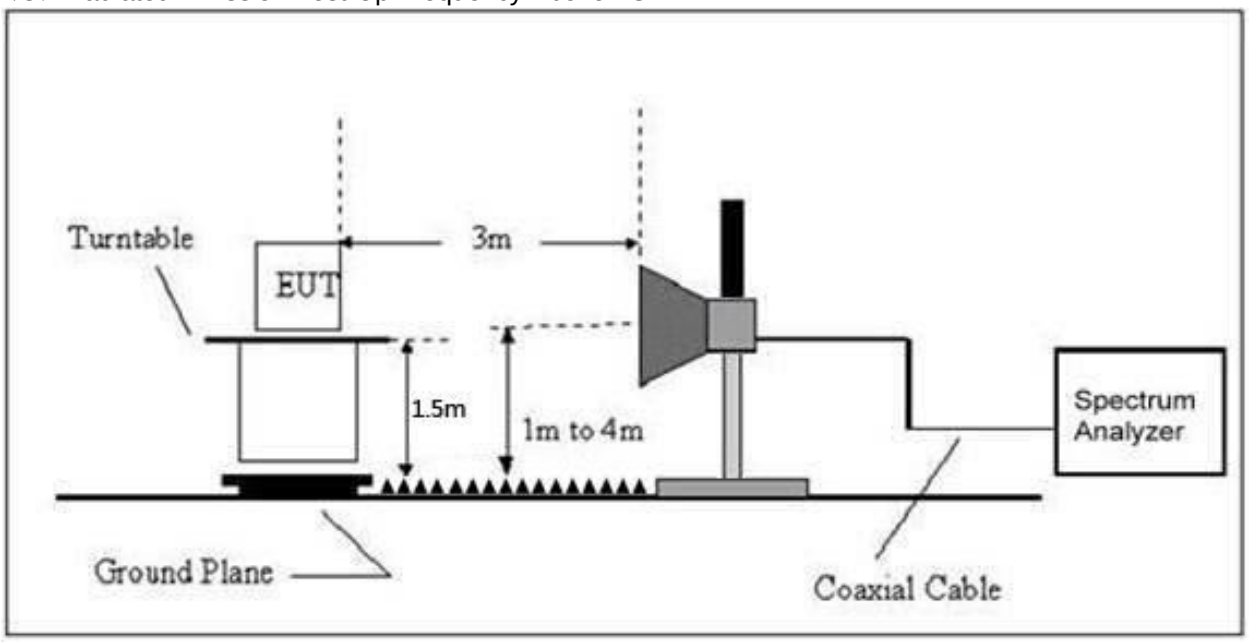
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance	
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:
(1)The limit for radiated test was performed according to FCC PART 15C.
(2)The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).

7.3 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205.
It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the
narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.
.

7.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

7.5 Test Result

Below 30MHz

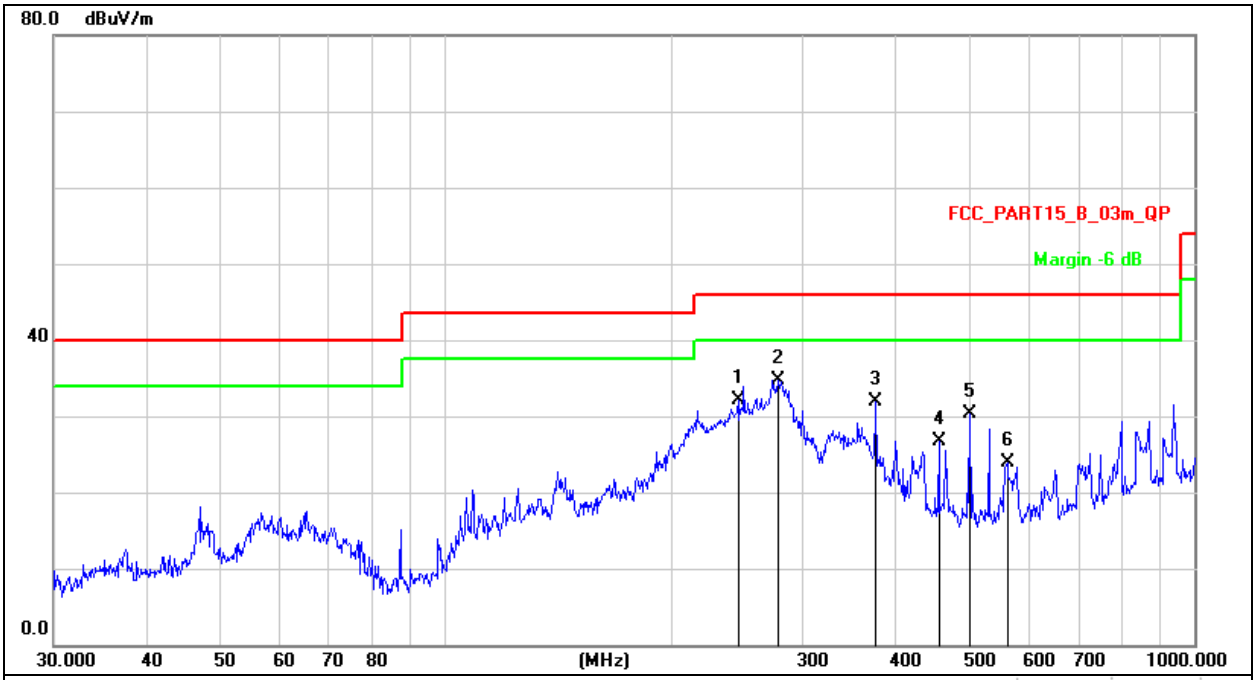
Temperature：	26℃	Relative Humidtity：	24%
Pressure：	101 kPa	Test Voltage :	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

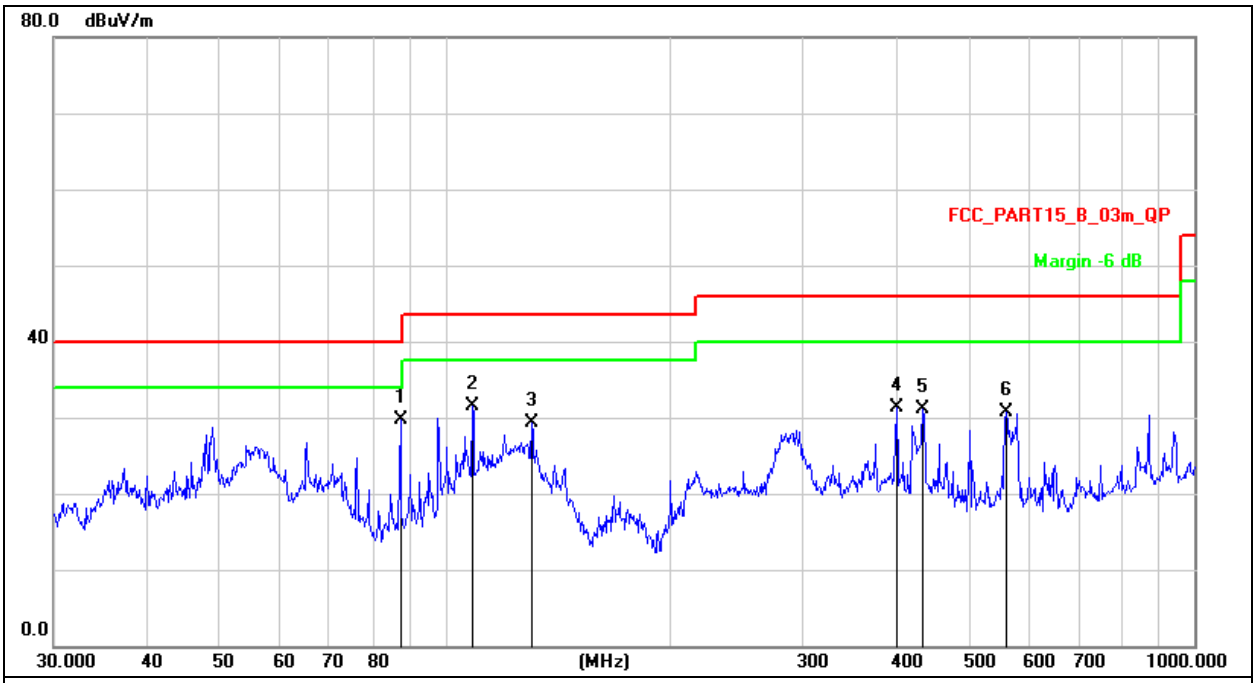
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage :	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	Horizontal



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		245.9509	47.26	-15.24	32.02	46.00	-13.98	QP
2	*	278.0668	48.90	-14.28	34.62	46.00	-11.38	QP
3		375.9385	43.55	-11.64	31.91	46.00	-14.09	QP
4		455.9058	36.46	-9.85	26.61	46.00	-19.39	QP
5		501.1790	39.19	-8.91	30.28	46.00	-15.72	QP
6		562.6624	31.20	-7.39	23.81	46.00	-22.19	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101 kpa	Test Voltage :	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	Vertical



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	87.1117	48.39	-18.77	29.62	40.00	-10.38	QP
2		108.6470	48.37	-16.84	31.53	43.50	-11.97	QP
3		130.3789	47.46	-18.24	29.22	43.50	-14.28	QP
4		400.4319	42.41	-11.08	31.33	46.00	-14.67	QP
5		434.0651	41.39	-10.33	31.06	46.00	-14.94	QP
6		560.6928	38.18	-7.43	30.75	46.00	-15.25	QP

Between 1GHz – 40GHz

Test Mode :	TX(5.1G) - 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.169	63.58	5.94	35.40	44.00	60.92	68.20	-7.28	PK
V	4434.169	43.87	5.94	35.40	44.00	41.21	54.00	-12.79	AV
V	10360.080	62.18	8.46	39.75	44.50	65.89	74.00	-8.11	PK
V	10360.080	43.60	8.46	39.75	44.50	47.31	54.00	-6.69	AV
V	15540.142	62.68	10.12	38.80	44.10	67.50	74.00	-6.50	PK
V	15540.142	43.01	10.12	38.80	42.70	49.23	54.00	-4.77	AV
H	4434.009	61.21	5.94	35.18	44.00	58.33	68.20	-9.87	PK
H	4434.009	43.32	5.94	35.18	44.00	40.44	54.00	-13.56	AV
H	10360.087	50.43	8.46	38.71	44.50	53.10	74.00	-20.90	PK
H	10360.087	40.59	8.46	38.71	44.50	43.26	54.00	-10.74	AV
H	15540.148	50.21	10.12	38.38	44.10	54.61	74.00	-19.39	PK
H	15540.148	42.84	10.12	38.38	44.10	47.24	54.00	-6.76	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.023	64.21	6.48	36.35	44.05	62.99	74.00	-11.01	PK
V	4592.023	43.97	6.48	36.35	44.05	42.75	54.00	-11.25	AV
V	10400.175	64.37	8.47	37.88	44.51	66.21	68.20	-1.99	PK
V	10400.175	43.70	8.47	37.88	44.51	45.54	54.00	-8.46	AV
V	15600.030	64.75	10.12	38.80	44.10	69.57	74.00	-4.43	PK
V	15600.030	43.93	10.12	38.80	42.70	50.15	54.00	-3.85	AV
H	4592.007	62.65	6.48	36.37	44.05	61.45	74.00	-12.55	PK
H	4592.007	43.41	6.48	36.37	44.05	42.21	54.00	-11.79	AV
H	10400.089	54.00	8.47	38.64	44.50	56.61	68.20	-11.59	PK
H	10400.089	42.33	8.47	38.64	44.50	44.94	54.00	-9.06	AV
H	15600.108	53.25	10.12	38.38	44.10	57.65	74.00	-16.35	PK
H	15600.108	40.90	10.12	38.38	44.10	45.30	54.00	-8.70	AV
High Channel (5240 MHz)-Above 1G									
V	4739.047	61.91	7.10	37.24	43.50	62.75	74.00	-11.25	PK
V	4739.047	43.81	7.10	37.24	43.50	44.65	54.00	-9.35	AV
V	10480.059	60.75	8.46	37.68	44.50	62.39	68.20	-5.81	PK
V	10480.059	43.24	8.46	37.68	44.50	44.88	54.00	-9.12	AV
V	15720.124	64.94	10.12	38.80	44.10	69.76	74.00	-4.24	PK
V	15720.124	43.42	10.12	38.80	42.70	49.64	54.00	-4.36	AV
H	4739.060	61.89	7.10	37.24	43.50	62.73	74.00	-11.27	PK
H	4739.060	43.72	7.10	37.24	43.50	44.56	54.00	-9.44	AV
H	10480.059	50.17	8.46	38.57	44.50	52.70	68.20	-15.50	PK
H	10480.059	43.53	8.46	38.57	44.50	46.06	54.00	-7.94	AV
H	15720.075	53.77	10.12	38.38	44.10	58.17	74.00	-15.83	PK
H	15720.075	43.78	10.12	38.38	44.10	48.18	54.00	-5.82	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
The worst case is Antenna A.

Test Mode :	TX(5.1G) - 802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.004	63.55	5.94	35.40	44.00	60.89	68.20	-7.31	PK
V	4434.004	43.24	5.94	35.40	44.00	40.58	54.00	-13.42	AV
V	10360.188	61.28	8.46	39.75	44.50	64.99	68.20	-3.21	PK
V	10360.188	43.06	8.46	39.75	44.50	46.77	54.00	-7.23	AV
V	15540.064	63.52	10.12	38.80	44.10	68.34	74.00	-5.66	PK
V	15540.064	43.87	10.12	38.80	42.70	50.09	54.00	-3.91	AV
H	4434.077	64.39	5.94	35.18	44.00	61.51	68.20	-6.69	PK
H	4434.077	43.25	5.94	35.18	44.00	40.37	54.00	-13.63	AV
H	10360.061	50.58	8.46	38.71	44.50	53.25	68.20	-14.95	PK
H	10360.061	44.28	8.46	38.71	44.50	46.95	54.00	-7.05	AV
H	15540.042	54.85	10.12	38.38	44.10	59.25	74.00	-14.75	PK
H	15540.042	41.52	10.12	38.38	44.10	45.92	54.00	-8.08	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.098	60.30	6.48	36.35	44.05	59.08	74.00	-14.92	PK
V	4592.098	43.79	6.48	36.35	44.05	42.57	54.00	-11.43	AV
V	10400.033	64.40	8.47	37.88	44.51	66.24	68.20	-1.96	PK
V	10400.033	43.09	8.47	37.88	44.51	44.93	54.00	-9.07	AV
V	15600.159	63.62	10.12	38.80	44.10	68.44	74.00	-5.56	PK
V	15600.159	43.47	10.12	38.80	42.70	49.69	54.00	-4.31	AV
H	4592.115	64.70	6.48	36.37	44.05	63.50	74.00	-10.50	PK
H	4592.115	43.44	6.48	36.37	44.05	42.24	54.00	-11.76	AV
H	10400.098	51.19	8.47	38.64	44.50	53.80	68.20	-14.40	PK
H	10400.098	44.42	8.47	38.64	44.50	47.03	54.00	-6.97	AV
H	15600.190	52.27	10.12	38.38	44.10	56.67	74.00	-17.33	PK
H	15600.190	40.06	10.12	38.38	44.10	44.46	54.00	-9.54	AV
High Channel (5240 MHz)-Above 1G									
V	4739.131	64.22	7.10	37.24	43.50	65.06	74.00	-8.94	PK
V	4739.131	43.05	7.10	37.24	43.50	43.89	54.00	-10.11	AV
V	10480.030	63.55	8.46	37.68	44.50	65.19	68.20	-3.01	PK
V	10480.030	43.27	8.46	37.68	44.50	44.91	54.00	-9.09	AV
V	15720.142	62.73	10.12	38.80	44.10	67.55	74.00	-6.45	PK
V	15720.142	43.80	10.12	38.80	42.70	50.02	54.00	-3.98	AV
H	4739.166	62.98	7.10	37.24	43.50	63.82	74.00	-10.18	PK
H	4739.166	43.26	7.10	37.24	43.50	44.10	54.00	-9.90	AV
H	10480.142	54.37	8.46	38.57	44.50	56.90	68.20	-11.30	PK
H	10480.142	43.94	8.46	38.57	44.50	46.47	54.00	-7.53	AV
H	15720.013	51.70	10.12	38.38	44.10	56.10	74.00	-17.90	PK
H	15720.013	44.51	10.12	38.38	44.10	48.91	54.00	-5.09	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
Test Mode is MIMO Mode.

Test Mode :	TX(5.1G) - 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.125	64.70	5.94	35.40	44.00	62.04	74.00	-11.96	PK
V	4434.125	43.01	5.94	35.40	44.00	40.35	54.00	-13.65	AV
V	10380.166	60.16	8.46	39.75	44.50	63.87	68.20	-4.33	PK
V	10380.166	43.75	8.46	39.75	44.50	47.46	54.00	-6.54	AV
V	15570.061	61.06	10.12	38.80	44.10	65.88	74.00	-8.12	PK
V	15570.061	43.61	10.12	38.80	42.70	49.83	54.00	-4.17	AV
H	4434.009	62.87	5.94	35.18	44.00	59.99	74.00	-14.01	PK
H	4434.009	43.00	5.94	35.18	44.00	40.12	54.00	-13.88	AV
H	10380.147	50.61	8.46	38.71	44.50	53.28	68.20	-14.92	PK
H	10380.147	42.63	8.46	38.71	44.50	45.30	54.00	-8.70	AV
H	15570.080	54.70	10.12	38.38	44.10	59.10	74.00	-14.90	PK
H	15570.080	40.64	10.12	38.38	44.10	45.04	54.00	-8.96	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.133	62.91	6.48	36.35	44.05	61.69	74.00	-12.31	PK
V	4739.133	43.65	6.48	36.35	44.05	42.43	54.00	-11.57	AV
V	10460.140	62.66	8.47	37.88	44.51	64.50	68.20	-3.70	PK
V	10460.140	43.15	8.47	37.88	44.51	44.99	54.00	-9.01	AV
V	15690.053	62.65	10.12	38.80	44.10	67.47	74.00	-6.53	PK
V	15690.053	43.56	10.12	38.80	42.70	49.78	54.00	-4.22	AV
H	4739.104	62.21	6.48	36.37	44.05	61.01	74.00	-12.99	PK
H	4739.104	43.16	6.48	36.37	44.05	41.96	54.00	-12.04	AV
H	10460.053	54.08	8.47	38.64	44.50	56.69	68.20	-11.51	PK
H	10460.053	41.44	8.47	38.64	44.50	44.05	54.00	-9.95	AV
H	15690.146	50.43	10.12	38.38	44.10	54.83	74.00	-19.17	PK
H	15690.146	43.60	10.12	38.38	44.10	48.00	54.00	-6.00	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
Test Mode is MIMO Mode.

Test Mode :	TX(5.1G) - 802.11 AC20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5180 MHz)-Above 1G									
V	4434.075	60.90	5.94	35.40	44.00	58.24	68.20	-9.96	PK
V	4434.075	43.54	5.94	35.40	44.00	40.88	54.00	-13.12	AV
V	10360.141	63.31	8.46	39.75	44.50	67.02	74.00	-6.98	PK
V	10360.141	43.10	8.46	39.75	44.50	46.81	54.00	-7.19	AV
V	15540.032	63.10	10.12	38.80	44.10	67.92	74.00	-6.08	PK
V	15540.032	43.11	10.12	38.80	42.70	49.33	54.00	-4.67	AV
H	4434.130	60.01	5.94	35.18	44.00	57.13	68.20	-11.07	PK
H	4434.130	43.77	5.94	35.18	44.00	40.89	54.00	-13.11	AV
H	10360.110	52.29	8.46	38.71	44.50	54.96	74.00	-19.04	PK
H	10360.110	44.84	8.46	38.71	44.50	47.51	54.00	-6.49	AV
H	15540.173	53.88	10.12	38.38	44.10	58.28	74.00	-15.72	PK
H	15540.173	44.83	10.12	38.38	44.10	49.23	54.00	-4.77	AV
middle Channel (5200 MHz)-Above 1G									
V	4592.104	62.18	6.48	36.35	44.05	60.96	74.00	-13.04	PK
V	4592.104	43.34	6.48	36.35	44.05	42.12	54.00	-11.88	AV
V	10400.076	62.24	8.47	37.88	44.51	64.08	68.20	-4.12	PK
V	10400.076	43.98	8.47	37.88	44.51	45.82	54.00	-8.18	AV
V	15600.161	64.35	10.12	38.80	44.10	69.17	74.00	-4.83	PK
V	15600.161	43.09	10.12	38.80	42.70	49.31	54.00	-4.69	AV
H	4592.089	60.08	6.48	36.37	44.05	58.88	74.00	-15.12	PK
H	4592.089	43.61	6.48	36.37	44.05	42.41	54.00	-11.59	AV
H	10400.078	50.40	8.47	38.64	44.50	53.01	68.20	-15.19	PK
H	10400.078	44.05	8.47	38.64	44.50	46.66	54.00	-7.34	AV
H	15600.176	50.42	10.12	38.38	44.10	54.82	74.00	-19.18	PK
H	15600.176	44.17	10.12	38.38	44.10	48.57	54.00	-5.43	AV
High Channel (5240 MHz)-Above 1G									
V	4739.015	64.37	7.10	37.24	43.50	65.21	74.00	-8.79	PK
V	4739.015	43.75	7.10	37.24	43.50	44.59	54.00	-9.41	AV
V	10480.067	60.90	8.46	37.68	44.50	62.54	68.20	-5.66	PK
V	10480.067	43.82	8.46	37.68	44.50	45.46	54.00	-8.54	AV
V	15720.151	61.69	10.12	38.80	44.10	66.51	74.00	-7.49	PK
V	15720.151	43.71	10.12	38.80	42.70	49.93	54.00	-4.07	AV
H	4739.092	60.17	7.10	37.24	43.50	61.01	74.00	-12.99	PK
H	4739.092	43.43	7.10	37.24	43.50	44.27	54.00	-9.73	AV
H	10480.064	51.62	8.46	38.57	44.50	54.15	68.20	-14.05	PK
H	10480.064	43.07	8.46	38.57	44.50	45.60	54.00	-8.40	AV
H	15720.085	51.90	10.12	38.38	44.10	56.30	74.00	-17.70	PK
H	15720.085	41.31	10.12	38.38	44.10	45.71	54.00	-8.29	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
Test Mode is MIMO Mode.

Test Mode :	TX(5.1G) - 802.11 AC40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.139	61.43	5.94	35.40	44.00	58.77	74.00	-15.23	PK
V	4434.139	43.60	5.94	35.40	44.00	40.94	54.00	-13.06	AV
V	10380.115	60.20	8.46	39.75	44.50	63.91	68.20	-4.29	PK
V	10380.115	43.70	8.46	39.75	44.50	47.41	54.00	-6.59	AV
V	15570.108	62.59	10.12	38.80	44.10	67.41	74.00	-6.59	PK
V	15570.108	43.74	10.12	38.80	42.70	49.96	54.00	-4.04	AV
H	4434.176	60.05	5.94	35.18	44.00	57.17	74.00	-16.83	PK
H	4434.176	43.84	5.94	35.18	44.00	40.96	54.00	-13.04	AV
H	10380.004	54.16	8.46	38.71	44.50	56.83	68.20	-11.37	PK
H	10380.004	41.74	8.46	38.71	44.50	44.41	54.00	-9.59	AV
H	15570.106	51.03	10.12	38.38	44.10	55.43	74.00	-18.57	PK
H	15570.106	43.37	10.12	38.38	44.10	47.77	54.00	-6.23	AV
middle Channel (5230 MHz)-Above 1G									
V	4739.083	64.84	6.48	36.35	44.05	63.62	74.00	-10.38	PK
V	4739.083	43.10	6.48	36.35	44.05	41.88	54.00	-12.12	AV
V	10460.021	63.50	8.47	37.88	44.51	65.34	68.20	-2.86	PK
V	10460.021	43.76	8.47	37.88	44.51	45.60	54.00	-8.40	AV
V	15690.160	60.31	10.12	38.80	44.10	65.13	74.00	-8.87	PK
V	15690.160	43.05	10.12	38.80	42.70	49.27	54.00	-4.73	AV
H	4739.134	63.38	6.48	36.37	44.05	62.18	74.00	-11.82	PK
H	4739.134	43.50	6.48	36.37	44.05	42.30	54.00	-11.70	AV
H	10460.124	52.59	8.47	38.64	44.50	55.20	68.20	-13.00	PK
H	10460.124	43.37	8.47	38.64	44.50	45.98	54.00	-8.02	AV
H	15690.112	51.59	10.12	38.38	44.10	55.99	74.00	-18.01	PK
H	15690.112	40.80	10.12	38.38	44.10	45.20	54.00	-8.80	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
Test Mode is MIMO Mode.

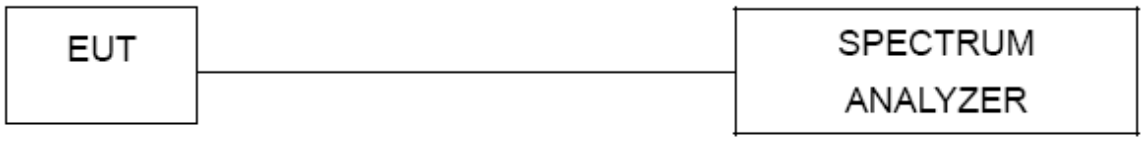
Test Mode :	TX(5.1G) - 802.11 AC80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
(5210 MHz)-Above 1G									
V	4434.095	60.96	5.94	35.40	44.00	58.30	74.00	-15.70	PK
V	4434.095	43.41	5.94	35.40	44.00	40.75	54.00	-13.25	AV
V	10420.176	61.87	8.46	39.75	44.50	65.58	68.20	-2.62	PK
V	10420.176	43.38	8.46	39.75	44.50	47.09	54.00	-6.91	AV
V	15630.047	64.21	10.12	38.80	44.10	69.03	74.00	-4.97	PK
V	15630.047	43.36	10.12	38.80	42.70	49.58	54.00	-4.42	AV
H	4434.141	60.29	5.94	35.18	44.00	57.41	74.00	-16.59	PK
H	4434.141	43.05	5.94	35.18	44.00	40.17	54.00	-13.83	AV
H	10420.033	53.78	8.46	38.71	44.50	56.45	68.20	-11.75	PK
H	10420.033	40.78	8.46	38.71	44.50	43.45	54.00	-10.55	AV
H	15630.034	52.39	10.12	38.38	44.10	56.79	74.00	-17.21	PK
H	15630.034	43.43	10.12	38.38	44.10	47.83	54.00	-6.17	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.
Test Mode is MIMO Mode.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3 Test Procedure

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

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/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 10log(1MHz/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.

.

8.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

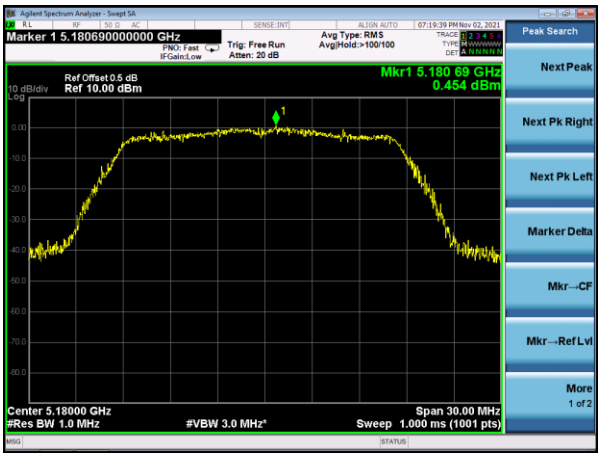
8.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 9V
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Test Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11 a	5180 MHz	2.652	11	PASS
	5200 MHz	1.941	11	PASS
	5240 MHz	2.690	11	PASS
802.11 n20	5180 MHz	0.454	11	PASS
	5200 MHz	-0.451	11	PASS
	5240 MHz	-0.037	11	PASS
802.11 n40	5190 MHz	-1.904	11	PASS
	5230 MHz	-2.160	11	PASS
802.11 AC20	5180 MHz	-0.010	11	PASS
	5200 MHz	0.974	11	PASS
	5240 MHz	-0.267	11	PASS
802.11 AC40	5190 MHz	-1.814	11	PASS
	5230 MHz	-2.087	11	PASS
802.11 AC80	5210 MHz	-1.889	11	PASS

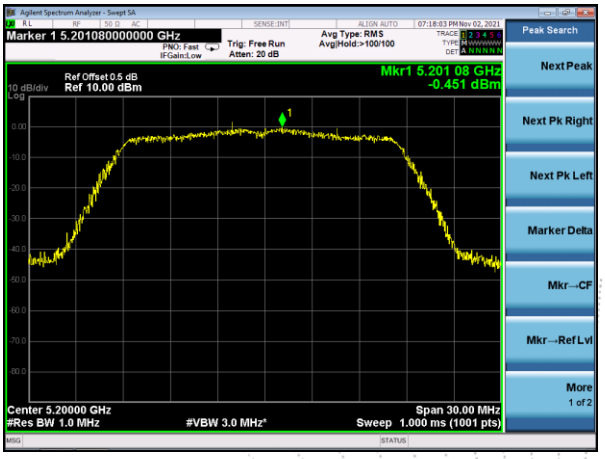
(802.11a) PSD plot on channel 36

(802.11n20) PSD plot on channel 36



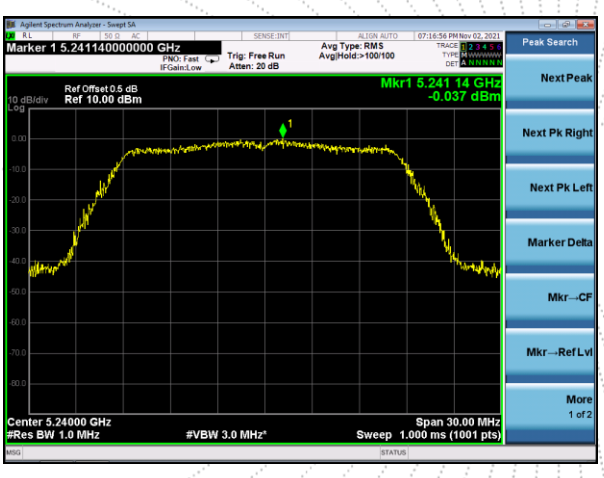
(802.11a) PSD plot on channel 40

(802.11n20) PSD plot on channel 40



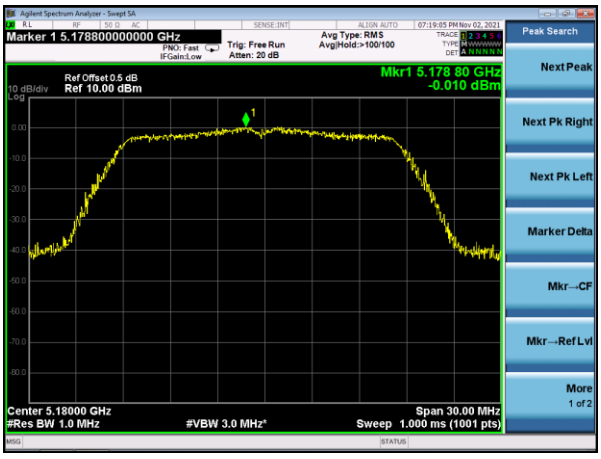
(802.11a) PSD plot on channel 48

(802.11n20) PSD plot on channel 48

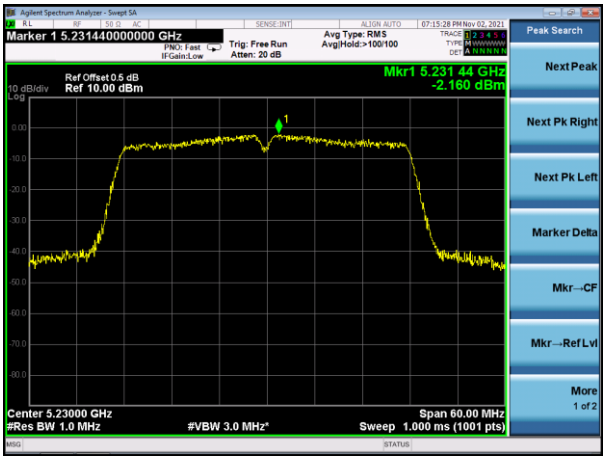


(802.11n40) PSD plot on channel 38

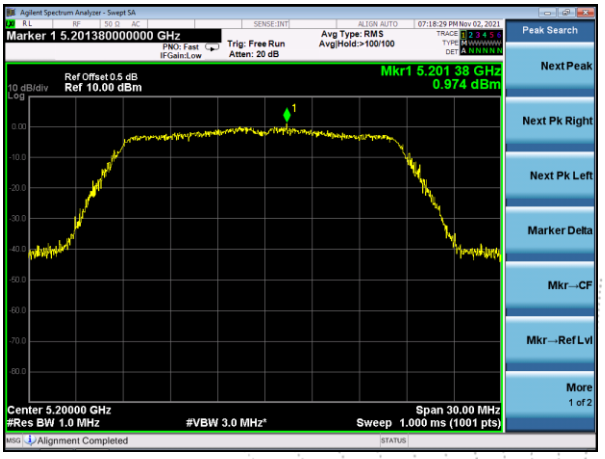
(802.11ac20) PSD plot on channel 36



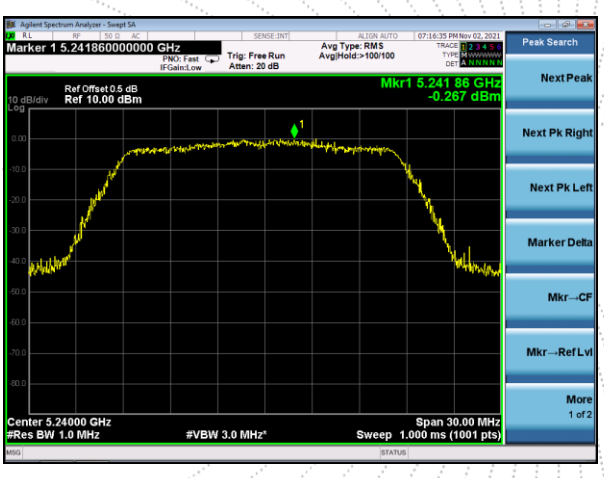
(802.11n40) PSD plot on channel 46



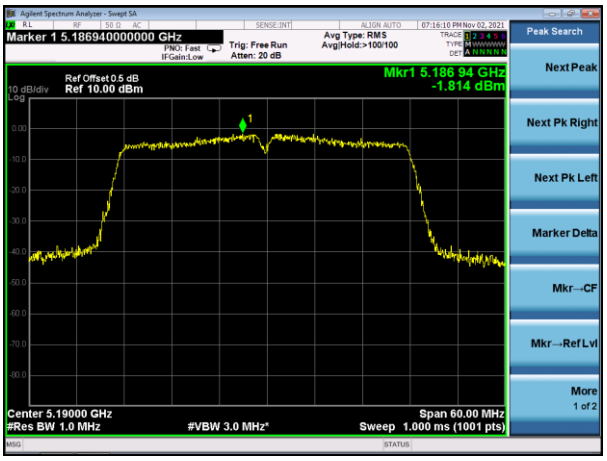
(802.11ac20) PSD plot on channel 40



(802.11ac20) PSD plot on channel 48

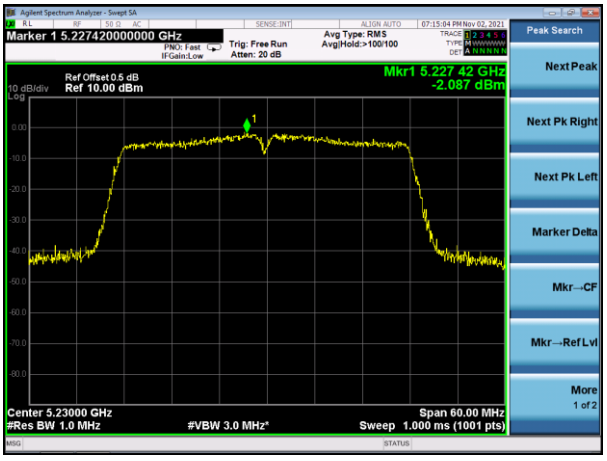


(802.11ac40) PSD plot on channel 38



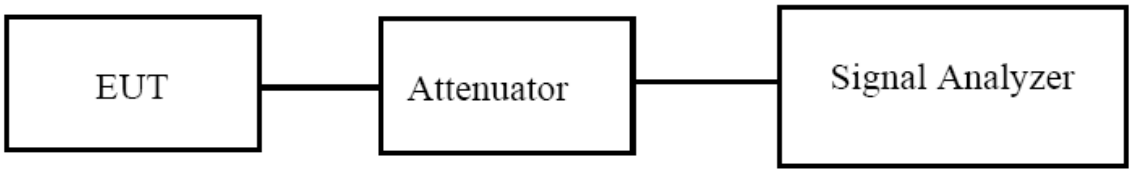
(802.11ac80) PSD plot on channel 42

(802.11ac40) PSD plot on channel 46



9. 26dB & 99% Emission Bandwidth

9.1 Block Diagram Of Test Setup



9.2 Limit

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power
is integrated over the full reference bandwidth.

9.3 Test Procedure

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%.
The following procedure shall be used for measuring (99 %) power bandwidth:

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

9.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

9.5 Test Result

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 9V
Test Mode ：	TX Frequency U-NII-1 (5180-5240MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth(MHz)	Result
802.11a	CH36	5180	16.84	21.36	Pass
	CH40	5200	16.82	20.97	Pass
	CH48	5240	16.80	21.35	Pass
802.11 n20	CH36	5180	17.87	21.31	Pass
	CH40	5200	17.86	21.63	Pass
	CH48	5240	17.86	21.56	Pass
802.11 n40	CH 38	5190	36.29	40.56	Pass
	CH 46	5230	36.32	40.66	Pass
802.11 AC20	CH36	5180	17.93	21.50	Pass
	CH40	5200	17.95	21.56	Pass
	CH48	5240	17.92	21.44	Pass
802.11 AC40	CH 38	5190	36.36	40.53	Pass
	CH 46	5230	36.43	40.79	Pass
802.11 AC80	CH 42	5210	75.39	81.03	Pass