

TEST REPORT

Report No.: BCTC2101076568-3E

Applicant: Shenzhen LinkDroid Technology Co., Limited

Product Name: Receiver, Set-top box, Media player

Model/Type Ref.: A6N MAX

Tested Date: 2021-01-12 to 2021-01-25

Issued Date: 2021-01-26

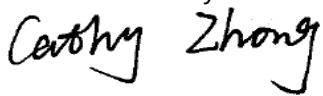
Shenzhen BCTC Testing Co., Ltd.



FCC ID: 2AYPG-A6NMAX

Product Name: Receiver, Set-top box,Media player
Trademark: Amiko, AMIKO
Model/Type Ref.: A6N MAX
Prepared For: Shenzhen LinkDroid Technology Co., Limited
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Sample Received Date: 2021-01-12
Sample tested Date: 2021-01-12 to 2021-01-25
Issue Date: 2021-01-26
Report No.: BCTC2101076568-3E
Test Standards: FCC Part15 15.407
ANSI C63.10-2013
KDB 789033 D02 v02r01
Test Results: PASS

Tested by:



Cathy Zhong/ Project Handler

Approved by:



Zero Zhou/Reviewer

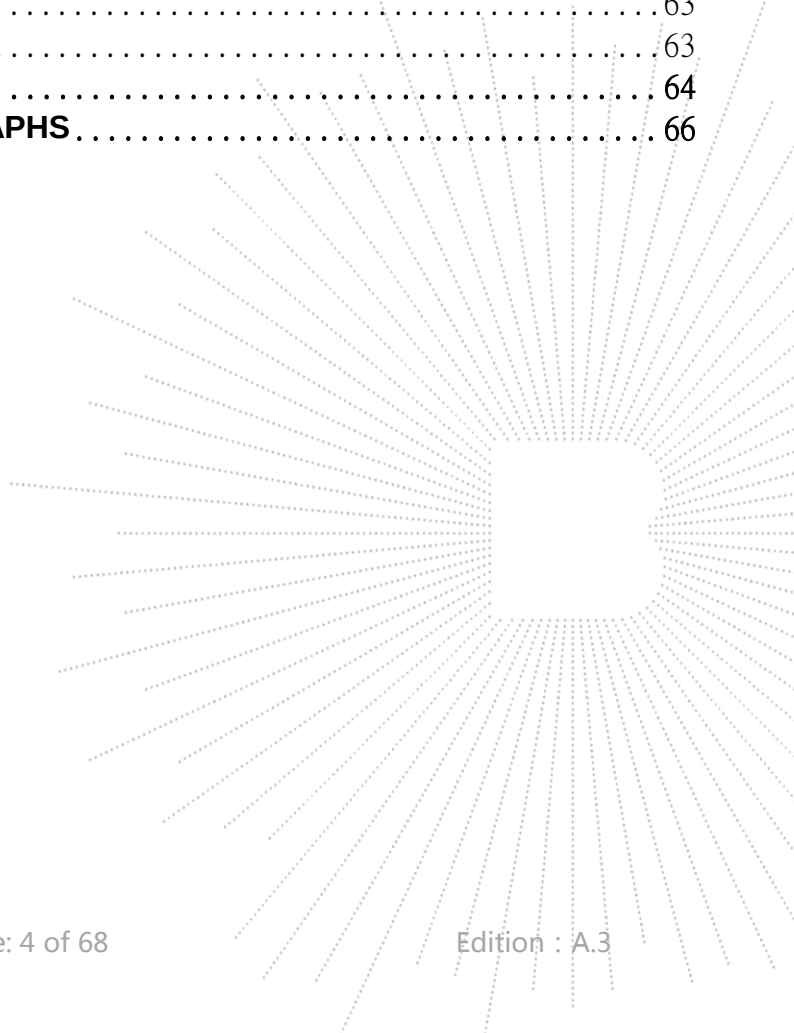
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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
BCTC2101076568-3E	2021-01-26	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	PASS
3	26 dB and 99% Emission Bandwidth	15.407 (a)(5) 15.1049	PASS
4	Maximum Conducted Output Power	15.407 (a)(1) 15.407 (a)(3)	PASS
5	Band Edge	2.1051, 15.407(b)(1) 15.407(b)(4)	PASS
6	Power Spectral Density	15.407 (a)(1) 15.407 (a)(3)	PASS
7	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(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59°C

4. PRODUCT INFORMATION AND TEST SETUP

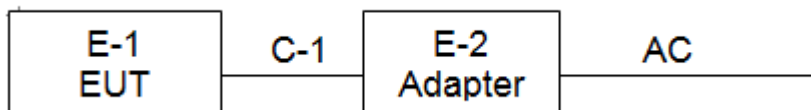
4.1 Product Information

Model/Type Ref.:	A6N MAX
Model differences:	N/A
Hardware Version:	LZ_905X_TX_IR_V1.6
Software Version:	1.0.27
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-MCS
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:	FPCB antenna
Antenna Gain:	2dBi
Ratings:	Input: AC 100-240V 50/60Hz 0.4A Output: 5V 2A
Adapter Information:	Model No.: SA12BV-050200U Input: AC 100-240V 50/60Hz 0.4A Output: 5V 2A

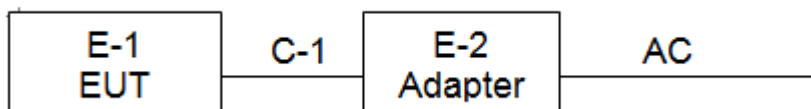
4.2 Test Setup Configuration

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.	Data Cable	Power Cord
E-1	Receiver, Set-top box, Media player	Amiko AMIKO	A6N MAX	N/A	EUT	E-1
E-2	Adapter	N/A	SA12BV-0 50200U	N/A	Auxiliary	E-2

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.8M	DC cable unshielded

Notes:

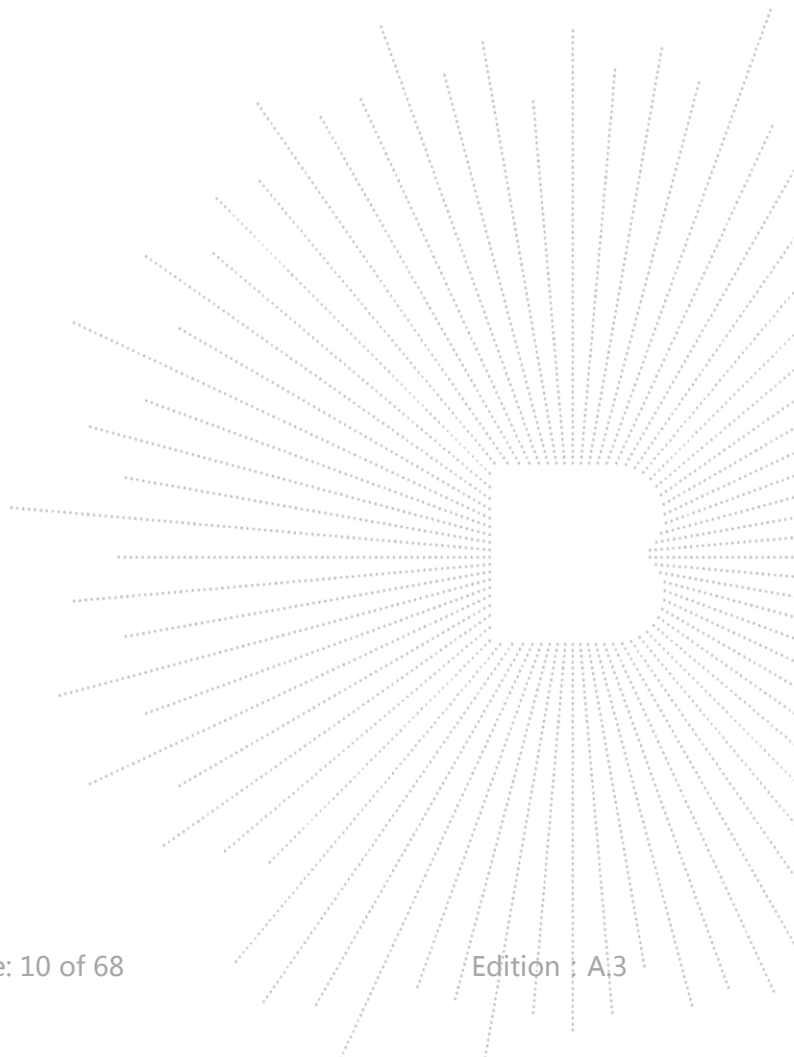
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

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

802.11n /ac(40MHz) Carrier Frequency Channel							
Channel	Frequen cy (MHz)	Channel	Frequen cy (MHz)	Channel	Frequen cy (MHz)	Channel	Frequen cy (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 generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly 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/CH 155
Mode 4	802.11a / n/ ac 20 CH36/ CH40/ CH 48
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	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/CH 155
Mode 4	802.11a / n/ ac 20 CH36/ CH40/ CH 48

Note:

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

4.6 table of parameters of test 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	rftesttool		
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

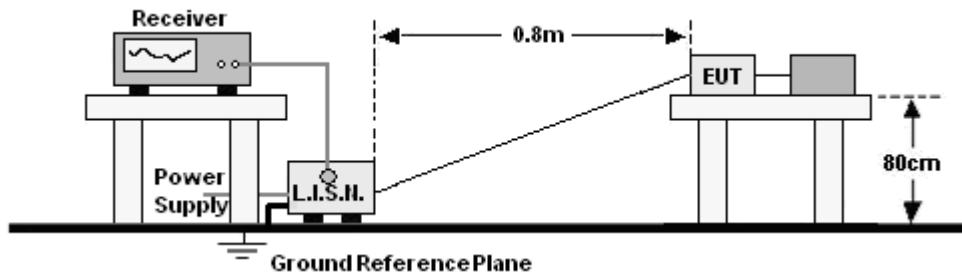
Conducted emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 08, 2020	Jun. 07, 2021
LISN	R&S	ENV216	101375	Jun. 04, 2020	Jun. 03, 2021
ISN	HPX	ISN T800	S1509001	Jun. 04, 2020	Jun. 03, 2021
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

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	Jun. 08, 2020	Jun. 07, 2021
Receiver	R&S	ESRP	101154	Jun. 08, 2020	Jun. 07, 2021
Amplifier	Schwarzbeck	BBV9718	9718-309	Jun. 04, 2020	Jun. 03, 2021
Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 04, 2020	Jun. 03, 2021
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Jun. 08, 2020	Jun. 07, 2021
Horn Antenna	SCHWARZBEC K	BBHA9120 D	1201	Jun. 10, 2020	Jun. 09, 2021
Horn Antenna (18GHz-40GHz)	SCHWARZBEC K	BBHA9170	822	Jun. 10, 2020	Jun. 09, 2021
Amplifier (18GHz-40GHz)	MITEQ	TTA1840-3 5-HG	2034381	Jun. 08, 2020	Jun. 07, 2021
Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519 B	014	Jun. 08, 2020	Jun. 07, 2021
RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MH z	B1702988-0 008	Jun. 08, 2020	Jun. 07, 2021
RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1G Hz	1486150	Jun. 08, 2020	Jun. 07, 2021
RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40G Hz	1607106	Jun. 08, 2020	Jun. 07, 2021
Power Metter	Keysight	E4419B	\	Jun. 08, 2020	Jun. 07, 2021
Power Sensor (AV)	Keysight	E9 300A	\	Jun. 08, 2020	Jun. 07, 2021
Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY4910006 0	Jun. 04, 2020	Jun. 03, 2021
Spectrum Analyzer 9kHz-40GHz	Agilent	FSP40	100363	Jun. 13, 2020	Jun. 12, 2021
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
2	Receiver	R&S	ESR3	102075	Jun. 04, 2020	Jun. 03, 2021
3	Spectrum Analyzer	Agilent	E4407B	MY45109572	Jun. 08, 2020	Jun. 07, 2021
4	Amplifier	Schwarzbeck	BBV9718	9718-309	Jun. 04, 2020	Jun. 03, 2021
5	Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 04, 2020	Jun. 03, 2021
6	TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Jun. 08, 2020	Jun. 07, 2021
7	Horn Antenna	SCHWARZBECK	BBHA9120D	1541	Jun. 10, 2020	Jun. 09, 2021
8	band rejection filter	ZBSF	ZBSF-C2441.5	1706003606	Jun. 13, 2020	Jun. 12, 2021
9	Signal Generator	Keysight	N5181A	MY50143748	Jun. 04, 2020	Jun. 03, 2021
10	Communication test set	R&S	CMU200	119435	Jun. 04, 2020	Jun. 03, 2021
11	Spectrum Analyzer	Keysight	N9020A	MY49100060	Jun. 04, 2020	Jun. 03, 2021
12	Signal Generator	Keysight	N5182B	MY56200519	Jun. 04, 2020	Jun. 03, 2021
13	Power Meter	Keysight	E4419B	\	Jun. 08, 2020	Jun. 07, 2021
14	Power Sensor	Keysight	E9 300A	\	Jun. 08, 2020	Jun. 07, 2021
15	Horn antenna	SCHWARZBECK	BBHA9170	00822	Jun. 10, 2020	Jun. 09, 2021
16	Preamplifier	MITEQ	TTA1840-35-HG	2034381	Jun. 08, 2020	Jun. 07, 2021
17	Software	Frad	EZ-EMC	FA-03A2 RE	\	\
18	Software	Keysight	Keysight.ETSL Test system	1.02.05	\	\
19	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
20	Loop Antenna	Schwarzbeck	FMZB1519B	00014	Jun. 08, 2020	Jun. 07, 2021

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

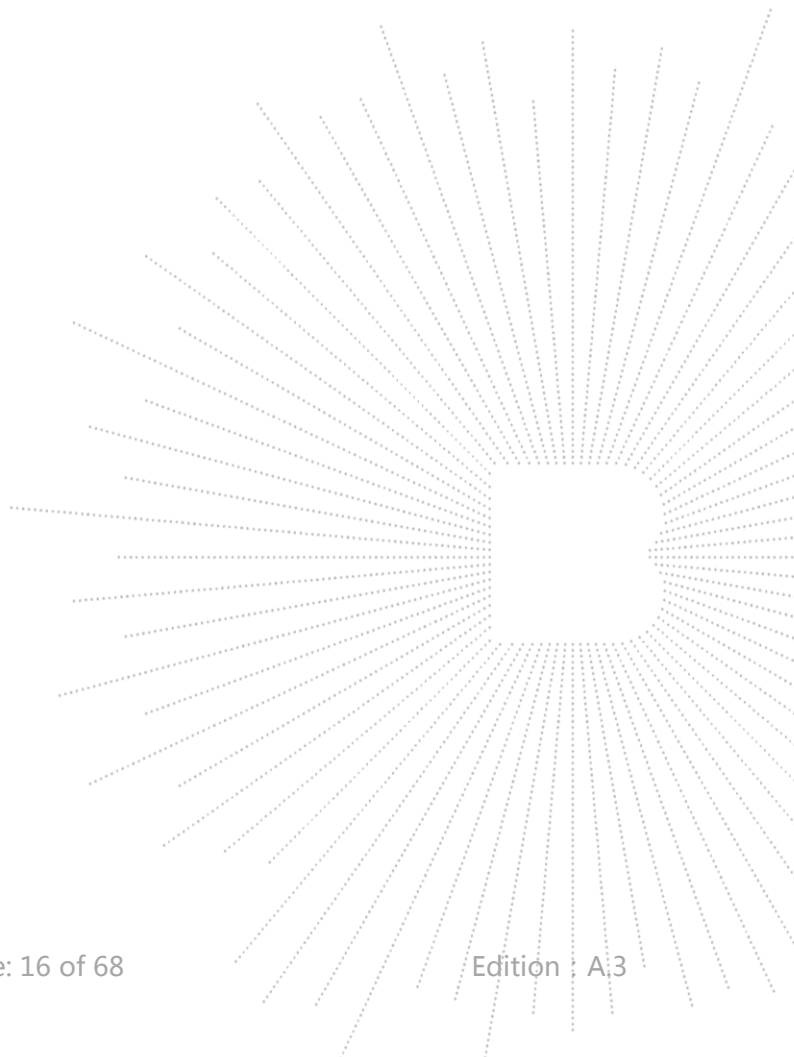
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

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.

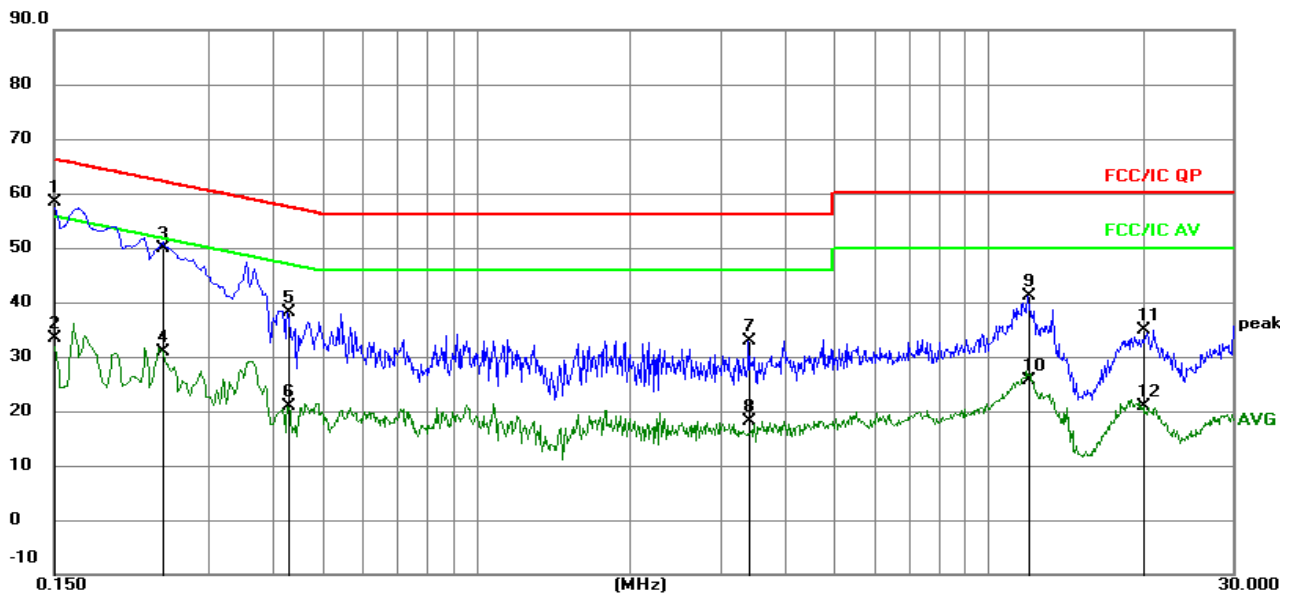
6.4 EUT operating Conditions

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 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4

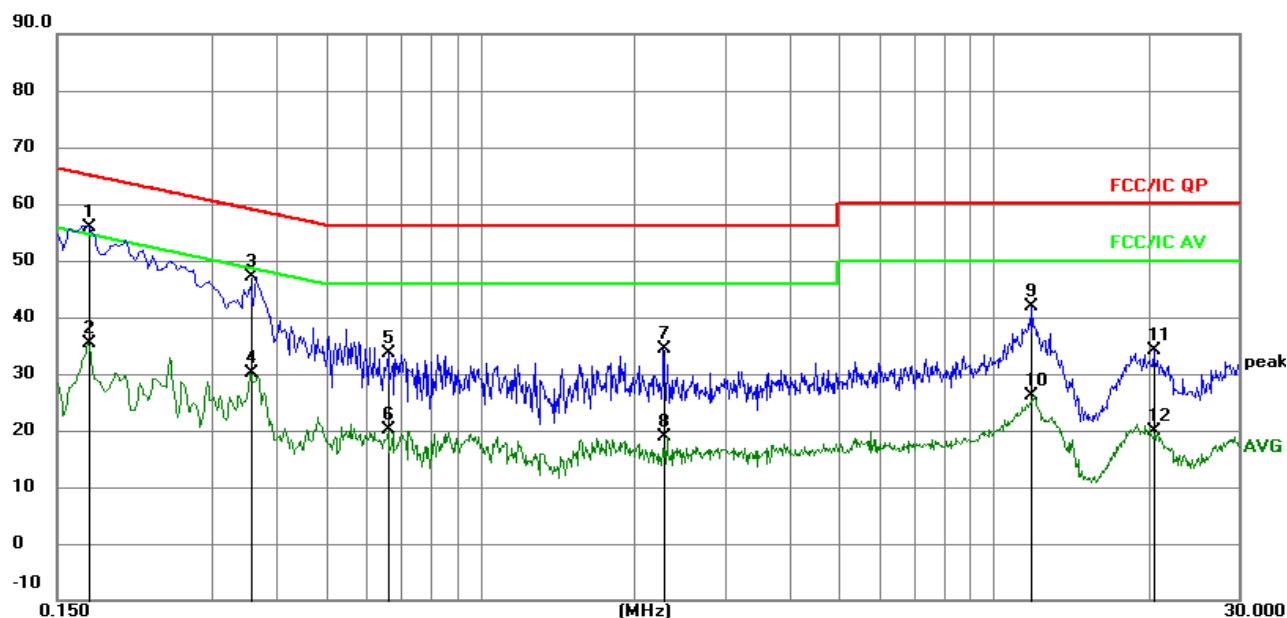


Remark:

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

No.	Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1500	48.92	9.52	58.44	66.00	-7.56	QP
2		0.1500	23.93	9.52	33.45	56.00	-22.55	AVG
3		0.2445	40.26	9.51	49.77	61.94	-12.17	QP
4		0.2445	21.26	9.51	30.77	51.94	-21.17	AVG
5		0.4290	28.71	9.53	38.24	57.27	-19.03	QP
6		0.4290	11.41	9.53	20.94	47.27	-26.33	AVG
7		3.4035	23.28	9.69	32.97	56.00	-23.03	QP
8		3.4035	8.32	9.69	18.01	46.00	-27.99	AVG
9		11.9580	31.34	9.69	41.03	60.00	-18.97	QP
10		11.9580	15.93	9.69	25.62	50.00	-24.38	AVG
11		20.1435	25.19	9.79	34.98	60.00	-25.02	QP
12		20.1435	11.18	9.79	20.97	50.00	-29.03	AVG

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 4



Remark:

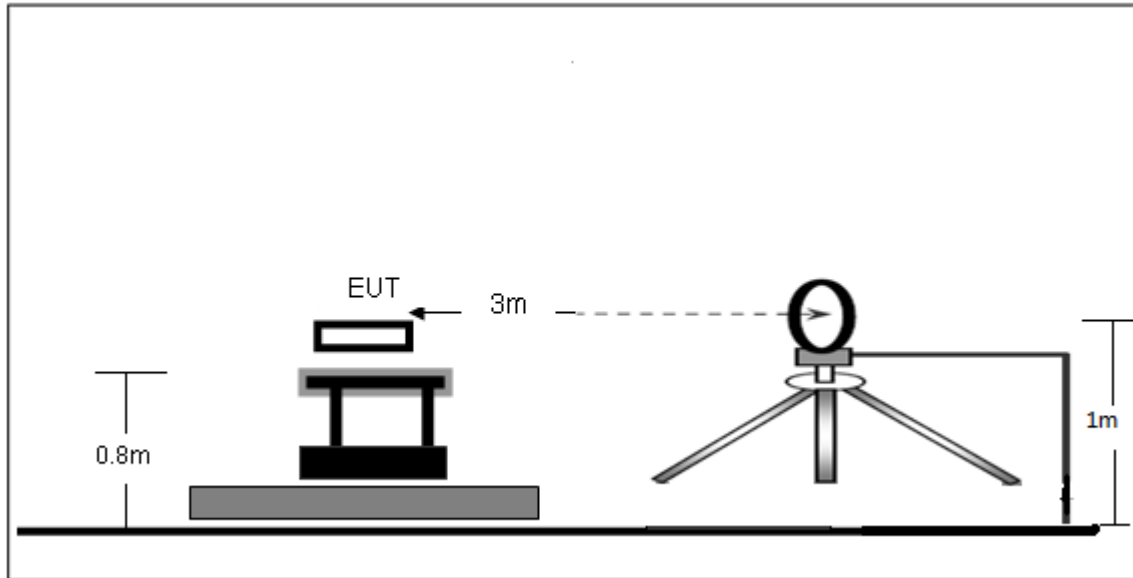
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1722	46.27	9.49	55.76	64.85	-9.09	QP
2		0.1722	25.81	9.49	35.30	54.85	-19.55	AVG
3		0.3558	37.47	9.54	47.01	58.83	-11.82	QP
4		0.3558	20.51	9.54	30.05	48.83	-18.78	AVG
5		0.6613	23.85	9.78	33.63	56.00	-22.37	QP
6		0.6613	10.32	9.78	20.10	46.00	-25.90	AVG
7		2.2726	24.82	9.61	34.43	56.00	-21.57	QP
8		2.2726	9.32	9.61	18.93	46.00	-27.07	AVG
9		11.8697	32.20	9.69	41.89	60.00	-18.11	QP
10		11.8697	16.47	9.69	26.16	50.00	-23.84	AVG
11		20.4854	24.33	9.79	34.12	60.00	-25.88	QP
12		20.4854	10.02	9.79	19.81	50.00	-30.19	AVG

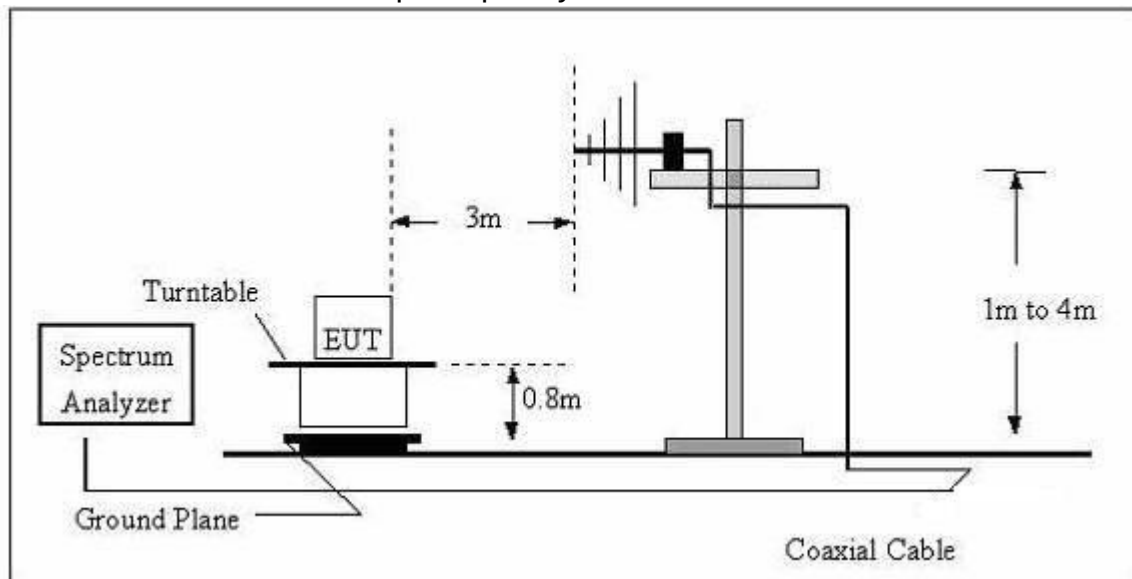
7. RADIATED EMISSIONS

7.1 Block Diagram Of Test Setup

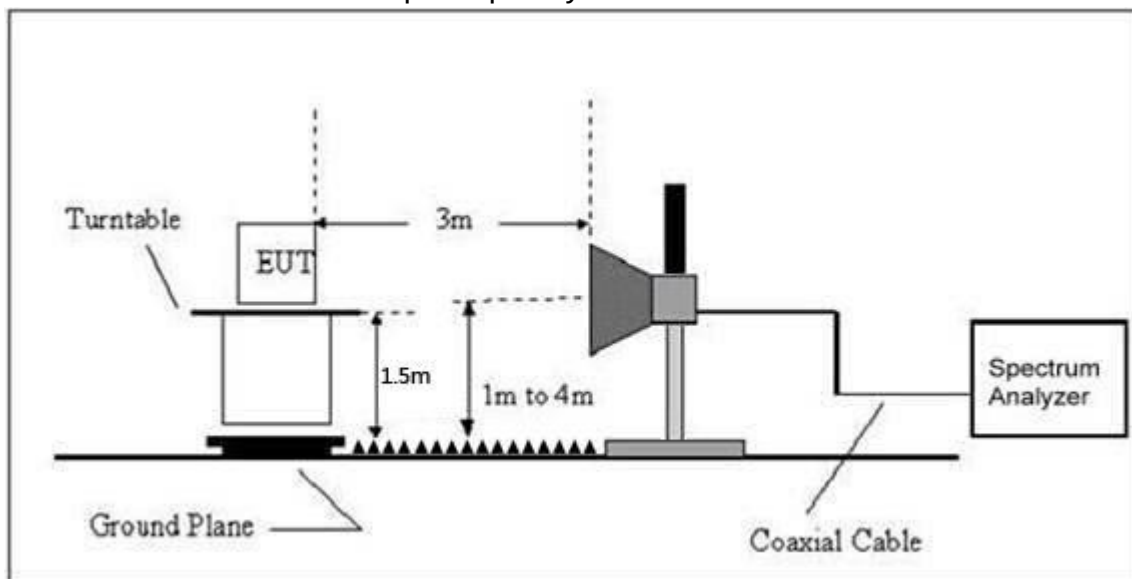
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
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. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for
 - b. above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation. 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.
 - c. The initial step in collecting conducted emission data is a spectrum analyzer peak
 - d. detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode
 - e. 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

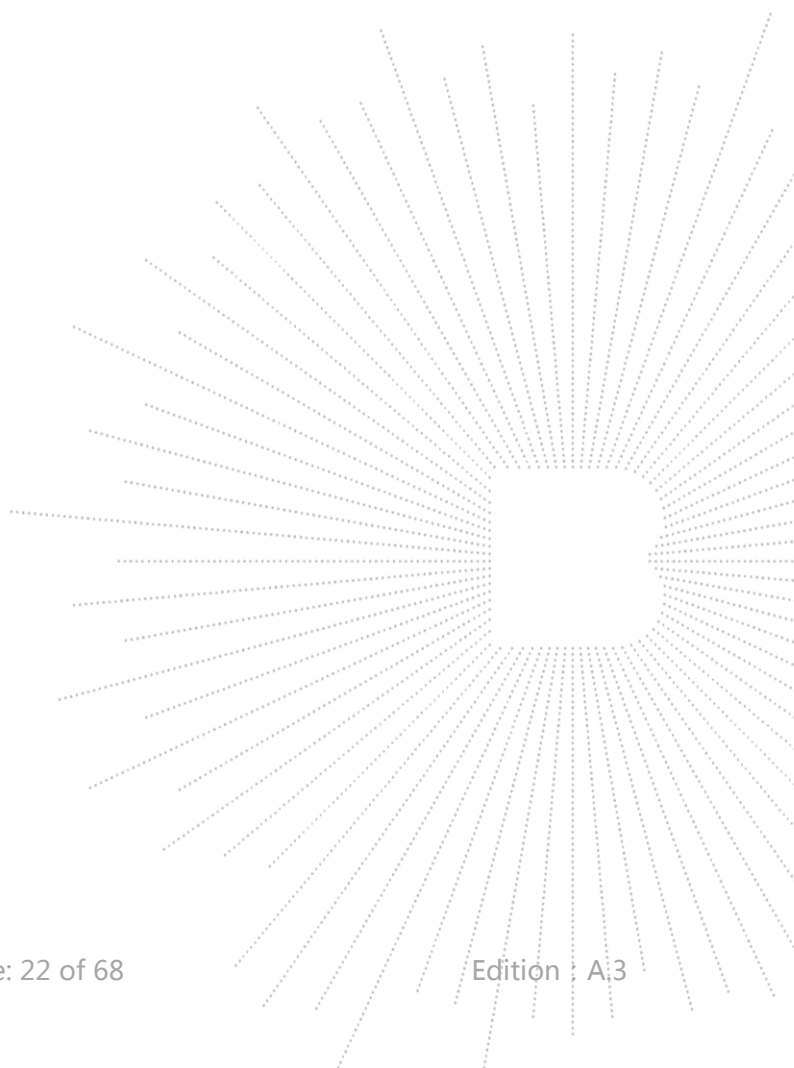
During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

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 $RBWCF [dB] = 10 \cdot \lg(100 [kHz] / \text{narrower RBW} [kHz])$. , 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°C	Relative Humidity:	54%
Pressure:	101 kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 4	Polarization :	--

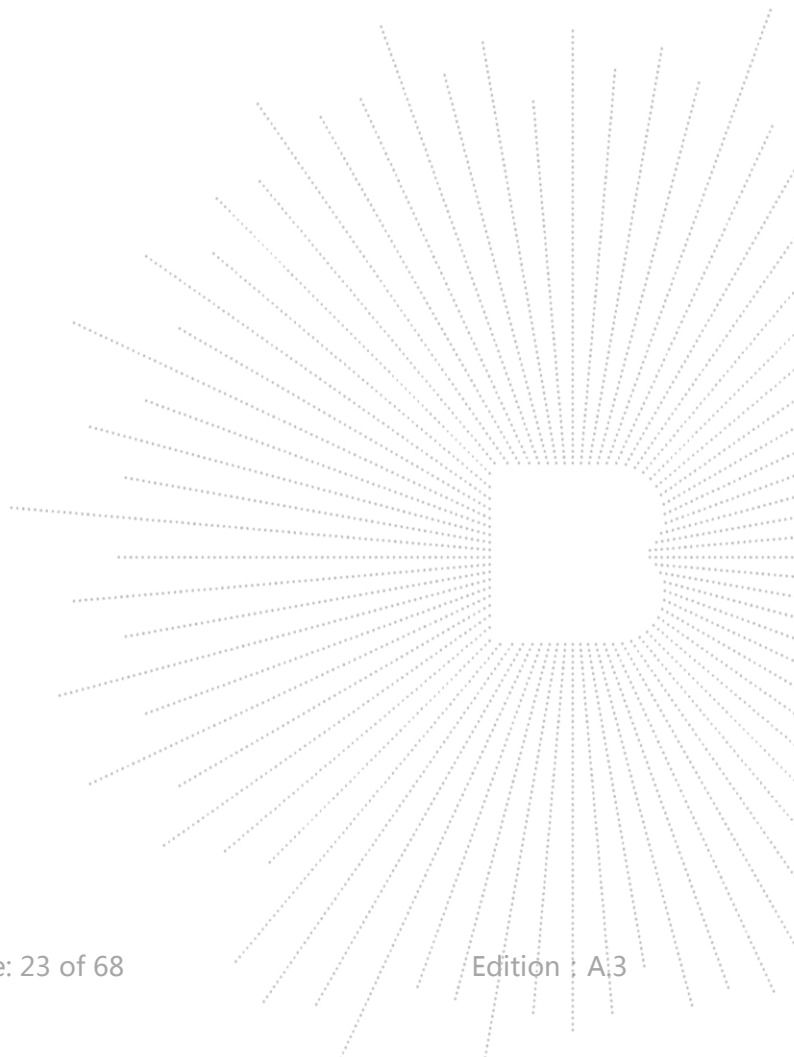
Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

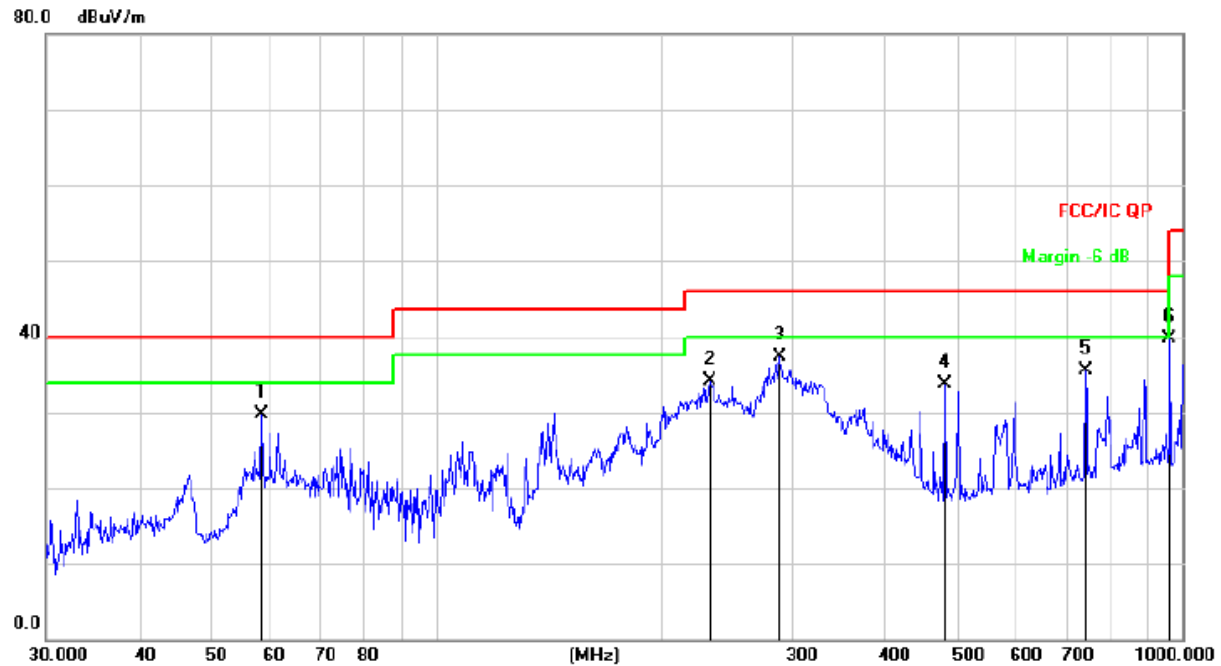
Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



Between 30MHz – 1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 4	Polarization :	Horizontal

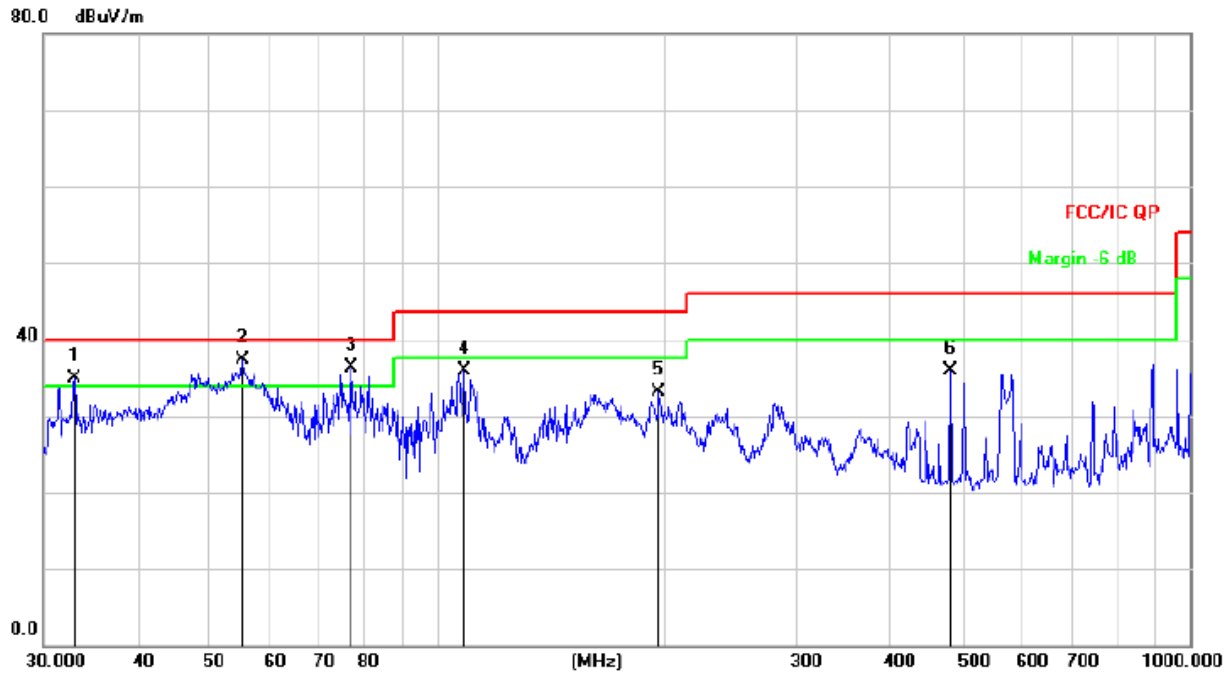


Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		58.4074	44.32	-14.57	29.75	40.00	-10.25	QP
2		232.5318	48.67	-14.59	34.08	46.00	-11.92	QP
3	*	289.0021	50.03	-12.80	37.23	46.00	-8.77	QP
4		480.5276	41.65	-7.98	33.67	46.00	-12.33	QP
5		742.2587	38.38	-2.93	35.45	46.00	-10.55	QP
6		962.1623	40.40	-0.66	39.74	54.00	-14.26	QP

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kpa	Test Voltage :	AC 120V/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	!	32.9791	50.58	-15.76	34.82	40.00	-5.18	QP
2	*	55.2207	51.61	-14.38	37.23	40.00	-2.77	QP
3	!	77.0505	55.08	-18.84	36.24	40.00	-3.76	QP
4		108.6470	52.01	-16.03	35.98	43.50	-7.52	QP
5		197.2001	48.50	-15.45	33.05	43.50	-10.45	QP
6		480.5276	43.87	-7.98	35.89	46.00	-10.11	QP

Between 1GHz – 40GHz

Test Mode :	TX(5.1G) - 802.11a
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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	4434.034	64.67	5.94	35.40	44.00	62.01	68.20	-6.19	PK
V	4434.034	43.52	5.94	35.40	44.00	40.86	54.00	-13.14	AV
V	10360.082	60.57	8.46	39.75	44.50	64.28	74.00	-9.72	PK
V	10360.082	43.93	8.46	39.75	44.50	47.64	54.00	-6.36	AV
V	15540.071	64.04	10.12	38.80	44.10	68.86	74.00	-5.14	PK
V	15540.071	43.23	10.12	38.80	42.70	49.45	54.00	-4.55	AV
H	4434.121	62.42	5.94	35.18	44.00	59.54	68.20	-8.66	PK
H	4434.121	43.61	5.94	35.18	44.00	40.73	54.00	-13.27	AV
H	10360.184	51.66	8.46	38.71	44.50	54.33	74.00	-19.67	PK
H	10360.184	41.10	8.46	38.71	44.50	43.77	54.00	-10.23	AV
H	15540.097	54.85	10.12	38.38	44.10	59.25	74.00	-14.75	PK
H	15540.097	44.91	10.12	38.38	44.10	49.31	54.00	-4.69	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.027	63.92	6.48	36.35	44.05	62.70	74.00	-11.30	PK
V	4592.027	43.03	6.48	36.35	44.05	41.81	54.00	-12.19	AV
V	10400.110	64.56	8.47	37.88	44.51	66.40	68.20	-1.80	PK
V	10400.110	43.35	8.47	37.88	44.51	45.19	54.00	-8.81	AV
V	15600.077	61.90	10.12	38.80	44.10	66.72	74.00	-7.28	PK
V	15600.077	43.05	10.12	38.80	42.70	49.27	54.00	-4.73	AV
H	4592.139	64.09	6.48	36.37	44.05	62.89	74.00	-11.11	PK
H	4592.139	43.49	6.48	36.37	44.05	42.29	54.00	-11.71	AV
H	10400.170	51.07	8.47	38.64	44.50	53.68	68.20	-14.52	PK
H	10400.170	43.97	8.47	38.64	44.50	46.58	54.00	-7.42	AV
H	15600.157	53.74	10.12	38.38	44.10	58.14	74.00	-15.86	PK
H	15600.157	43.27	10.12	38.38	44.10	47.67	54.00	-6.33	AV
High Channel (5240 MHz)-Above 1G									
V	4739.178	62.98	7.10	37.24	43.50	63.82	74.00	-10.18	PK
V	4739.178	43.65	7.10	37.24	43.50	44.49	54.00	-9.51	AV
V	10480.077	63.25	8.46	37.68	44.50	64.89	68.20	-3.31	PK
V	10480.077	43.21	8.46	37.68	44.50	44.85	54.00	-9.15	AV
V	15720.131	63.64	10.12	38.80	44.10	68.46	74.00	-5.54	PK
V	15720.131	43.10	10.12	38.80	42.70	49.32	54.00	-4.68	AV
H	4739.129	64.40	7.10	37.24	43.50	65.24	74.00	-8.76	PK
H	4739.129	43.73	7.10	37.24	43.50	44.57	54.00	-9.43	AV
H	10480.158	51.10	8.46	38.57	44.50	53.63	68.20	-14.57	PK
H	10480.158	41.13	8.46	38.57	44.50	43.66	54.00	-10.34	AV
H	15720.126	50.78	10.12	38.38	44.10	55.18	74.00	-18.82	PK
H	15720.126	41.59	10.12	38.38	44.10	45.99	54.00	-8.01	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 : TX(5.1G) - 802.11n-HT20

Polar (H/V)	Frequency	Meter Reading	Cable loss	Antenn a Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
V	4434.170	64.74	5.94	35.40	44.00	62.08	68.20	-6.12	PK
V	4434.170	43.41	5.94	35.40	44.00	40.75	54.00	-13.25	AV
V	10360.183	63.98	8.46	39.75	44.50	67.69	68.20	-0.51	PK
V	10360.183	43.80	8.46	39.75	44.50	47.51	54.00	-6.49	AV
V	15540.040	63.65	10.12	38.80	44.10	68.47	74.00	-5.53	PK
V	15540.040	43.26	10.12	38.80	42.70	49.48	54.00	-4.52	AV
H	4434.113	64.55	5.94	35.18	44.00	61.67	68.20	-6.53	PK
H	4434.113	43.95	5.94	35.18	44.00	41.07	54.00	-12.93	AV
H	10360.052	53.76	8.46	38.71	44.50	56.43	68.20	-11.77	PK
H	10360.052	41.62	8.46	38.71	44.50	44.29	54.00	-9.71	AV
H	15540.164	52.36	10.12	38.38	44.10	56.76	74.00	-17.24	PK
H	15540.164	42.87	10.12	38.38	44.10	47.27	54.00	-6.73	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.099	64.09	6.48	36.35	44.05	62.87	74.00	-11.13	PK
V	4592.099	43.61	6.48	36.35	44.05	42.39	54.00	-11.61	AV
V	10400.182	60.75	8.47	37.88	44.51	62.59	68.20	-5.61	PK
V	10400.182	43.83	8.47	37.88	44.51	45.67	54.00	-8.33	AV
V	15600.037	64.53	10.12	38.80	44.10	69.35	74.00	-4.65	PK
V	15600.037	43.58	10.12	38.80	42.70	49.80	54.00	-4.20	AV
H	4592.107	62.58	6.48	36.37	44.05	61.38	74.00	-12.62	PK
H	4592.107	43.25	6.48	36.37	44.05	42.05	54.00	-11.95	AV
H	10400.128	52.57	8.47	38.64	44.50	55.18	68.20	-13.02	PK
H	10400.128	44.26	8.47	38.64	44.50	46.87	54.00	-7.13	AV
H	15600.190	50.23	10.12	38.38	44.10	54.63	74.00	-19.37	PK
H	15600.190	42.11	10.12	38.38	44.10	46.51	54.00	-7.49	AV
High Channel (5240 MHz)-Above 1G									
V	4739.124	64.88	7.10	37.24	43.50	65.72	74.00	-8.28	PK
V	4739.124	43.87	7.10	37.24	43.50	44.71	54.00	-9.29	AV
V	10480.009	62.17	8.46	37.68	44.50	63.81	68.20	-4.39	PK
V	10480.009	43.55	8.46	37.68	44.50	45.19	54.00	-8.81	AV
V	15720.102	62.70	10.12	38.80	44.10	67.52	74.00	-6.48	PK
V	15720.102	43.66	10.12	38.80	42.70	49.88	54.00	-4.12	AV
H	4739.008	61.89	7.10	37.24	43.50	62.73	74.00	-11.27	PK
H	4739.008	43.33	7.10	37.24	43.50	44.17	54.00	-9.83	AV
H	10480.118	53.78	8.46	38.57	44.50	56.31	68.20	-11.89	PK
H	10480.118	43.69	8.46	38.57	44.50	46.22	54.00	-7.78	AV
H	15720.051	54.34	10.12	38.38	44.10	58.74	74.00	-15.26	PK
H	15720.051	40.31	10.12	38.38	44.10	44.71	54.00	-9.29	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 :	TX(5.1G) - 802.11n-HT40
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Polar (H/V)	Frequency (MHz)	Meter Reading (dBUV)	Cable loss (dB)	Antenn a Factor dB/m	Preamp Factor (dB)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.008	64.63	5.94	35.40	44.00	61.97	74.00	-12.03	PK
V	4434.008	43.75	5.94	35.40	44.00	41.09	54.00	-12.91	AV
V	10380.088	63.84	8.46	39.75	44.50	67.55	68.20	-0.65	PK
V	10380.088	43.40	8.46	39.75	44.50	47.11	54.00	-6.89	AV
V	15570.144	61.00	10.12	38.80	44.10	65.82	74.00	-8.18	PK
V	15570.144	43.41	10.12	38.80	42.70	49.63	54.00	-4.37	AV
H	4434.015	63.66	5.94	35.18	44.00	60.78	74.00	-13.22	PK
H	4434.015	43.57	5.94	35.18	44.00	40.69	54.00	-13.31	AV
H	10380.098	52.12	8.46	38.71	44.50	54.79	68.20	-13.41	PK
H	10380.098	43.54	8.46	38.71	44.50	46.21	54.00	-7.79	AV
H	15570.123	52.64	10.12	38.38	44.10	57.04	74.00	-16.96	PK
H	15570.123	43.63	10.12	38.38	44.10	48.03	54.00	-5.97	AV
Middle Channel (5230 MHz)-Above 1G									
V	4739.022	63.78	6.48	36.35	44.05	62.56	74.00	-11.44	PK
V	4739.022	43.81	6.48	36.35	44.05	42.59	54.00	-11.41	AV
V	10460.047	61.81	8.47	37.88	44.51	63.65	68.20	-4.55	PK
V	10460.047	43.71	8.47	37.88	44.51	45.55	54.00	-8.45	AV
V	15690.128	60.50	10.12	38.80	44.10	65.32	74.00	-8.68	PK
V	15690.128	43.27	10.12	38.80	42.70	49.49	54.00	-4.51	AV
H	4739.127	61.99	6.48	36.37	44.05	60.79	74.00	-13.21	PK
H	4739.127	43.27	6.48	36.37	44.05	42.07	54.00	-11.93	AV
H	10460.006	51.28	8.47	38.64	44.50	53.89	68.20	-14.31	PK
H	10460.006	40.81	8.47	38.64	44.50	43.42	54.00	-10.58	AV
H	15690.078	53.05	10.12	38.38	44.10	57.45	74.00	-16.55	PK
H	15690.078	43.15	10.12	38.38	44.10	47.55	54.00	-6.45	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 :	TX(5.1G) - 802.11 AC20
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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	4434.096	60.86	5.94	35.40	44.00	58.20	68.20	-10.00	PK
V	4434.096	43.17	5.94	35.40	44.00	40.51	54.00	-13.49	AV
V	10360.114	62.87	8.46	39.75	44.50	66.58	68.20	-1.62	PK
V	10360.114	43.20	8.46	39.75	44.50	46.91	54.00	-7.09	AV
V	15540.069	62.74	10.12	38.80	44.10	67.56	74.00	-6.44	PK
V	15540.069	43.52	10.12	38.80	42.70	49.74	54.00	-4.26	AV
H	4434.111	62.03	5.94	35.18	44.00	59.15	68.20	-9.05	PK
H	4434.111	43.46	5.94	35.18	44.00	40.58	54.00	-13.42	AV
H	10360.153	51.48	8.46	38.71	44.50	54.15	68.20	-14.05	PK
H	10360.153	41.85	8.46	38.71	44.50	44.52	54.00	-9.48	AV
H	15540.173	51.24	10.12	38.38	44.10	55.64	74.00	-18.36	PK
H	15540.173	41.70	10.12	38.38	44.10	46.10	54.00	-7.90	AV
Middle Channel (5200 MHz)-Above 1G									
V	4592.002	61.26	6.48	36.35	44.05	60.04	74.00	-13.96	PK
V	4592.002	43.19	6.48	36.35	44.05	41.97	54.00	-12.03	AV
V	10400.043	62.48	8.47	37.88	44.51	64.32	68.20	-3.88	PK
V	10400.043	43.01	8.47	37.88	44.51	44.85	54.00	-9.15	AV
V	15600.007	61.91	10.12	38.80	44.10	66.73	74.00	-7.27	PK
V	15600.007	43.50	10.12	38.80	42.70	49.72	54.00	-4.28	AV
H	4592.168	61.86	6.48	36.37	44.05	60.66	74.00	-13.34	PK
H	4592.168	43.36	6.48	36.37	44.05	42.16	54.00	-11.84	AV
H	10400.123	54.76	8.47	38.64	44.50	57.37	68.20	-10.83	PK
H	10400.123	43.25	8.47	38.64	44.50	45.86	54.00	-8.14	AV
H	15600.143	52.55	10.12	38.38	44.10	56.95	74.00	-17.05	PK
H	15600.143	40.21	10.12	38.38	44.10	44.61	54.00	-9.39	AV
High Channel (5240 MHz)-Above 1G									
V	4739.006	61.86	7.10	37.24	43.50	62.70	74.00	-11.30	PK
V	4739.006	43.16	7.10	37.24	43.50	44.00	54.00	-10.00	AV
V	10480.024	62.69	8.46	37.68	44.50	64.33	68.20	-3.87	PK
V	10480.024	43.11	8.46	37.68	44.50	44.75	54.00	-9.25	AV
V	15720.095	61.36	10.12	38.80	44.10	66.18	74.00	-7.82	PK
V	15720.095	43.21	10.12	38.80	42.70	49.43	54.00	-4.57	AV
H	4739.099	64.86	7.10	37.24	43.50	65.70	74.00	-8.30	PK
H	4739.099	43.63	7.10	37.24	43.50	44.47	54.00	-9.53	AV
H	10480.183	50.74	8.46	38.57	44.50	53.27	68.20	-14.93	PK
H	10480.183	42.83	8.46	38.57	44.50	45.36	54.00	-8.64	AV
H	15720.012	52.88	10.12	38.38	44.10	57.28	74.00	-16.72	PK
H	15720.012	44.49	10.12	38.38	44.10	48.89	54.00	-5.11	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 :	TX(5.1G) - 802.11 AC40
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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenn a Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5190 MHz)-Above 1G									
V	4434.174	64.25	5.94	35.40	44.00	61.59	74.00	-12.41	PK
V	4434.174	43.62	5.94	35.40	44.00	40.96	54.00	-13.04	AV
V	10380.114	61.16	8.46	39.75	44.50	64.87	68.20	-3.33	PK
V	10380.114	43.81	8.46	39.75	44.50	47.52	54.00	-6.48	AV
V	15570.173	62.50	10.12	38.80	44.10	67.32	74.00	-6.68	PK
V	15570.173	43.11	10.12	38.80	42.70	49.33	54.00	-4.67	AV
H	4434.134	63.91	5.94	35.18	44.00	61.03	74.00	-12.97	PK
H	4434.134	43.71	5.94	35.18	44.00	40.83	54.00	-13.17	AV
H	10380.037	50.48	8.46	38.71	44.50	53.15	68.20	-15.05	PK
H	10380.037	43.42	8.46	38.71	44.50	46.09	54.00	-7.91	AV
H	15570.118	50.56	10.12	38.38	44.10	54.96	74.00	-19.04	PK
H	15570.118	43.15	10.12	38.38	44.10	47.55	54.00	-6.45	AV
Middle Channel (5230 MHz)-Above 1G									
V	4739.031	61.87	6.48	36.35	44.05	60.65	74.00	-13.35	PK
V	4739.031	43.47	6.48	36.35	44.05	42.25	54.00	-11.75	AV
V	10460.198	63.40	8.47	37.88	44.51	65.24	68.20	-2.96	PK
V	10460.198	43.08	8.47	37.88	44.51	44.92	54.00	-9.08	AV
V	15690.048	63.37	10.12	38.80	44.10	68.19	74.00	-5.81	PK
V	15690.048	43.50	10.12	38.80	42.70	49.72	54.00	-4.28	AV
H	4739.165	63.88	6.48	36.37	44.05	62.68	74.00	-11.32	PK
H	4739.165	43.81	6.48	36.37	44.05	42.61	54.00	-11.39	AV
H	10460.190	54.23	8.47	38.64	44.50	56.84	68.20	-11.36	PK
H	10460.190	41.92	8.47	38.64	44.50	44.53	54.00	-9.47	AV
H	15690.085	53.45	10.12	38.38	44.10	57.85	74.00	-16.15	PK
H	15690.085	41.83	10.12	38.38	44.10	46.23	54.00	-7.77	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 :	TX(5.1G) - 802.11 AC80
-------------	------------------------

Polar (H/V)	Frequency (MHz)	Meter Reading (dBUV)	Cable loss (dB)	Antenn a Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Detector Type
(5210 MHz)-Above 1G									
V	4434.067	60.97	5.94	35.40	44.00	58.31	74.00	-15.69	PK
V	4434.067	43.56	5.94	35.40	44.00	40.90	54.00	-13.10	AV
V	10420.197	60.95	8.46	39.75	44.50	64.66	68.20	-3.54	PK
V	10420.197	43.05	8.46	39.75	44.50	46.76	54.00	-7.24	AV
V	15630.083	61.17	10.12	38.80	44.10	65.99	74.00	-8.01	PK
V	15630.083	43.98	10.12	38.80	42.70	50.20	54.00	-3.80	AV
H	4434.076	60.35	5.94	35.18	44.00	57.47	74.00	-16.53	PK
H	4434.076	43.81	5.94	35.18	44.00	40.93	54.00	-13.07	AV
H	10420.102	52.41	8.46	38.71	44.50	55.08	68.20	-13.12	PK
H	10420.102	40.23	8.46	38.71	44.50	42.90	54.00	-11.10	AV
H	15630.129	53.90	10.12	38.38	44.10	58.30	74.00	-15.70	PK
H	15630.129	41.16	10.12	38.38	44.10	45.56	54.00	-8.44	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.

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.

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 $RBW \geq 1/T$, 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.

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

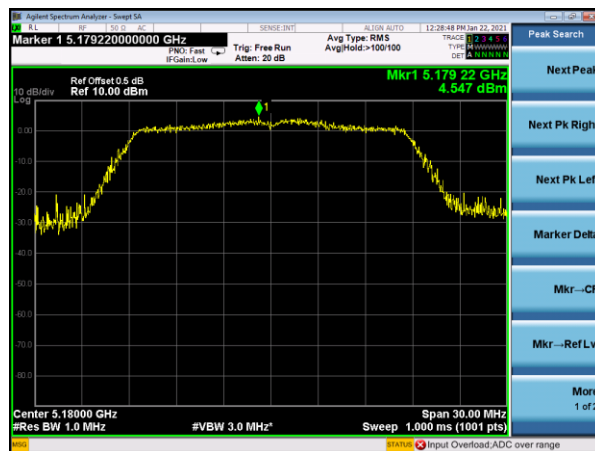
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11 a	5180 MHz	5.481	11	PASS
	5200 MHz	4.840	11	PASS
	5240 MHz	4.261	11	PASS
802.11 n20	5180 MHz	4.547	11	PASS
	5200 MHz	3.931	11	PASS
	5240 MHz	2.889	11	PASS
802.11 n40	5190 MHz	2.115	11	PASS
	5230 MHz	-0.065	11	PASS
802.11 AC20	5180 MHz	3.798	11	PASS
	5200 MHz	3.704	11	PASS
	5240 MHz	3.499	11	PASS
802.11 AC40	5190 MHz	2.264	11	PASS
	5230 MHz	-0.396	11	PASS
802.11 AC80	5210 MHz	-3.727	11	PASS

(802.11a) PSD plot on channel 36



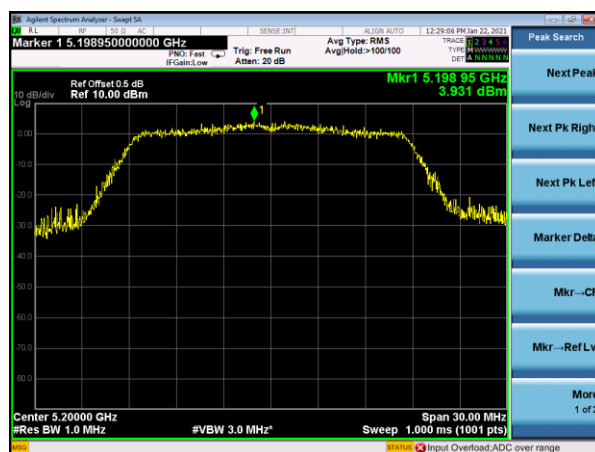
(802.11n20) PSD plot on channel 36



(802.11a) PSD plot on channel 40



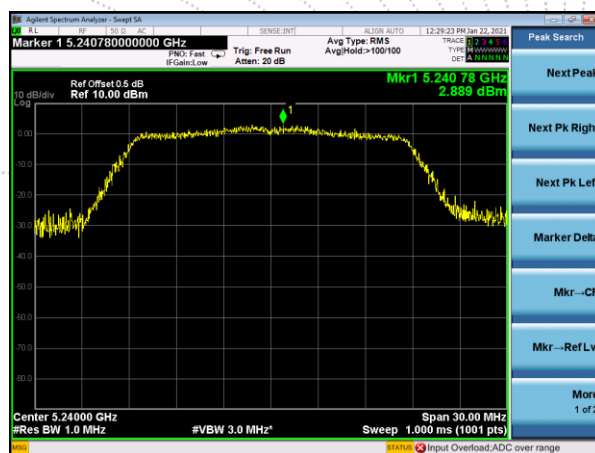
(802.11n20) PSD plot on channel 40



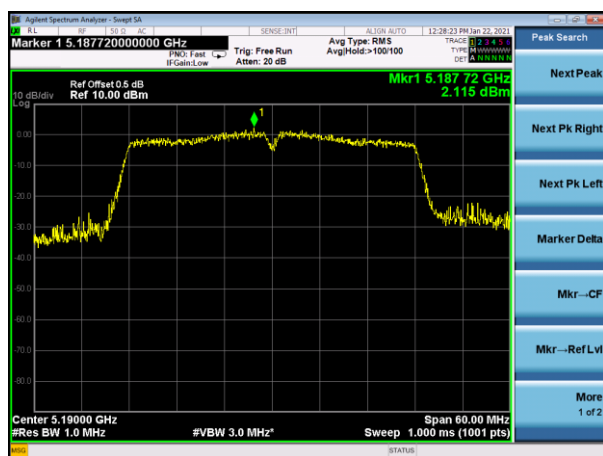
(802.11a) PSD plot on channel 48



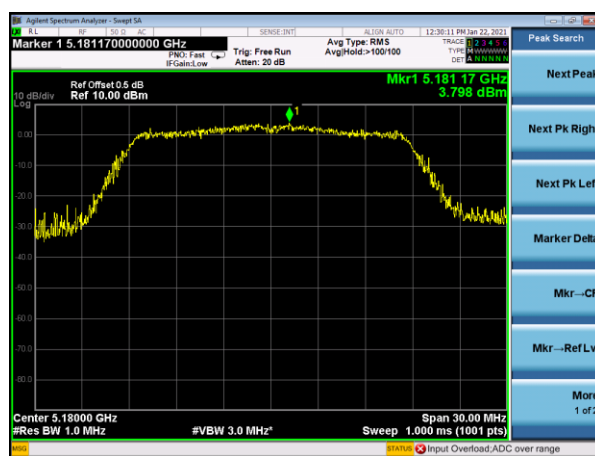
(802.11n20) PSD plot on channel 48



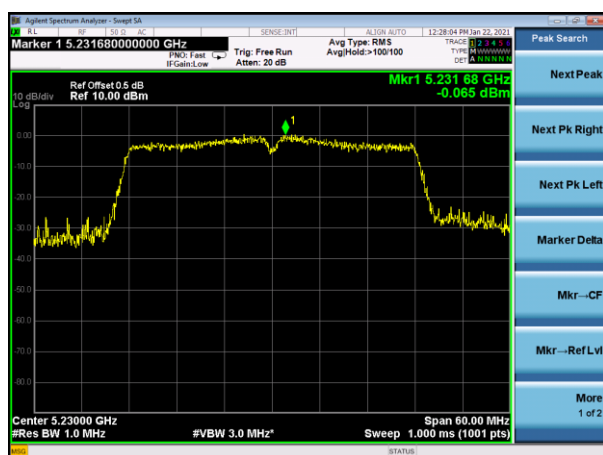
(802.11n40) PSD plot on channel 38



(802.11ac20) PSD plot on channel 36



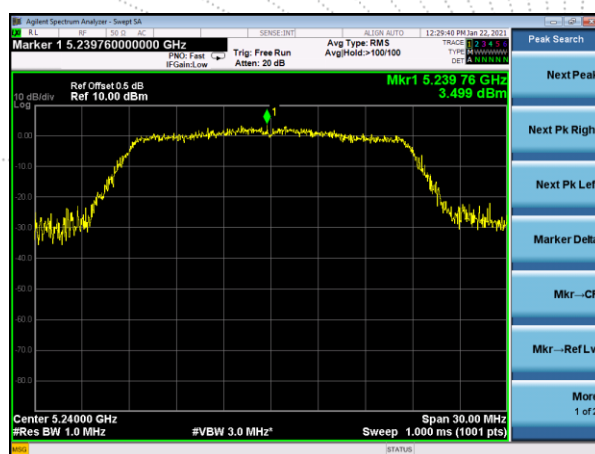
(802.11n40) PSD plot on channel 46



(802.11ac20) PSD plot on channel 40



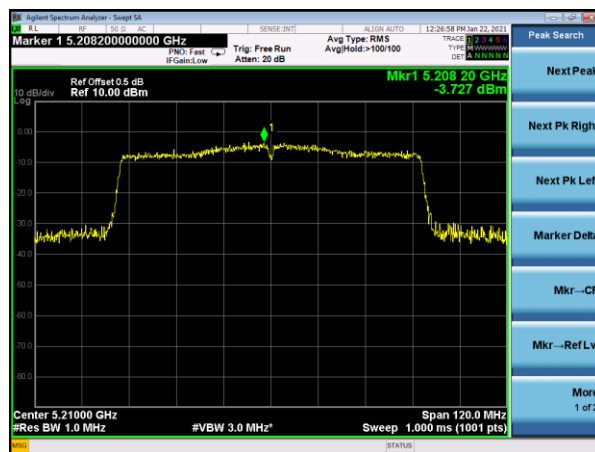
(802.11ac20) PSD plot on channel 48



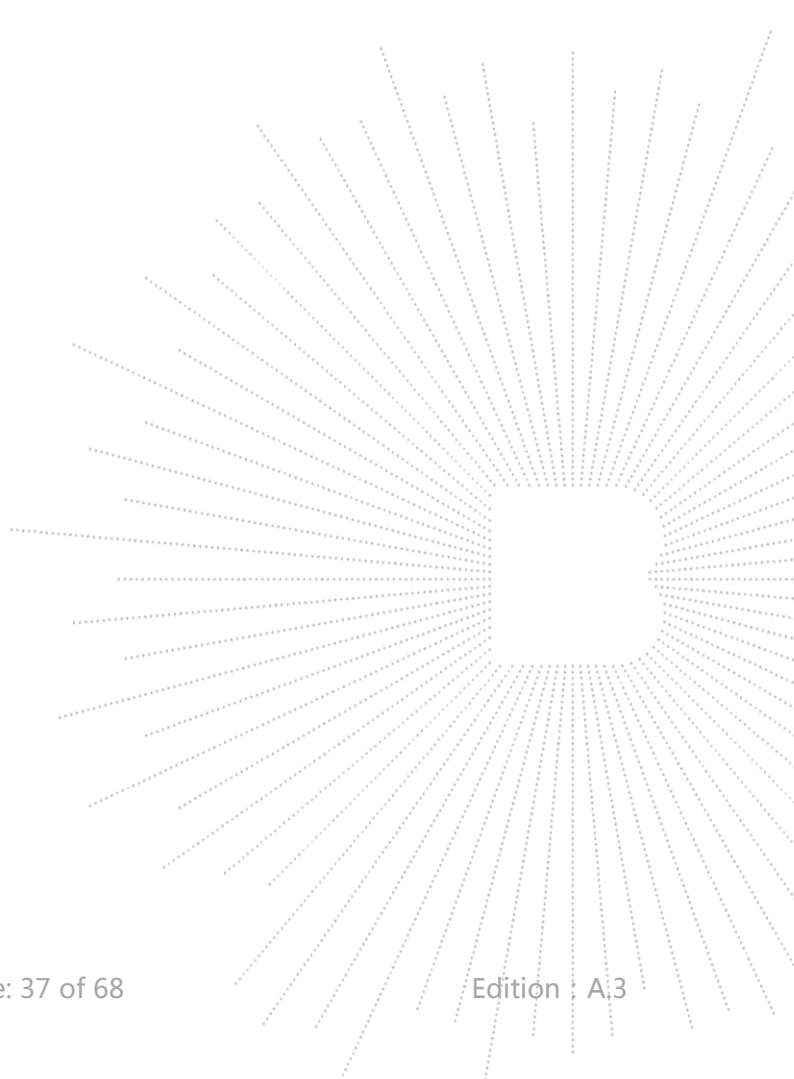
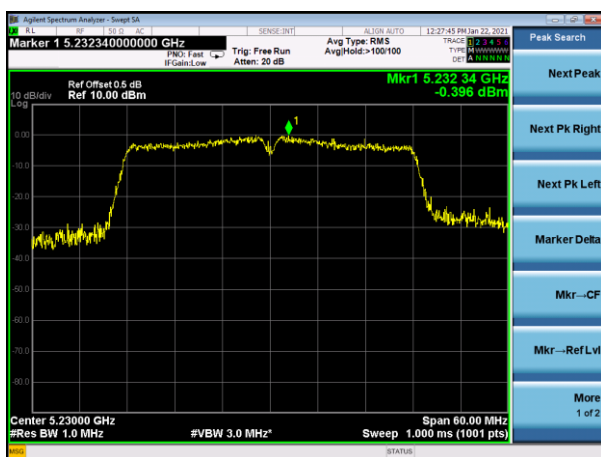
(802.11ac40) PSD plot on channel 38



(802.11ac80) PSD plot on channel 42

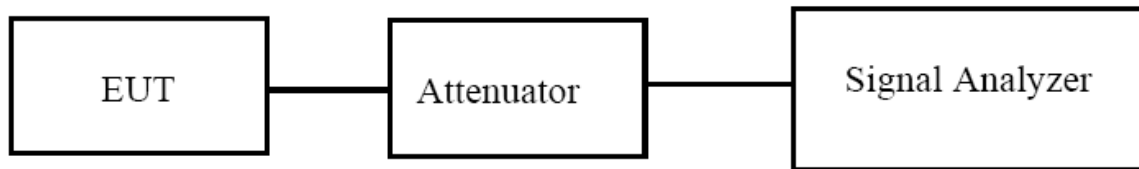


(802.11ac40) PSD plot on channel 46



9. 26DB & 6DB & 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 $\geq 3 \cdot$ 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.

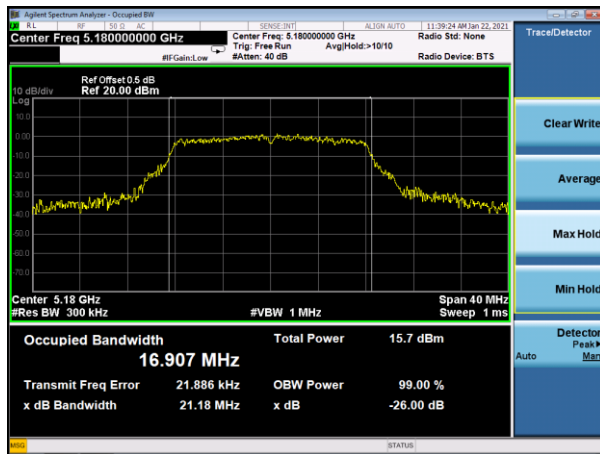
9.5 Test Result

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

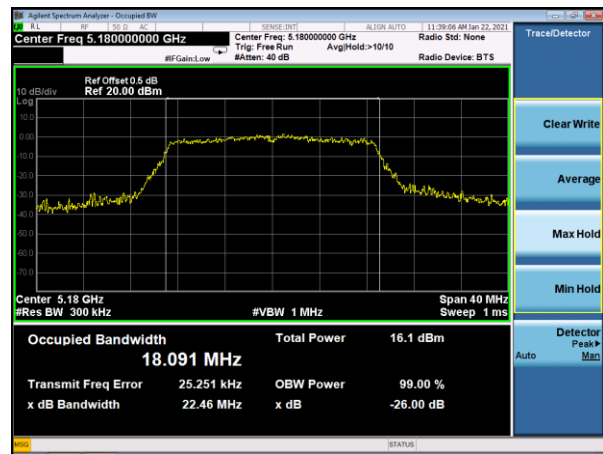
Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)	26dB bandwidth (MHz)	Result
802.11a	CH36	5180	16.907	21.18	Pass
	CH40	5200	16.979	21.50	Pass
	CH48	5240	16.992	21.39	Pass
802.11 n20	CH36	5180	18.091	22.46	Pass
	CH40	5200	17.996	21.67	Pass
	CH48	5240	17.961	21.40	Pass
802.11 n40	CH 38	5190	36.414	50.91	Pass
	CH 46	5230	36.479	49.64	Pass
802.11 AC20	CH36	5180	18.078	21.91	Pass
	CH40	5200	18.063	21.72	Pass
	CH48	5240	18.003	22.89	Pass
802.11 AC40	CH 38	5190	36.532	50.98	Pass
	CH 46	5230	36.571	48.82	Pass
802.11 AC80	CH 42	5210	75.757	94.29	Pass

Test plot

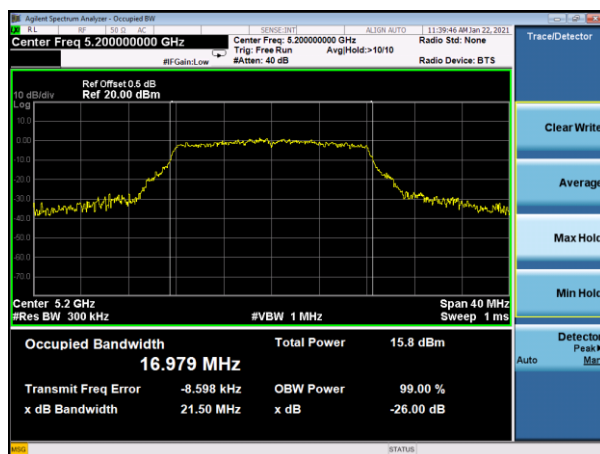
(802.11a) 26dB&99%Bandwidth plot on channel 36



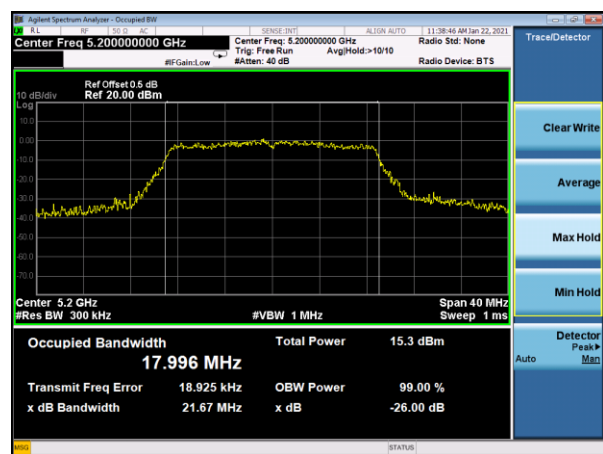
(802.11 n20) 26dB&99%Bandwidth plot on channel 36



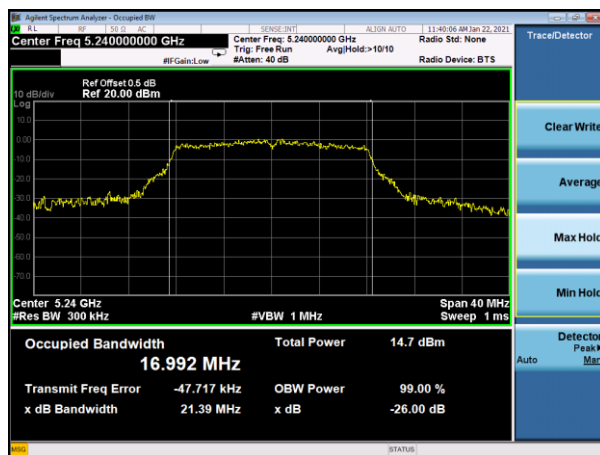
(802.11a) 26dB&99%Bandwidth plot on channel 40



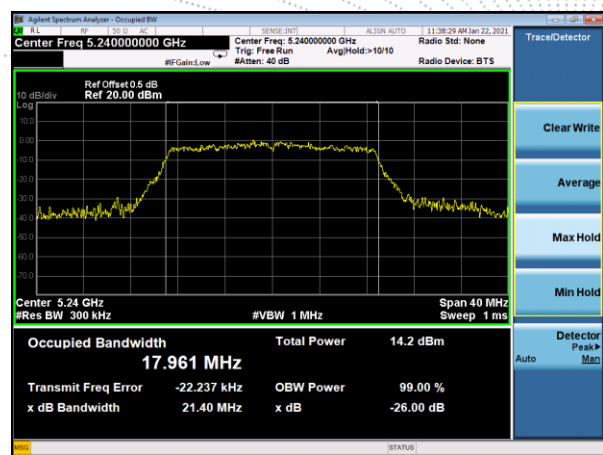
(802.11 n20) 26dB&99%Bandwidth plot on channel 40



(802.11a) 26dB&99%Bandwidth plot on channel 48

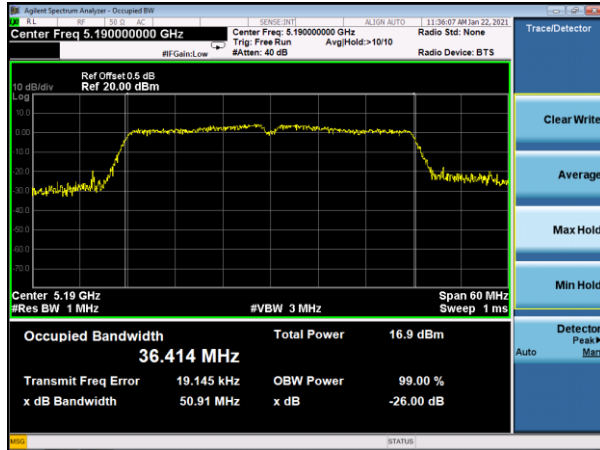


(802.11 n20) 26dB&99%Bandwidth plot on channel 48

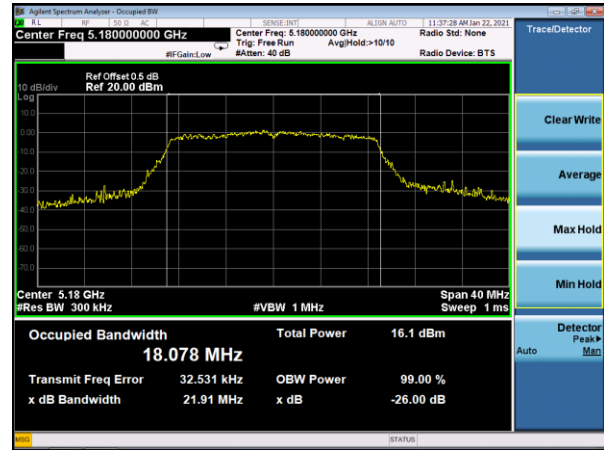


Test plot

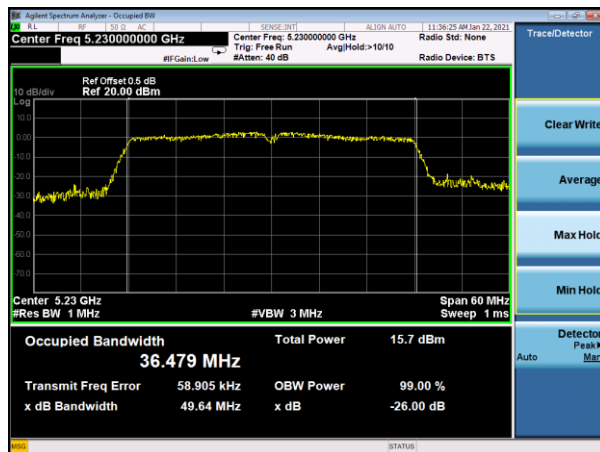
(802.11 n40) 26dB&99%Bandwidth plot on
channel 38



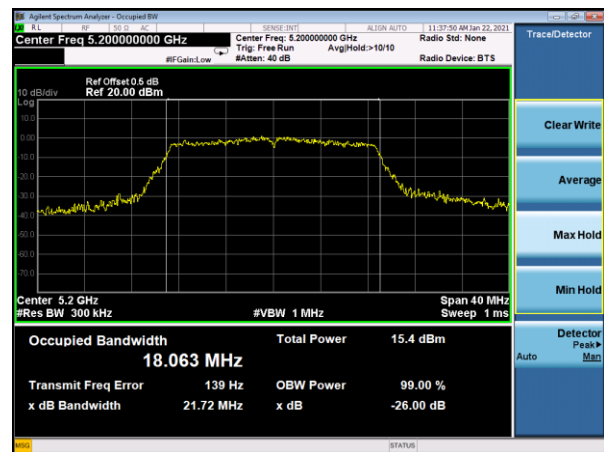
(802.11 AC20) -26dB&99%Bandwidth plot
on channel 36



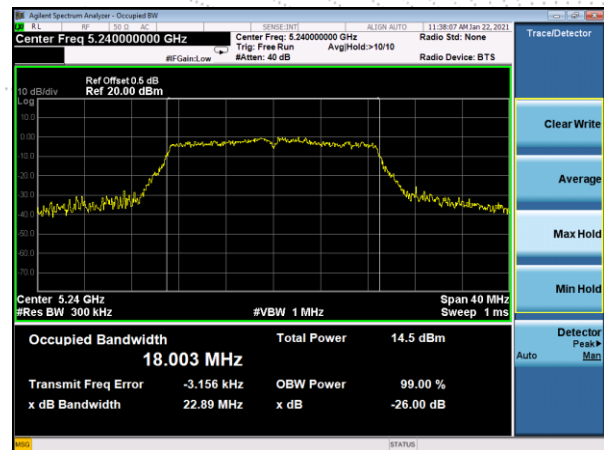
(802.11 n40) 26dB&99%Bandwidth plot on
channel 46



(802.11 AC20) -26dB&99%Bandwidth plot
on channel 40

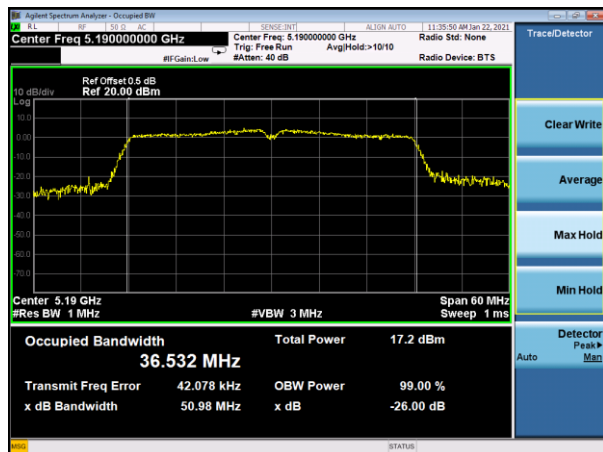


(802.11 AC20) -26dB&99%Bandwidth
plot on channel 48

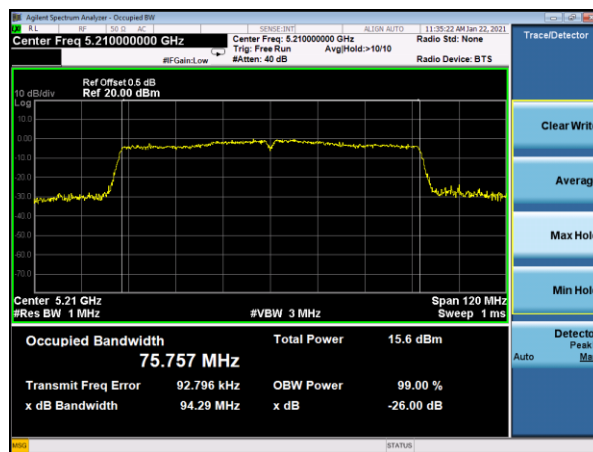


Test plot

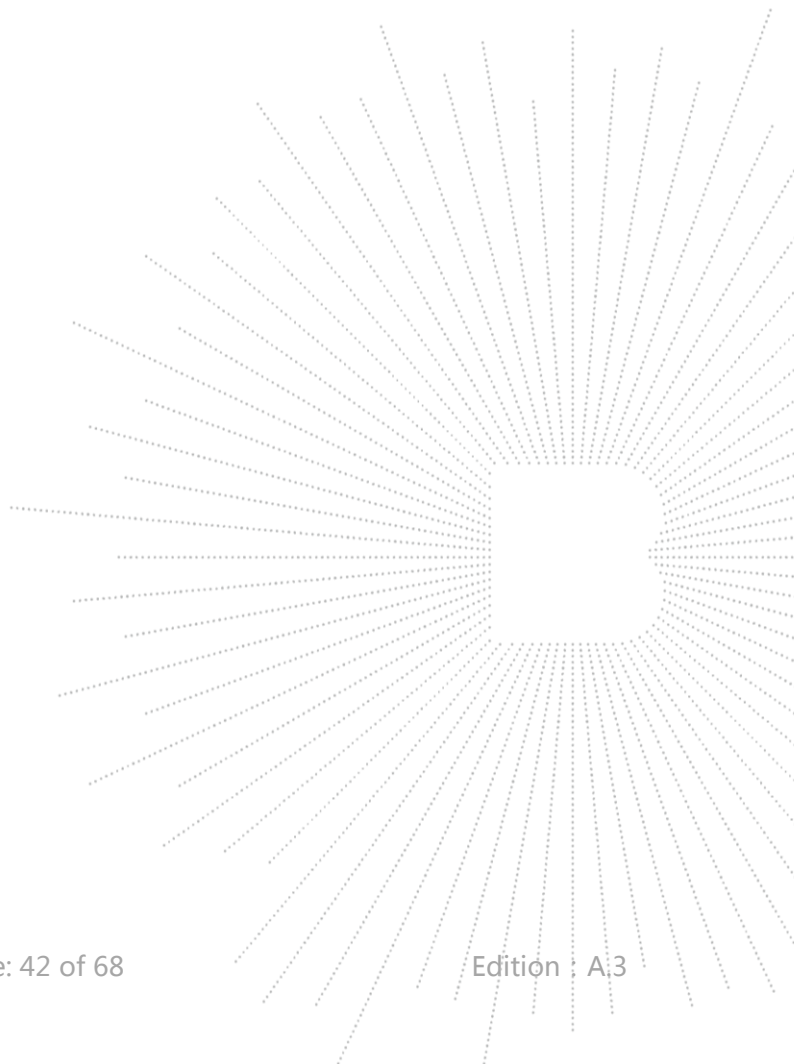
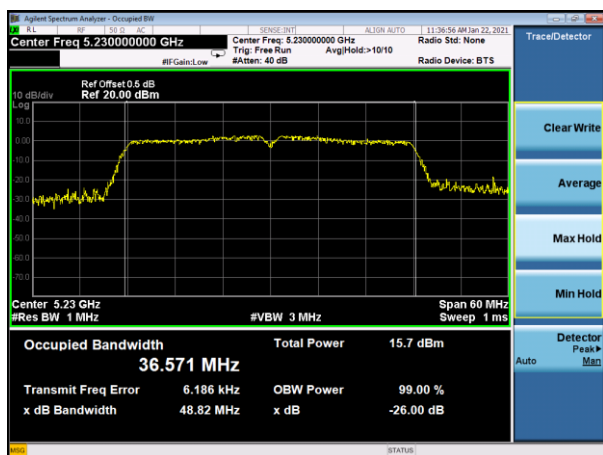
(802.11 AC40) -26dB&99%Bandwidth plot on
channel 38



(802.11 AC80) -26dB&99%Bandwidth plot on
channel 42



(802.11 AC40) -26dB&99%Bandwidth plot on
channel 46



10. MAXIMUM CONDUCTED OUTPUT POWER

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW

10.3 Test procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.¹ However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle $\geq$ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at

the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 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.

10.5 Test Result

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX (5.1G) Mode Frequency U-NII-1 (5180-5240MHz)		

Test Channel	Frequency	Maximum output power. Antenna port (AV)	LIMIT	Result
	(MHz)	(dBm)	dBm	
TX 802.11a Mode				
CH36	5180	12.740	23.98	Pass
CH40	5200	12.200	23.98	Pass
CH48	5240	11.283	23.98	Pass
TX 802.11 n20M Mode				
CH36	5180	13.030	23.98	Pass
CH40	5200	11.995	23.98	Pass
CH48	5240	11.588	23.98	Pass
TX 802.11 n40M Mode				
CH38	5190	9.750	23.98	Pass
CH46	5230	10.246	23.98	Pass
TX 802.11 AC20M Mode				
CH36	5180	12.827	23.98	Pass
CH40	5200	12.839	23.98	Pass
CH48	5240	11.987	23.98	Pass
TX 802.11 AC40M Mode				
CH38	5190	10.523	23.98	Pass
CH46	5230	9.437	23.98	Pass
TX 802.11 AC80M Mode				
CH42	5210	7.412	23.98	Pass

11. OUT OF BAND EMISSIONS

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.4 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