



Microtest
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Test Report

Report No.: MTi210817007-10E2
Date of issue: September 17, 2021
Applicant: Anker Innovations Limited
Product name: Wireless Headphone
Model(s): A3510, A3511
FCC ID: 2AOKB-A3510

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

Instructions

1. This test report shall not be partially reproduced without the written consent of the laboratory.
2. The test results in this test report are only responsible for the samples submitted
3. This test report is invalid without the seal and signature of the laboratory.
4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.
5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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TEST RESULT CERTIFICATION	
Applicant's name	Anker Innovations Limited
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Manufacturer's Name	Anker Innovations Limited
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Factory's Name	Senmai Electron Limited
Address	No. 5 Shuiling Road, Zhouwu Industrial Zone, Dongcheng District, Dongguan City
Product description	
Product name	Wireless Headphone
Trademark	ANKER
Model Name	A3510
Serial Model	A3511
Standards	FCC Part 15.247
Test procedure.....	ANSI C63.10-2013
Date of Test	
Date (s) of performance of tests	August 26, 2021 ~ September 17, 2021
Test Result	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.	

Testing Engineer

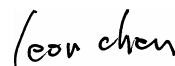
:



(Danny Xu)

Technical Manager

:



(Leon Chen)v

Authorized Signatory

:



(Tom Xue)

1. General Information

1.1. Description of EUT

Product name:	Wireless Headphone
Model name:	A3510
Serial model:	A3511
Difference in series models:	Type A3511 has the same Circuit diagram, PCB layout and all electrical construction with type A3510. For A3511: The ANC function has been cancelled, and the two ANC MICs are cancelled, and the surface paint color is different.
Operation frequency:	2402-2480MHz
Modulation type:	GFSK
Bit Rate of transmitter:	1 Mbps
Antenna type:	PCB Antenna
Antenna gain:	1.5dBi
Max. output power:	3.690 dBm
Hardware version:	D
Software version:	V1.5
Power supply:	DC 3.7V from battery
EUT serial number:	MTi210817007-10-S0001

1.2. Operation channel list

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3. Test channel list

Channel	Channel	Frequency (MHz)
Low	00	2402
Middle	19	2440
High	39	2480

1.4. Ancillary equipment list

Equipment	Model	S/N	Manufacturer	Certificate type
Laptop	E485	/	Lenovo	/

1.5. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
1	/	/	/	/	

Note:

(1)The support equipment was authorized by Declaration of Confirmation.

(2)For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2. Summary of Test Results

Test procedures according to the technical standards:

No.	Standard Section	Test Item	Result	Remark
1	15.203	Antenna Requirement	Pass	
2	15.247 (b)	Peak Output Power	Pass	
3	15.207	Conducted Emission	Pass	
4	15.247 (d) & 15.209	Radiated Spurious Emission	Pass	
5	15.247 (e)	Power Spectral Density	Pass	
6	15.247 (a)(2)	6dB Bandwidth	Pass	
7	558074 D01 15.247 Meas Guidance v05r02 Chapter 6	Duty Cycle	Pass	
8	15.205	Band Edge Emission	Pass	
9	15.247(d)	Spurious RF Conducted Emissions	Pass	

3. Test Facilities and Accreditations

3.1. Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China.
FCC Registration No.:	448573

3.2. Environmental conditions

Temperature:	15°C~35°C
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3. Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

3.4. Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscent co., ltd	JS1120-3	2.5.77.0418

4. Equipment list

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2021/06/02	2022/06/01
MTI-E044	TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-1338	2021/05/30	2023/05/29
MTI-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2021/06/02	2022/06/01
MTI-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2021/06/02	2022/06/01
MTI-E058	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2021/06/02	2022/06/01
MTI-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2021/06/02	2022/06/01
MTI-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2021/06/02	2022/06/01
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2021/06/02	2022/06/01
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2021/06/02	2022/06/01
MTI-E045	Double Ridged Broadband Horn Antenna	schwarzbeck	BBHA 9120D	9120D-2278	2021/05/30	2023/05/29
MTI-E021	EMI Test Receiver	Rohde&schwarz	ESCS30	100210	2021/06/02	2022/06/01
MTI-E022	Pulse Limiter	Schwarzbeck	VSTD 9561-F	00679	2021/06/02	2022/06/01
MTI-E023	Artificial mains network	Schwarzbeck	NSLK 8127	NSLK 8127 #841	2021/06/02	2022/06/01
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519B	00044	2021/05/30	2023/05/29
MTI-E048	Amplifier	Agilent	8449B	3008A02400	2021/06/02	2022/06/01
MTI-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2021/06/02	2022/06/01

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

5. Test Result

5.1. Antenna requirement

5.1.1. Standard Requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device

5.1.2. EUT Antenna

The EUT antenna is PCB antenna (1.5dBi). It comply with the standard requirement.

5.2. Peak Output Power Test

5.2.1. Limit

FCC Part15 Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(b)(3)	Peak output power	1 watt or 30dBm	2400-2483.5

5.2.2. Test setup



5.2.3. Test Procedure

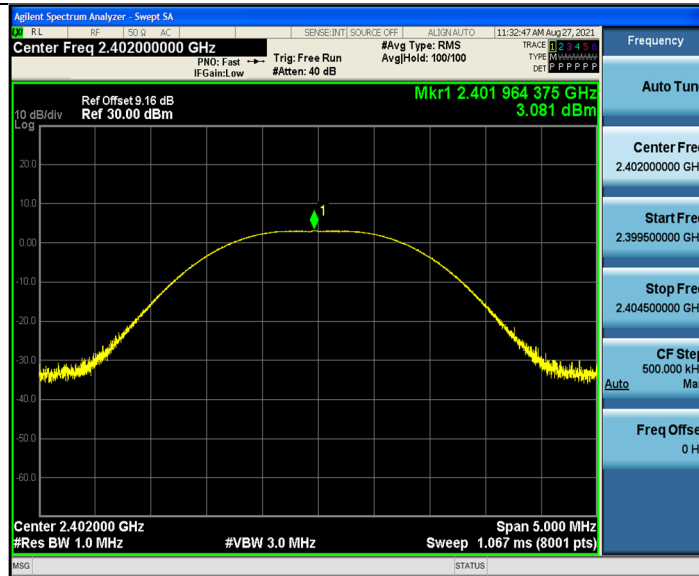
- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:
 RBW=1MHz, VBW=3MHz, Detector=Peak (If 20dB BW ≤1 MHz)
 RBW=3MHz, VBW=8MHz, Detector=Peak (If 20dB BW > 1 MHz)
- (3) The EUT was set to continuously transmitting in the max power during the test.

5.2.4. Test Results

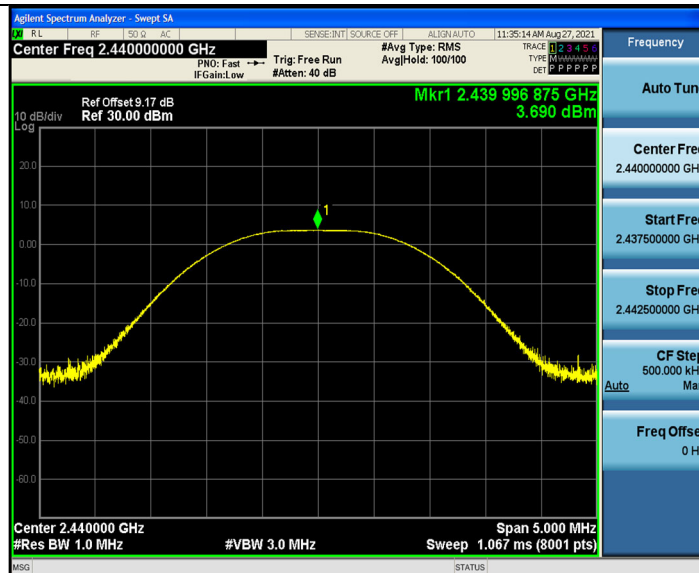
EUT:	Wireless Headphone	Model Name:	A3510
Pressure:	1012 hPa	Test Voltage:	DC 3.7V from battery
Test Mode:	TX Mode /CH00, CH19, CH39		

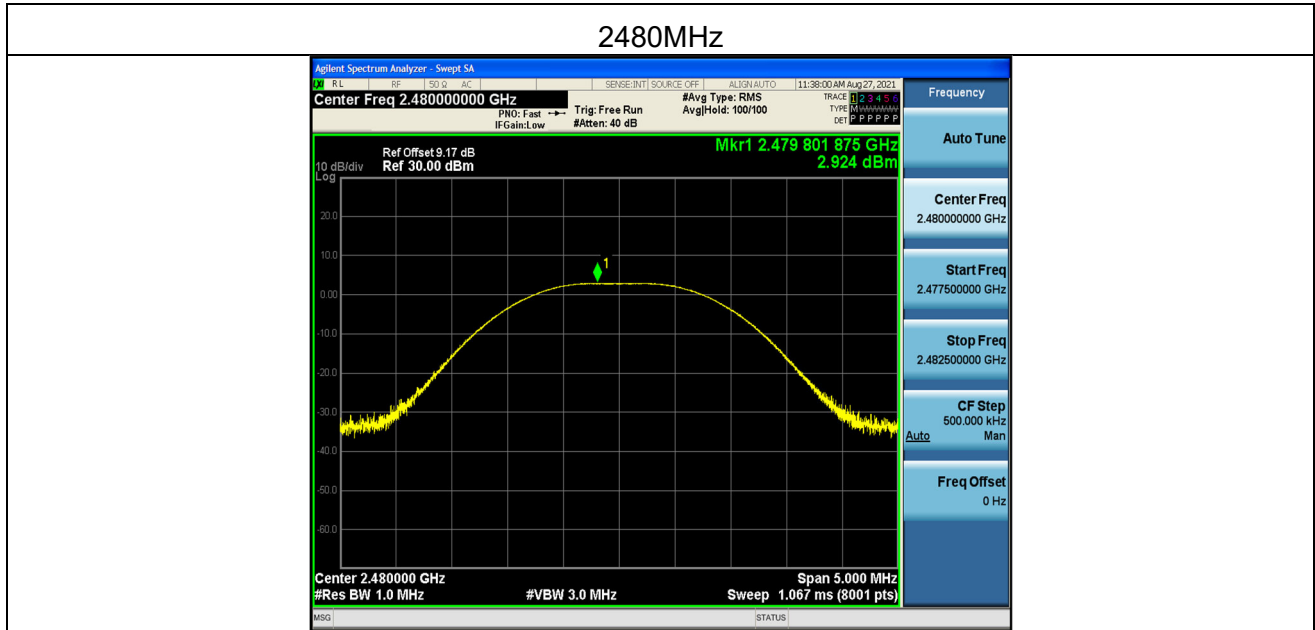
Test Channel	Frequency	Maximum Peak Output Power	Limit
	(MHz)	(dBm)	dBm
CH00	2402	3.081	30
CH19	2440	3.690	30
CH39	2480	2.924	30

2402MHz



2440MHz





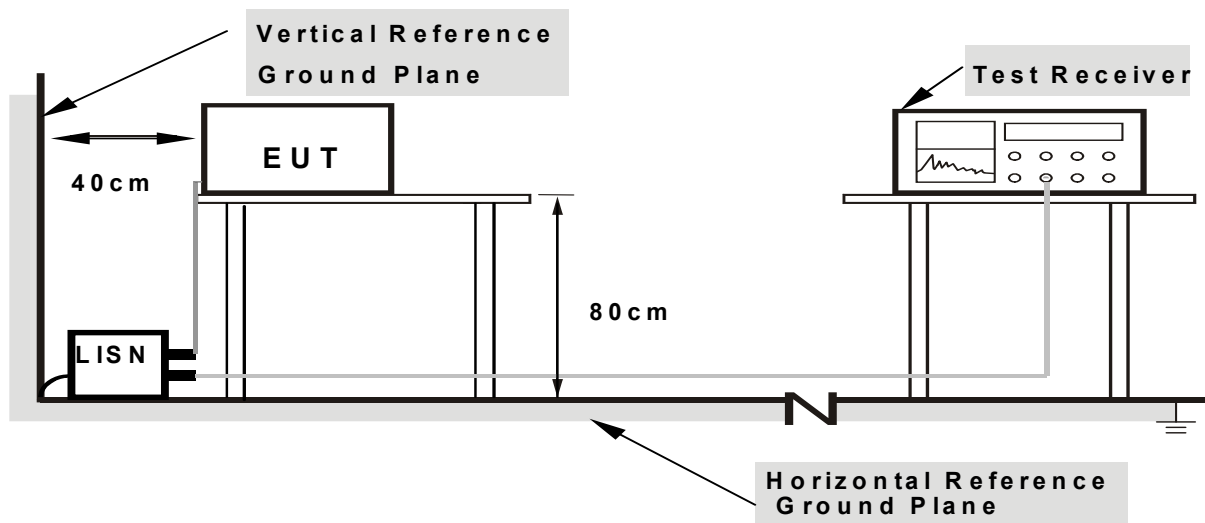
5.3. Conducted emission

5.3.1. Limits

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-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

Note: *Decreases with the logarithm of the frequency.

5.3.2. Test Setup



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.3.3. Test Procedure

a. 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.

b. The following table is the setting of the receiver

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

- c. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f. LISN at least 80 cm from nearest part of EUT chassis.

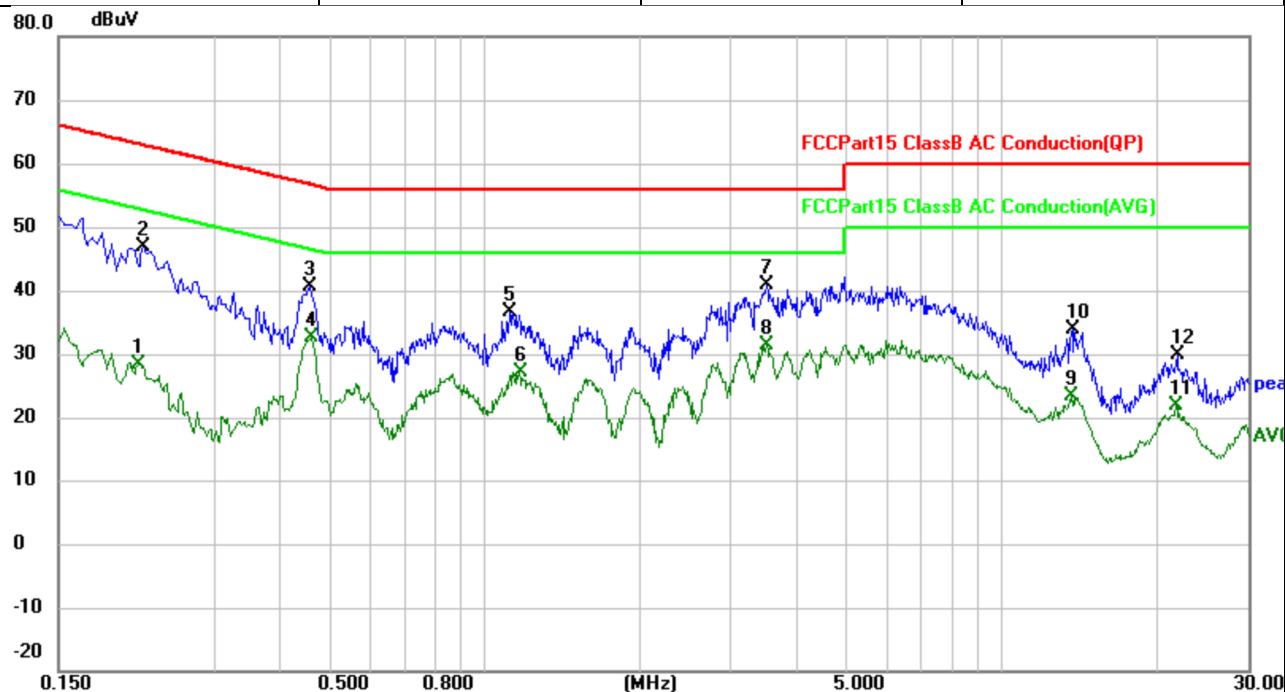
For the actual test configuration, please refer to the related Item – EUT Test Photos.

5.3.4. Test Results

Note:

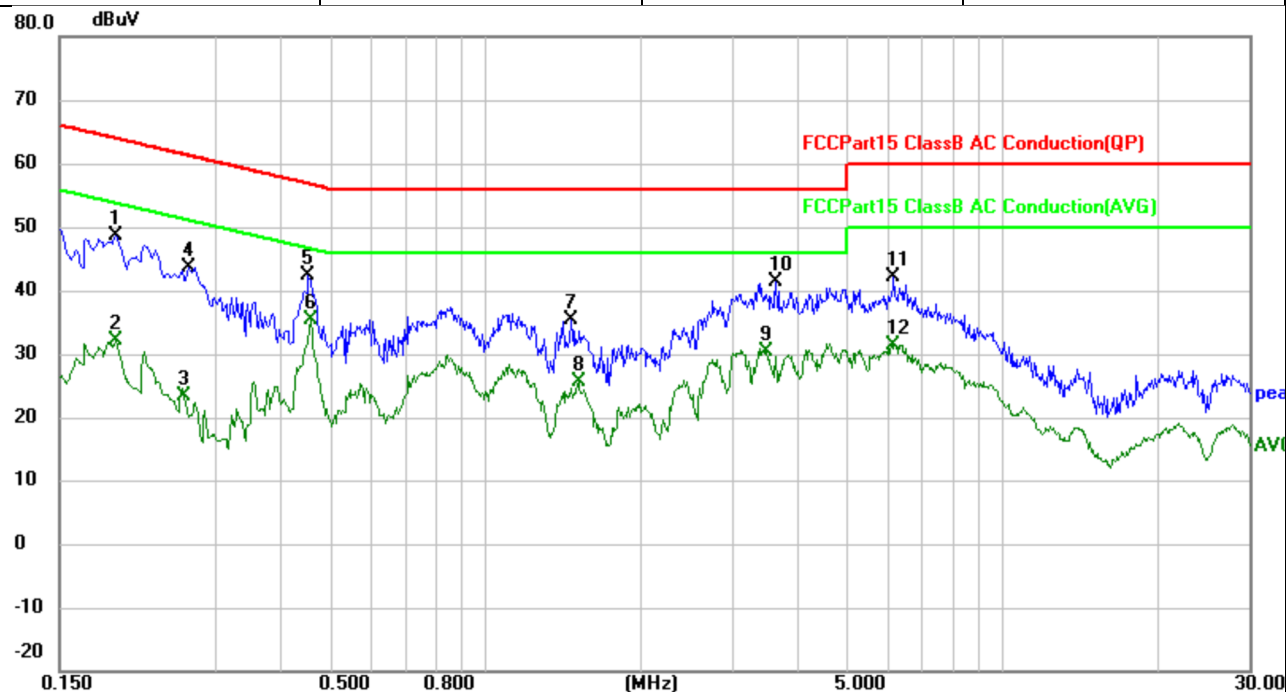
1. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is GFSK CH39.
2. Emission Level = Reading Level + Factor, Margin = Emission Level - Limit, Factor = LISN modulus + Cable Loss

EUT:	Wireless Headphone	Model Name:	A3510
Pressure:	1010hPa	Phase:	L
Test Voltage:	DC 5V from notebook AC 120V/60Hz	Test Mode:	TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2139	17.44	10.98	28.42	53.05	-24.63	AVG
2		0.2179	35.90	10.98	46.88	62.90	-16.02	QP
3		0.4580	29.58	11.04	40.62	56.73	-16.11	QP
4	*	0.4620	21.59	11.04	32.63	46.66	-14.03	AVG
5		1.1220	23.11	13.54	36.65	56.00	-19.35	QP
6		1.1656	13.45	13.63	27.08	46.00	-18.92	AVG
7		3.5100	29.40	11.41	40.81	56.00	-15.19	QP
8		3.5100	20.02	11.41	31.43	46.00	-14.57	AVG
9		13.6900	11.60	11.68	23.28	50.00	-26.72	AVG
10		13.7659	22.08	11.68	33.76	60.00	-26.24	QP
11		21.8260	10.12	11.84	21.96	50.00	-28.04	AVG
12		21.8658	18.10	11.83	29.93	60.00	-30.07	QP

EUT:	Wireless Headphone	Model Name:	A3510
Pressure:	1010hPa	Phase:	N
Test Voltage:	DC 5V from notebook AC 120V/60Hz	Test Mode:	TX



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1922	37.81	10.92	48.73	63.94	-15.21	QP
2		0.1922	21.10	10.92	32.02	53.94	-21.92	AVG
3		0.2600	12.57	10.93	23.50	51.43	-27.93	AVG
4		0.2660	32.78	10.92	43.70	61.24	-17.54	QP
5		0.4540	31.43	10.90	42.33	56.80	-14.47	QP
6	*	0.4580	24.40	10.90	35.30	46.73	-11.43	AVG
7		1.4657	21.09	14.23	35.32	56.00	-20.68	QP
8		1.5180	11.18	14.34	25.52	46.00	-20.48	AVG
9		3.4980	18.96	11.39	30.35	46.00	-15.65	AVG
10		3.6419	30.06	11.39	41.45	56.00	-14.55	QP
11		6.1859	30.75	11.41	42.16	60.00	-17.84	QP
12		6.1859	20.07	11.41	31.48	50.00	-18.52	AVG

5.4. Radiated spurious emission

5.4.1. Limits

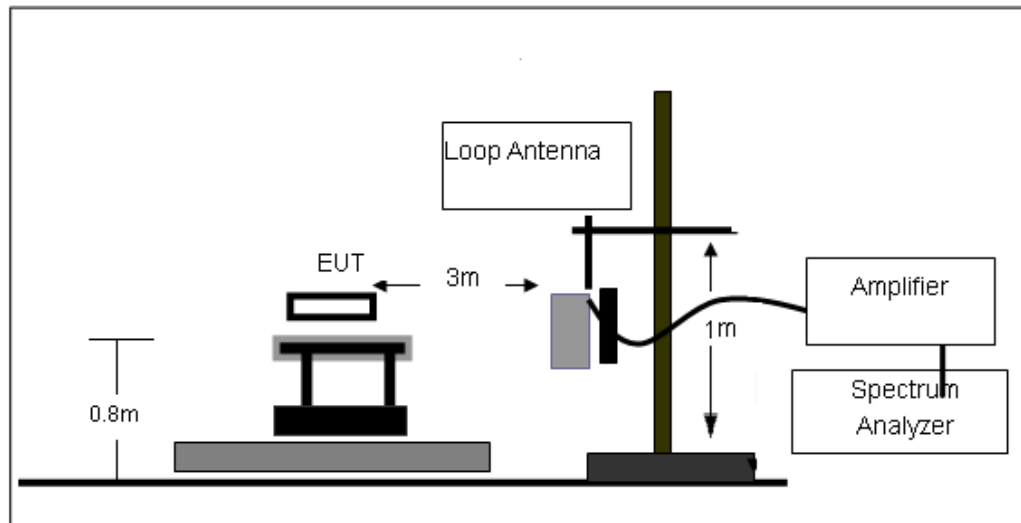
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

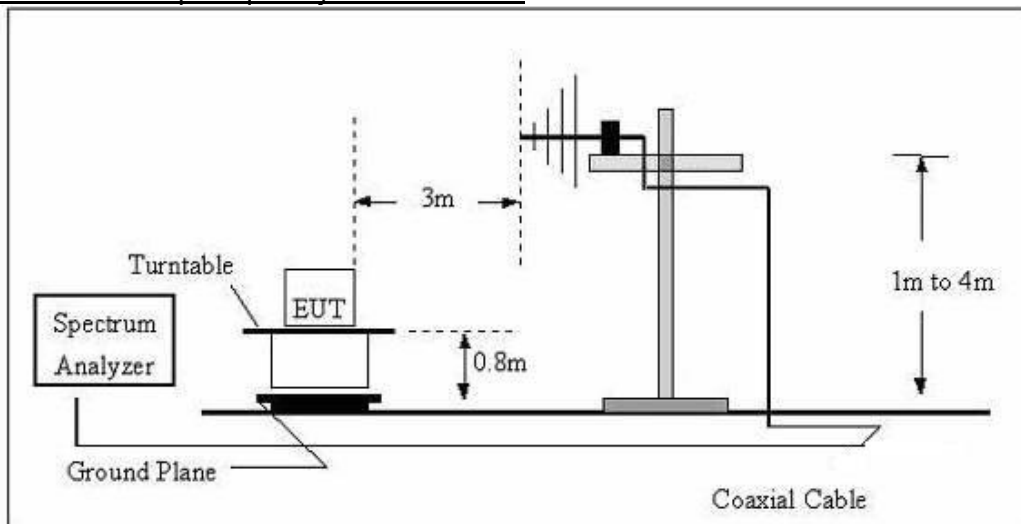
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.4.2. Test Setup

Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz

