FCC Part 15C
Measurement and Test Report

For

North tech Group corp

1678 NE 123rd street

FCC ID: 2ANCVNT-Z3

FCC Rule(s):	FCC Part 15.247
Product Description:	Headphone
Tested Model:	NT-Z3 Harmony
Report No.:	STR17098081I-2
Tested Date:	2017-09-08 to 2017-09-25
Issued Date:	2017-09-25
Tested By:	Mike Shi / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

Shenzhen SEM.Test Technology Co., Ltd.
1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C.（518101）
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	North tech Group corp
Address of applicant:	1678 NE 123rd street
Manufacturer:	North tech Group corp
Address of manufacturer:	1678 NE 123rd street

General Description of EUT	
Product Name:	Headphone
Trade Name:	North Tech
Model No.:	NT-Z3 Harmony
Adding Model(s):	/
Rated Voltage:	DC 3.7V by battery; USB DC 5V
Battery Capacity:	500mAh
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth Version:	V4.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	-0.58dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB
Antenna Gain:	0dBi

1.2 Test Standards

The following report is prepared on behalf of the North tech Group corp in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 558074 D01 v04 for digital transmission systems shall be performed also.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

FCC – Registration No.: 226174

Shenzhen Morlab Communications Technology Co. Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN1164, and Test Firm Registration Number is 260439.

Note: The Radiation Emission Above 18GHz is test by Shenzhen Morlab Communications Technology Co. Ltd.And the other test is by Shenzhen SEM Test Technology Co., Ltd.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	GFSK(BLE)	2402MHz, 2440MHz, 2480MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

Shenzhen SEM.Test Technology Co., Ltd.

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2018-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2018-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2018-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2018-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

Shenzhen Morlab Communications Technology Co. Ltd.

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
MXE EMI Receiver	Agilent	N9038A	MY54130016	2017.05.17	2018.05.16
Semi-Anechoic Chamber	Changning	9m*6m*6m	N/A	2017.01.11	2018.01.10
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2016.12.09	2017.12.08
Test Antenna - Horn	Schwarzbeck	BBHA9120C	9120C-384	2017.03.30	2018.03.29
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde&Schwarz	2017.05.17	2018.05.16
26.5-40GHz pre-Amplifier	C00990	NSP4000-SP2	Miteq	2017.05.17	2018.05.16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has a PCB antenna, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Procedure

According to the KDB 558074 D01 v04, the test method of power spectral density as below:

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3 × RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 Environmental Conditions

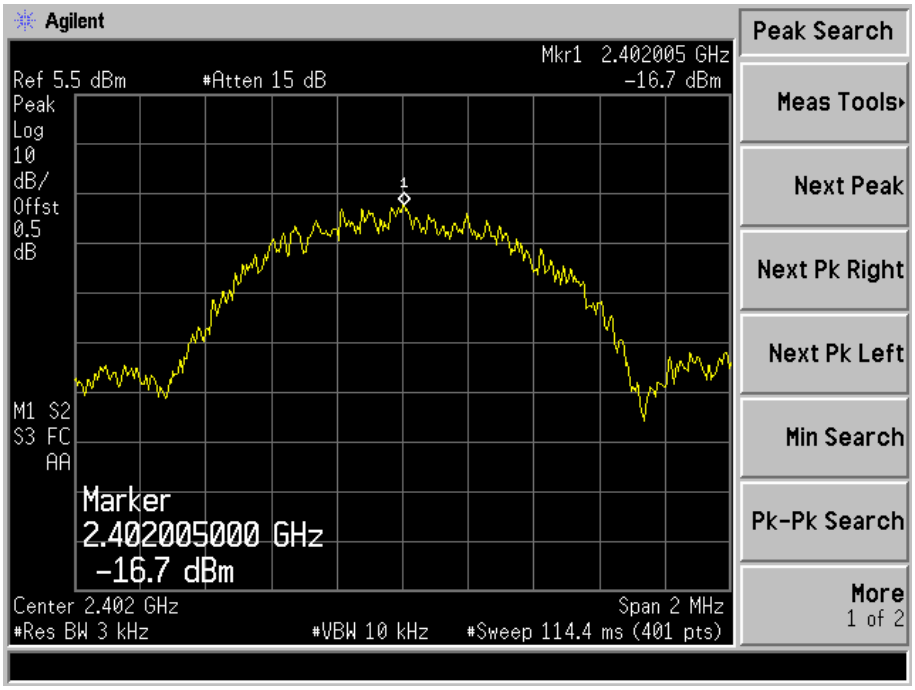
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

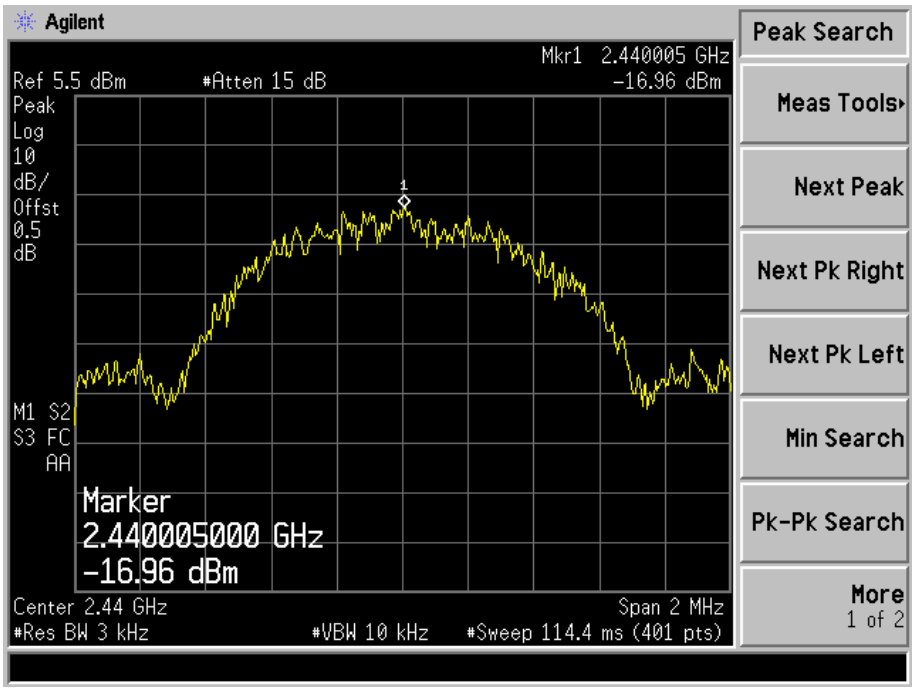
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
GFSK(BLE)	2402	-16.70	8
	2440	-16.96	8
	2480	-15.82	8

Please refer to the following test plots:

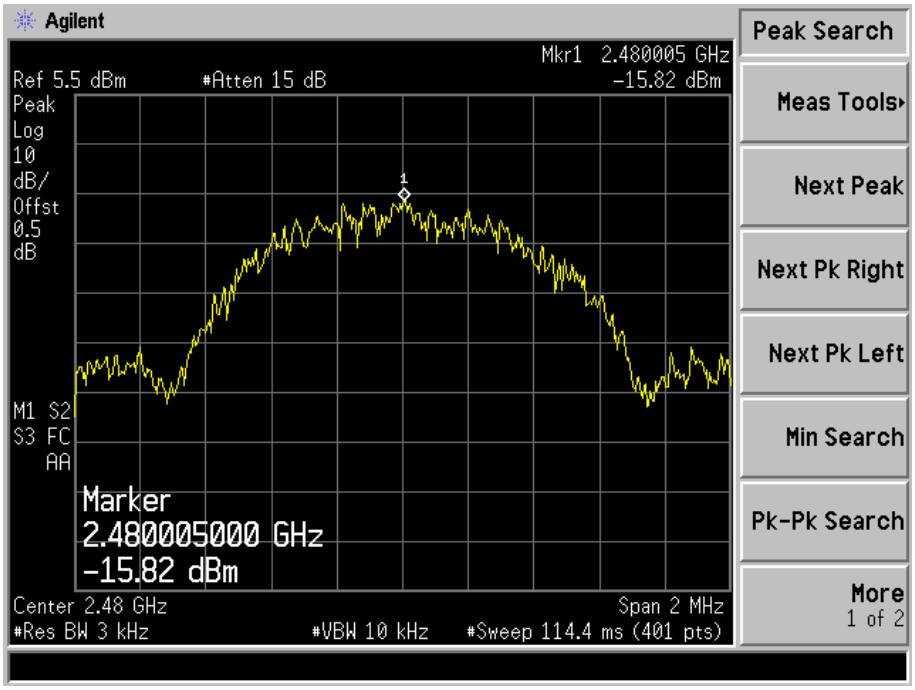
Low Channel



Middle Channel



High Channel



6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 Test Procedure

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

6.3 Environmental Conditions

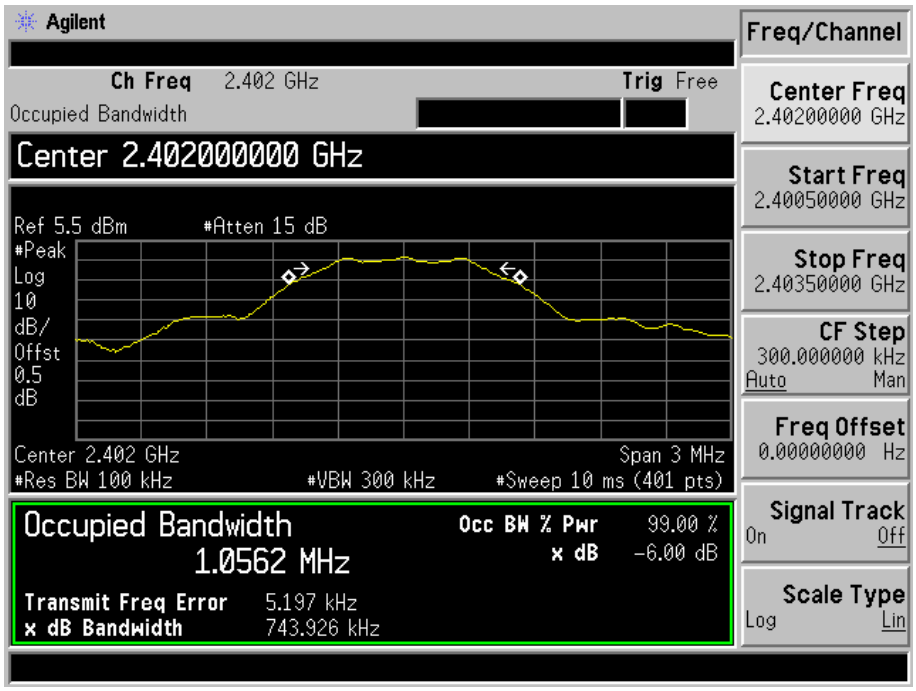
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

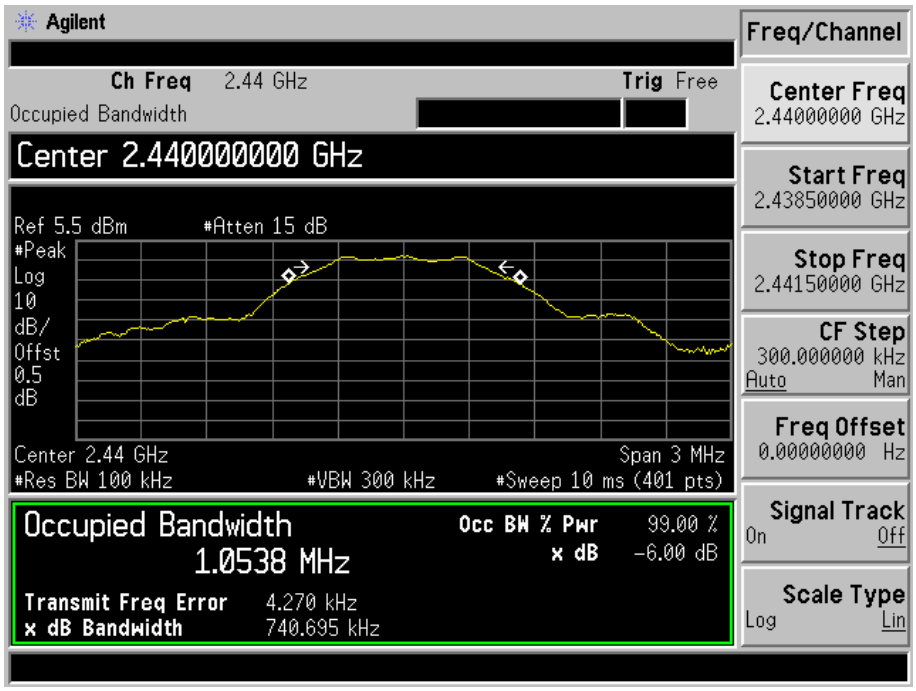
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
GFSK(BLE)	2402	743.926	1056.2	≥500
	2440	740.695	1053.8	≥500
	2480	743.909	1055.5	≥500

Please refer to the following test plots:

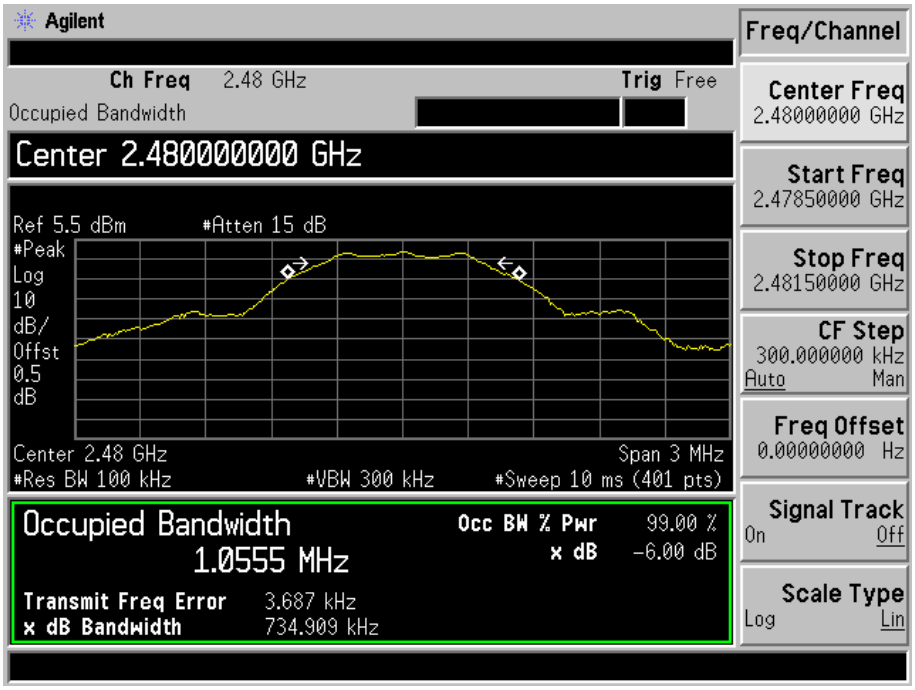
For BLE
Low Channel:



Middle Channel:



High Channel:



7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2 Test Procedure

According to section KDB-558074 D01 v04 section 9.1.1, this procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

a) Set the RBW ⩾ DTS bandwidth.
b) Set VBW ⩾ 3 × RBW.
c) Set span ⩾ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

7.3 Environmental Conditions

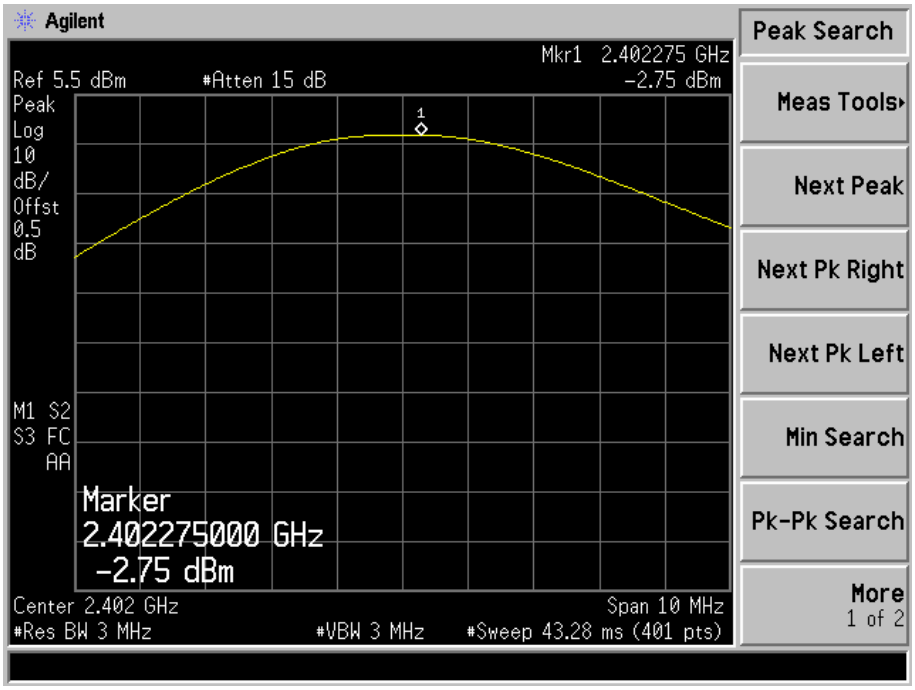
Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results/Plots

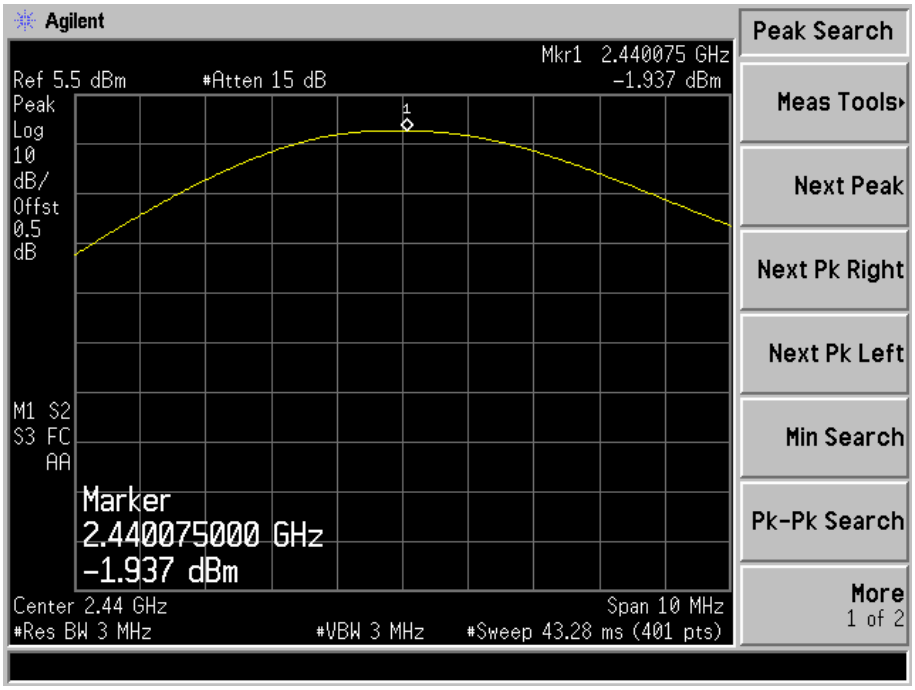
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
GFSK(BLE)	2402	-2.75	0.53	1000
	2440	-1.94	0.64	1000
	2480	-0.58	0.88	1000

Note: the antenna gain of 0dBi less than 6dBi maximum permission antenna gain value based on 1 watt peak output power limit.

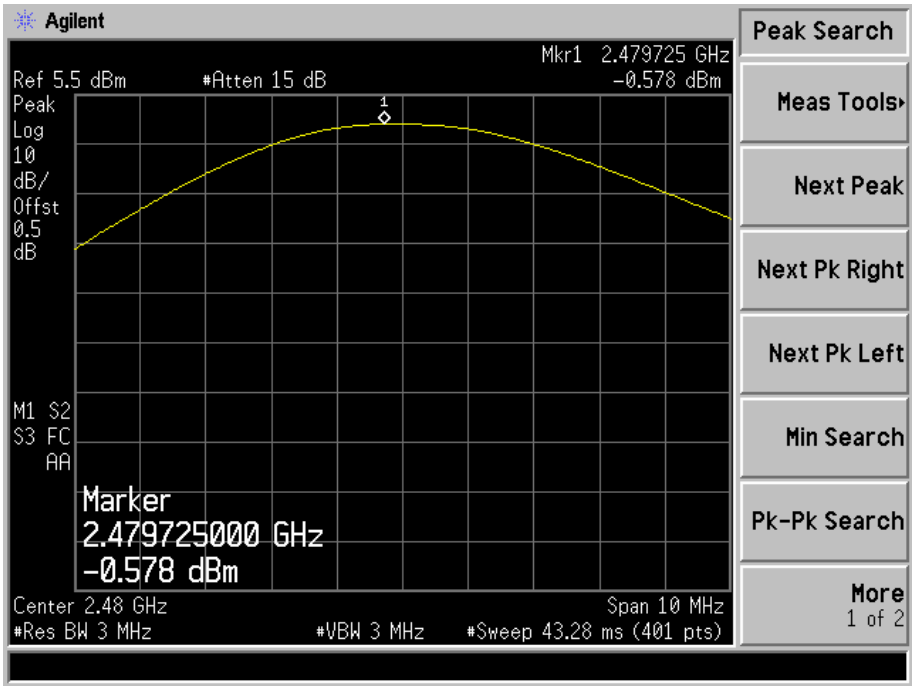
Low Channel



Middle Channel



High Channel



8. Field Strength of Spurious Emissions

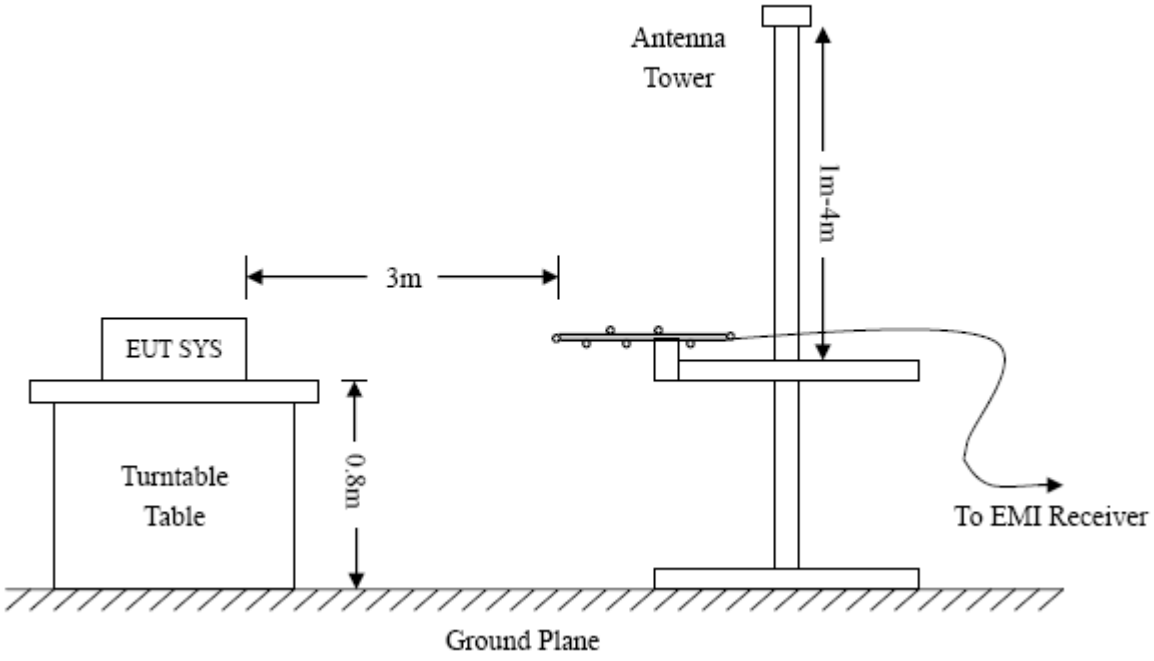
8.1 Standard Applicable

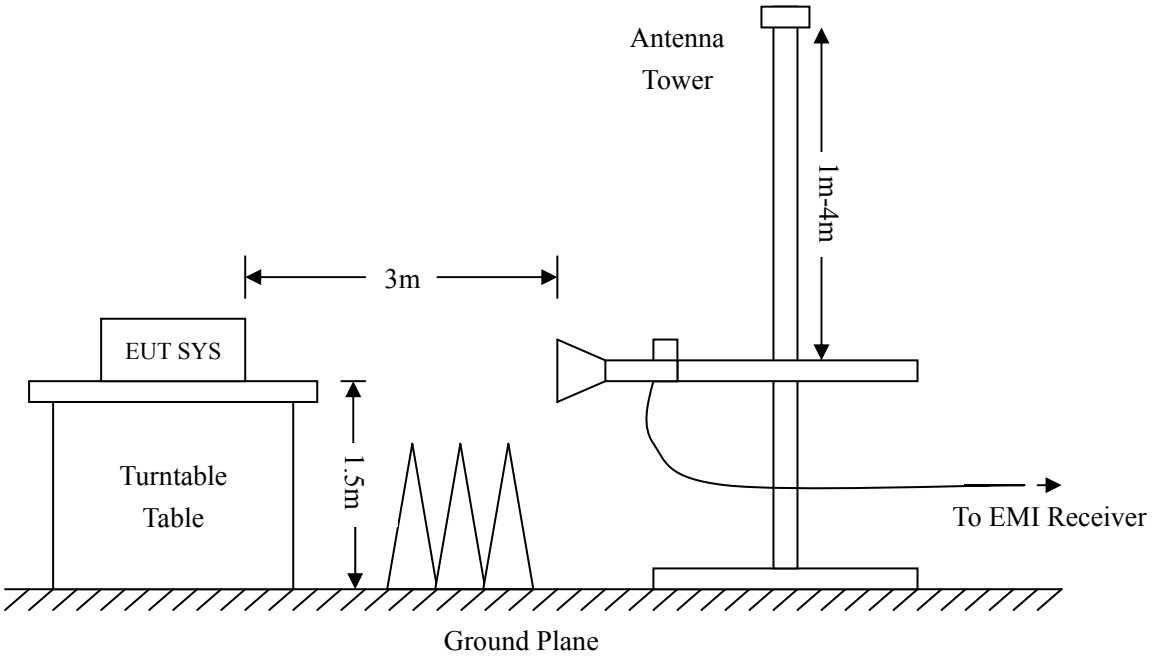
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.





Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

8.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.5 Summary of Test Results/Plots

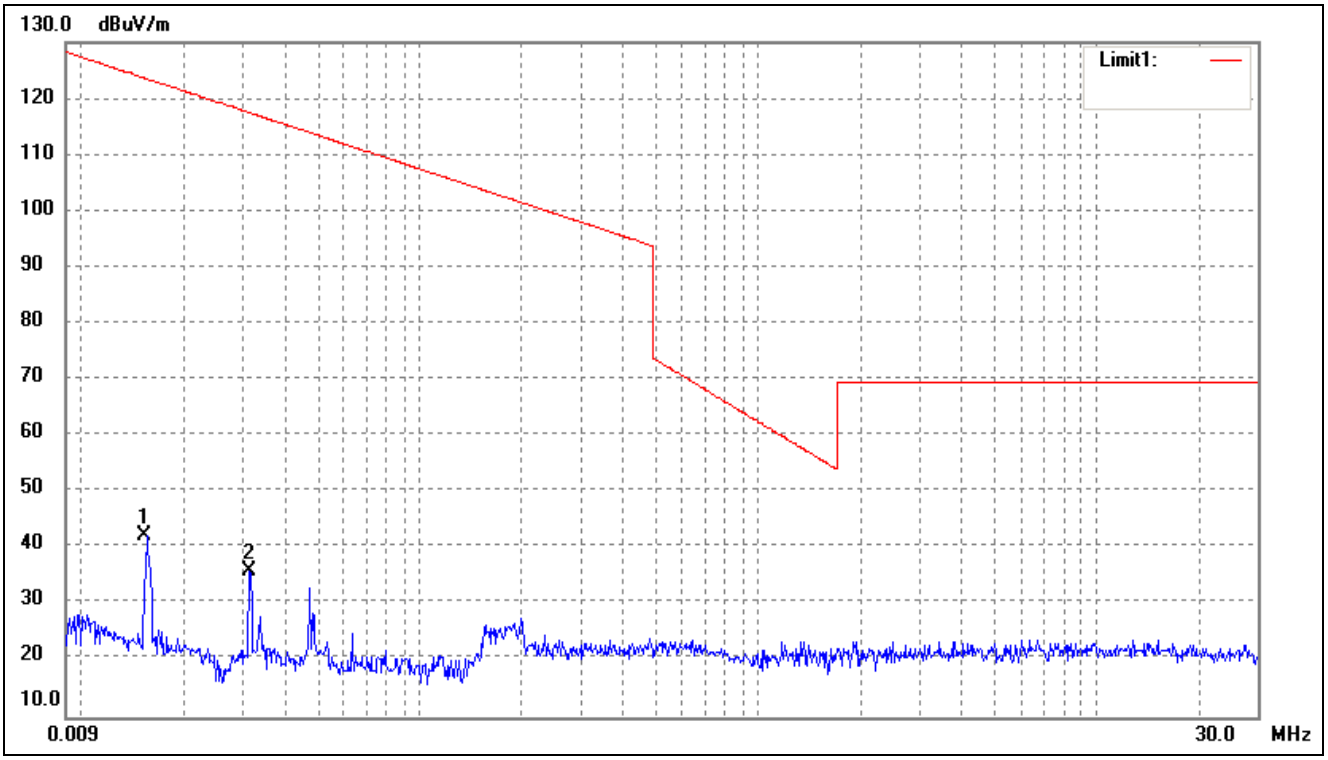
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiated Emissions Test Data (9kHz to 30MHz)

EUT: *Headphone*
Tested Model: *NT-Z3 Harmony*
Operating Condition: *Transmitting Low Channel (2402MHz)_worst case*
Comment: *DC 3.7V*

Test Specification: *Horizontal*

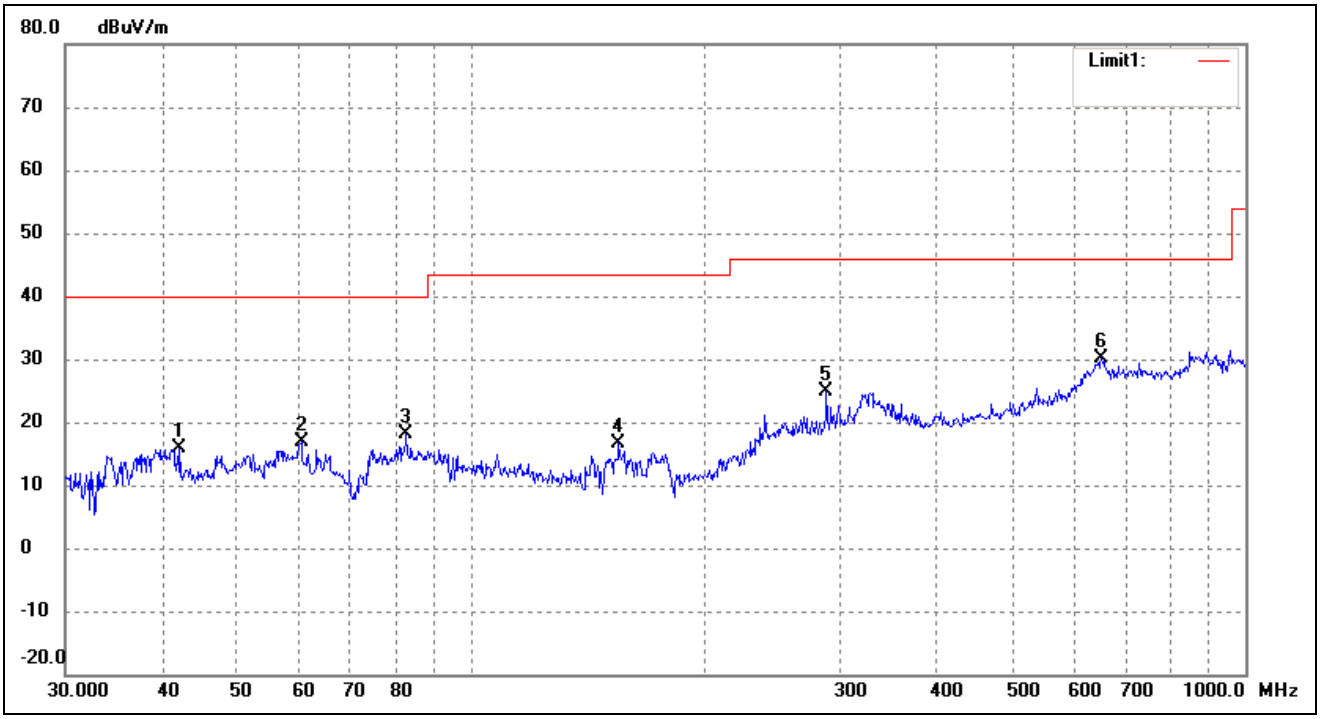


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	0.0154	42.11	0.00	42.11	123.67	-81.56	54	100	peak
2	0.0313	35.90	0.00	35.90	117.55	-81.65	32	100	peak

Plot of Radiated Emissions Test Data

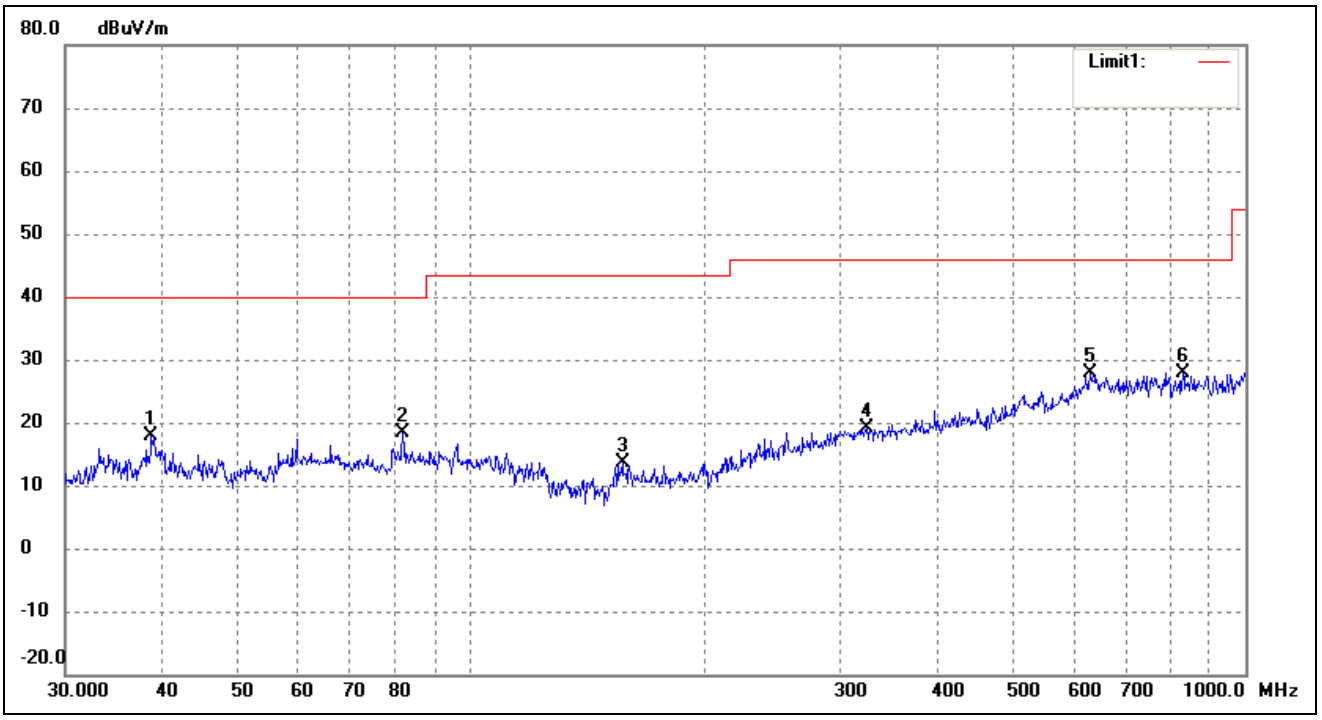
EUT: *Headphone*
Tested Model: *NT-Z3 Harmony*
Operating Condition: *Transmitting-Low channel (2402MHz)*
Comment: *DC 3.7V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	42.1542	32.36	-16.50	15.86	40.00	-24.14	350	100	peak
2	60.4919	33.60	-16.61	16.99	40.00	-23.01	92	100	peak
3	82.6482	37.37	-19.36	18.01	40.00	-21.99	68	100	peak
4	155.3643	35.52	-18.94	16.58	43.50	-26.92	115	100	peak
5	287.9904	34.99	-10.05	24.94	46.00	-21.06	98	100	peak
6	651.9416	31.41	-1.32	30.09	46.00	-15.91	302	100	peak

Test Specification: *Vertical*

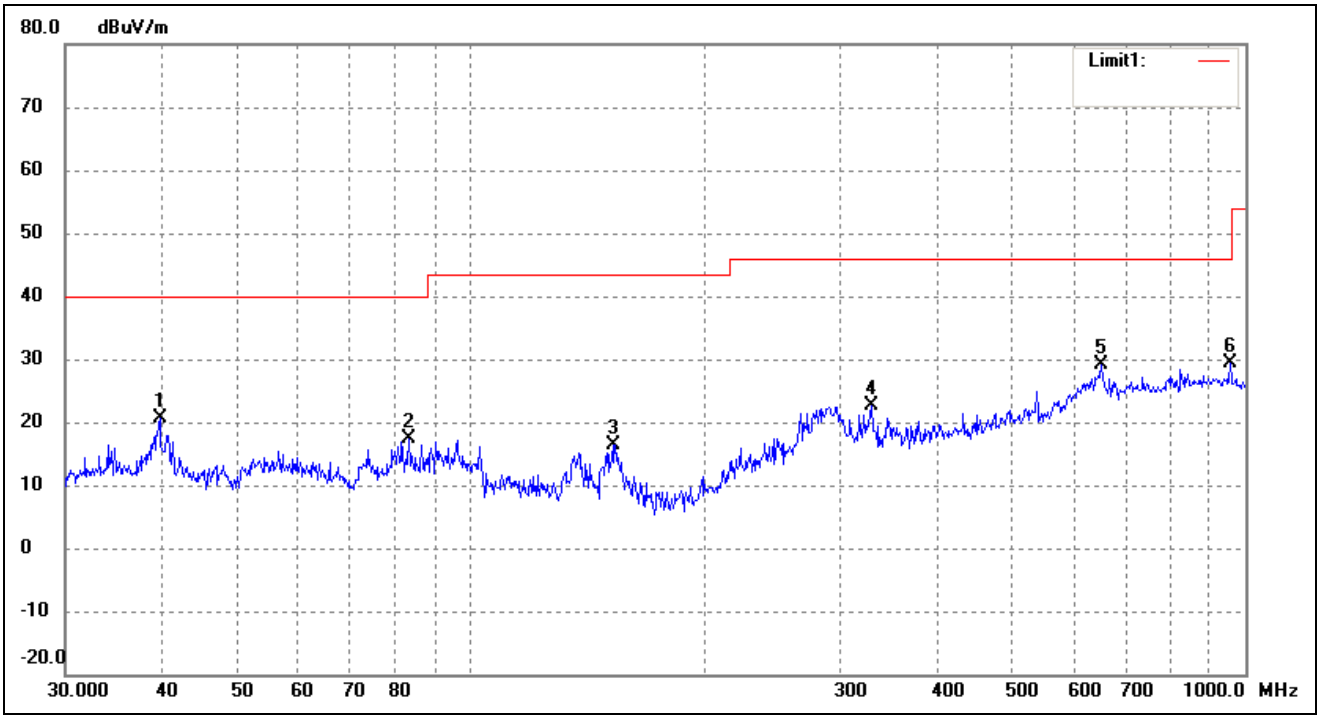


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.7518	34.57	-16.73	17.84	40.00	-22.16	275	100	peak
2	81.7832	37.85	-19.50	18.35	40.00	-21.65	99	100	peak
3	157.0073	32.65	-18.99	13.66	43.50	-29.84	232	100	peak
4	324.4560	28.48	-9.44	19.04	46.00	-26.96	113	100	peak
5	631.6884	29.17	-1.29	27.88	46.00	-18.12	353	100	peak
6	830.4002	30.60	-2.61	27.99	46.00	-18.01	323	100	peak

Plot of Radiated Emissions Test Data

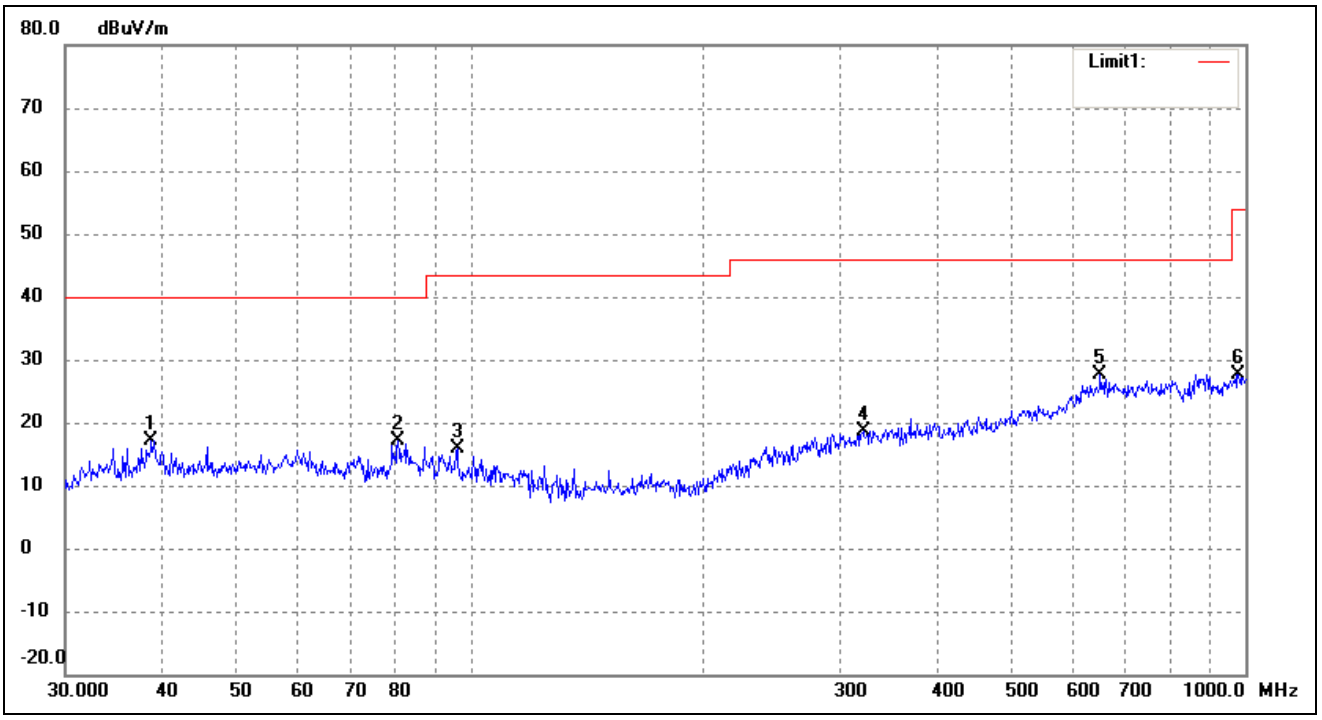
EUT: *Headphone*
Tested Model: *NT-Z3 Harmony*
Operating Condition: *Transmitting-Middle channel (2440MHz)*
Comment: *DC 3.7V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	39.7147	37.13	-16.57	20.56	40.00	-19.44	304	100	peak
2	83.2297	36.73	-19.25	17.48	40.00	-22.52	120	100	peak
3	152.6640	35.17	-18.84	16.33	43.50	-27.17	72	100	peak
4	329.0389	32.12	-9.50	22.62	46.00	-23.38	172	100	peak
5	651.9416	30.41	-1.32	29.09	46.00	-16.91	109	100	peak
6	955.4380	33.08	-3.70	29.38	46.00	-16.62	266	100	peak

Test Specification: *Vertical*

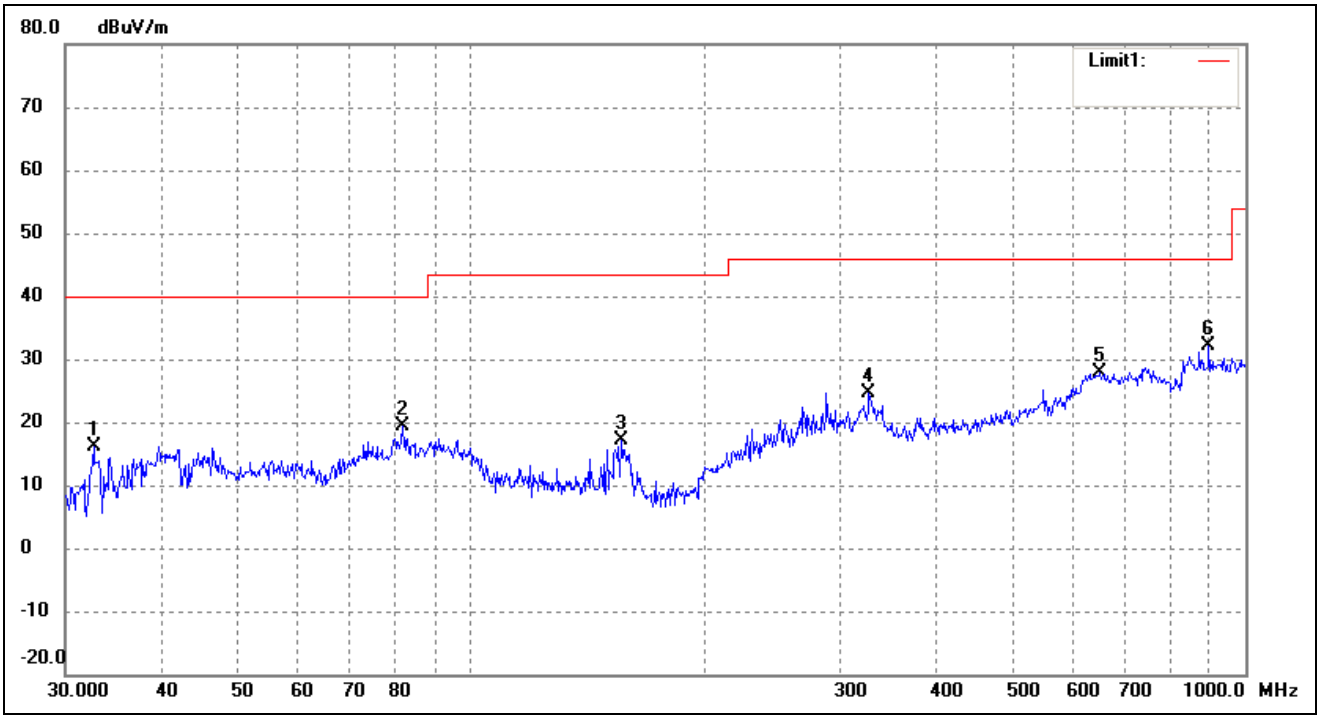


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	38.7518	33.78	-16.73	17.05	40.00	-22.95	203	100	peak
2	80.6441	36.76	-19.71	17.05	40.00	-22.95	228	100	peak
3	96.0986	32.93	-17.14	15.79	43.50	-27.71	74	100	peak
4	321.0607	28.10	-9.36	18.74	46.00	-27.26	174	100	peak
5	649.6597	28.87	-1.26	27.61	46.00	-18.39	147	100	peak
6	979.1803	31.16	-3.44	27.72	54.00	-26.28	250	100	peak

Plot of Radiated Emissions Test Data

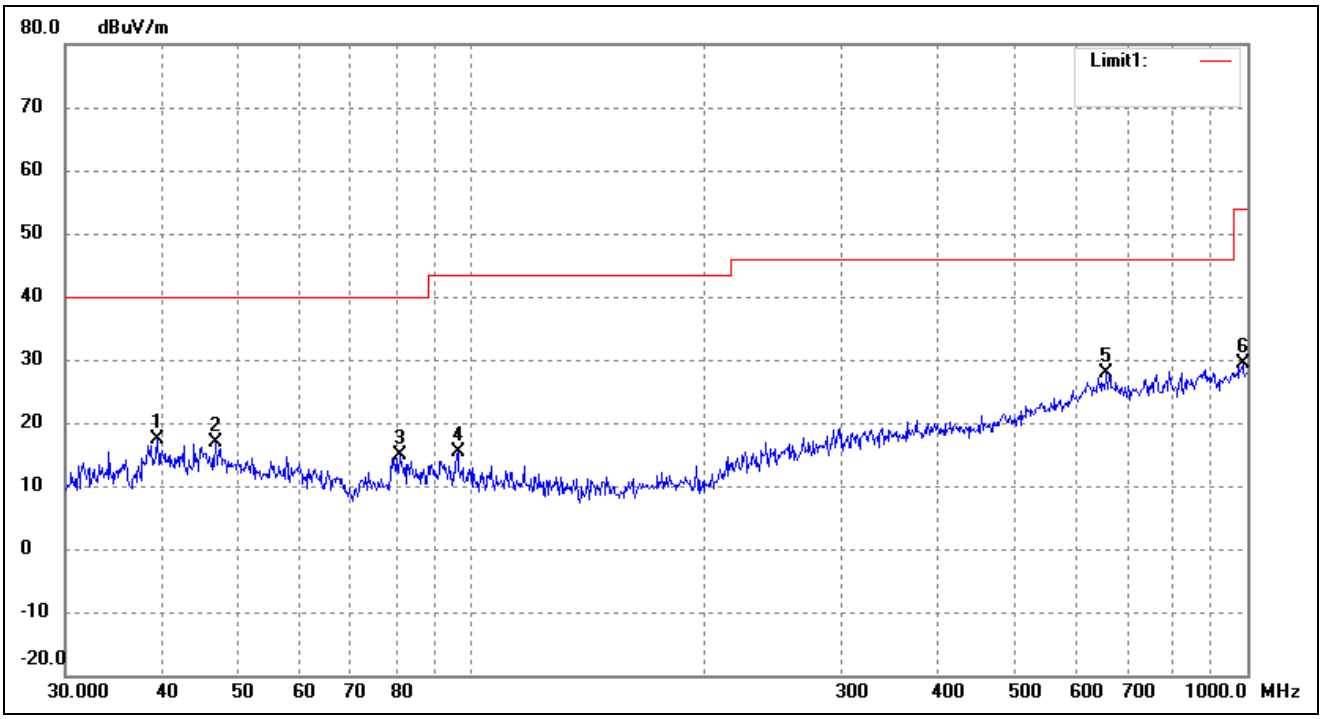
EUT: *Headphone*
Tested Model: *NT-Z3 Harmony*
Operating Condition: *Transmitting-High channel (2480MHz)*
Comment: *DC 3.7V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	32.6340	33.82	-17.71	16.11	40.00	-23.89	142	100	peak
2	81.7832	38.83	-19.50	19.33	40.00	-20.67	190	100	peak
3	156.4577	36.01	-18.97	17.04	43.50	-26.46	124	100	peak
4	326.7395	34.14	-9.47	24.67	46.00	-21.33	123	100	peak
5	649.6597	29.04	-1.26	27.78	46.00	-18.22	92	100	peak
6	896.9964	35.04	-2.86	32.18	46.00	-13.82	237	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	39.4371	33.98	-16.62	17.36	40.00	-22.64	79	100	peak
2	46.8303	33.28	-16.51	16.77	40.00	-23.23	199	100	peak
3	80.9274	34.49	-19.65	14.84	40.00	-25.16	82	100	peak
4	96.0986	32.64	-17.14	15.50	43.50	-28.00	134	100	peak
5	658.8361	29.33	-1.47	27.86	46.00	-18.14	198	100	peak
6	986.0716	32.13	-2.77	29.36	54.00	-24.64	341	100	peak

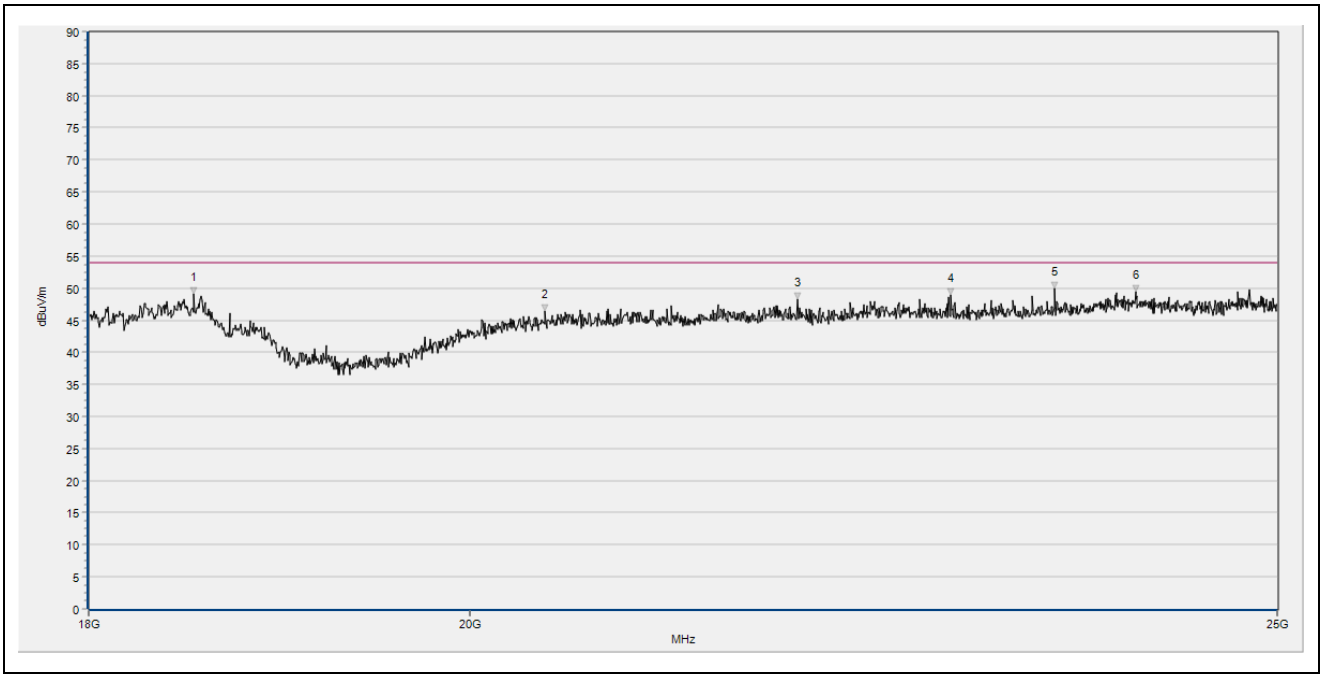
Spurious Emissions 1GHz to 18GHz

Transmitting: BLE mode:

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel-2402MHz							
4804	61.20	-3.59	57.61	74	-16.39	H	PK
4804	44.39	-3.59	40.80	54	-13.20	H	AV
7206	62.00	-0.52	61.48	74	-12.52	H	PK
7206	45.17	-0.52	44.65	54	-9.35	H	AV
4804	64.11	-3.59	60.52	74	-13.48	V	PK
4804	48.57	-3.59	44.98	54	-9.02	V	AV
7206	62.92	-0.52	62.40	74	-11.60	V	PK
7206	47.90	-0.52	47.38	54	-6.62	V	AV
Middle Channel-2440MHz							
4880	60.37	-3.49	56.88	74	-17.12	H	PK
4880	43.26	-3.49	39.77	54	-14.23	H	AV
7320	62.77	-0.47	62.30	74	-11.70	H	PK
7320	46.04	-0.47	45.57	54	-8.43	H	AV
4880	64.94	-3.49	61.45	74	-12.55	V	PK
4880	52.43	-3.49	48.94	54	-5.06	V	AV
7320	61.49	-0.47	61.02	74	-12.98	V	PK
7320	48.46	-0.47	47.99	54	-6.01	V	AV
High Channel-2480MHz							
4960	60.00	-3.41	56.59	74	-17.41	H	PK
4960	43.66	-3.41	40.25	54	-13.75	H	AV
7440	58.85	-0.42	58.43	74	-15.57	H	PK
7440	44.12	-0.42	43.70	54	-10.30	H	AV
4960	59.83	-3.41	56.42	74	-17.58	V	PK
4960	48.57	-3.41	45.16	54	-8.84	V	AV
7440	62.64	-0.42	62.22	74	-11.78	V	PK
7440	48.45	-0.42	48.03	54	-5.97	V	AV

Operating Condition: *Transmitting-High channel (2480MHz)_worst case*

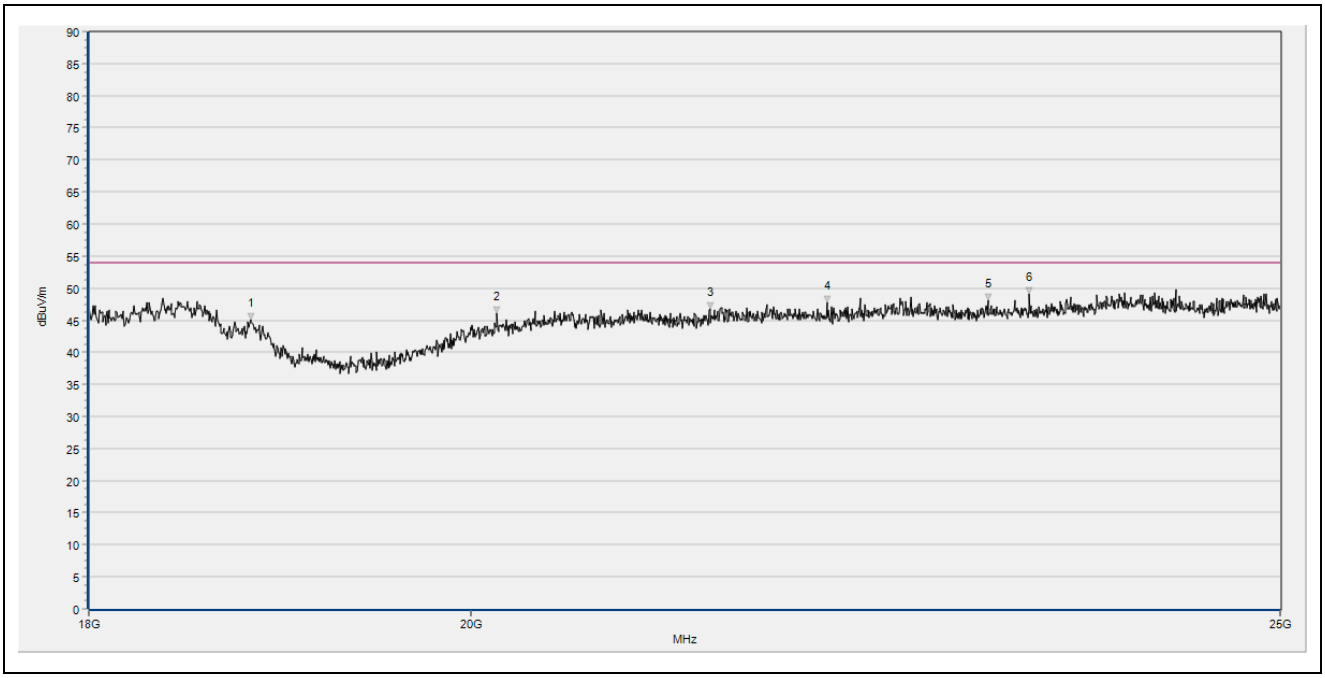
Spurious Emissions above 18GHz
Test Specification: *Horizontal*



Num	Freq(MHz)	PK	limit AV	Degree	Antenna	Verdict
1	18531.333	49.19	54.00	145.9	H	PASS
2	20421.422	46.42	54.00	77.8	H	PASS
3	21896.017	48.31	54.00	20.5	H	PASS
4	22845.135	48.93	54.00	77.8	H	PASS
5	23509.111	49.87	54.00	339.8	H	PASS
6	24038.662	49.38	54.00	193.8	H	PASS

Operating Condition: *Transmitting-High channel (2480MHz)_worst case*

Spurious Emissions above 18GHz
Test Specification: *Vertical*



Num	Freq(MHz)	PK	limit AV	Degree	Antenna	Verdict
1	18820.549	45.01	54.00	38.7	V	PASS
2	20144.426	46.17	54.00	307.9	V	PASS
3	21362.393	46.68	54.00	97.0	V	PASS
4	22063.030	47.85	54.00	202.7	V	PASS
5	23065.103	48.13	54.00	356.0	V	PASS
6	23329.878	49.15	54.00	67.6	V	PASS

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics,

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Procedure

According to the KDB 558074 D01 v04, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 v04, the conducted spurious emissions test method as follows:
1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW ≥ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

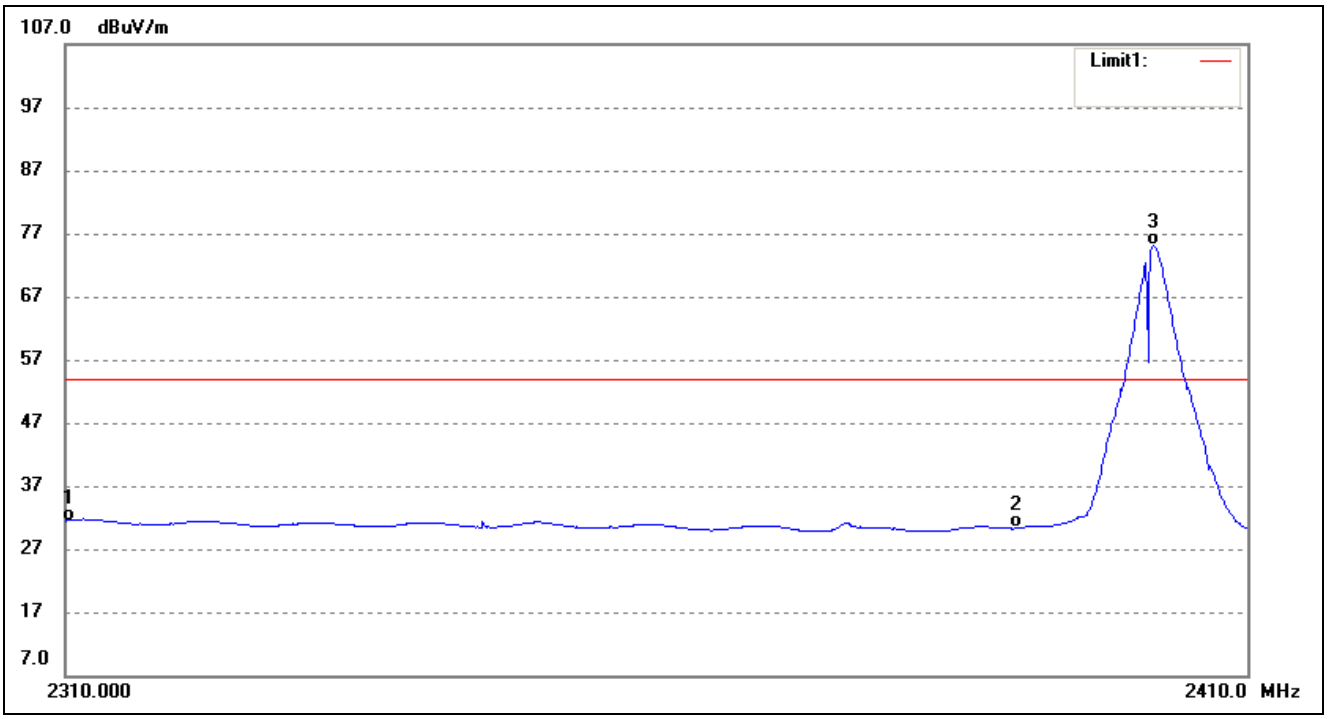
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.3 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

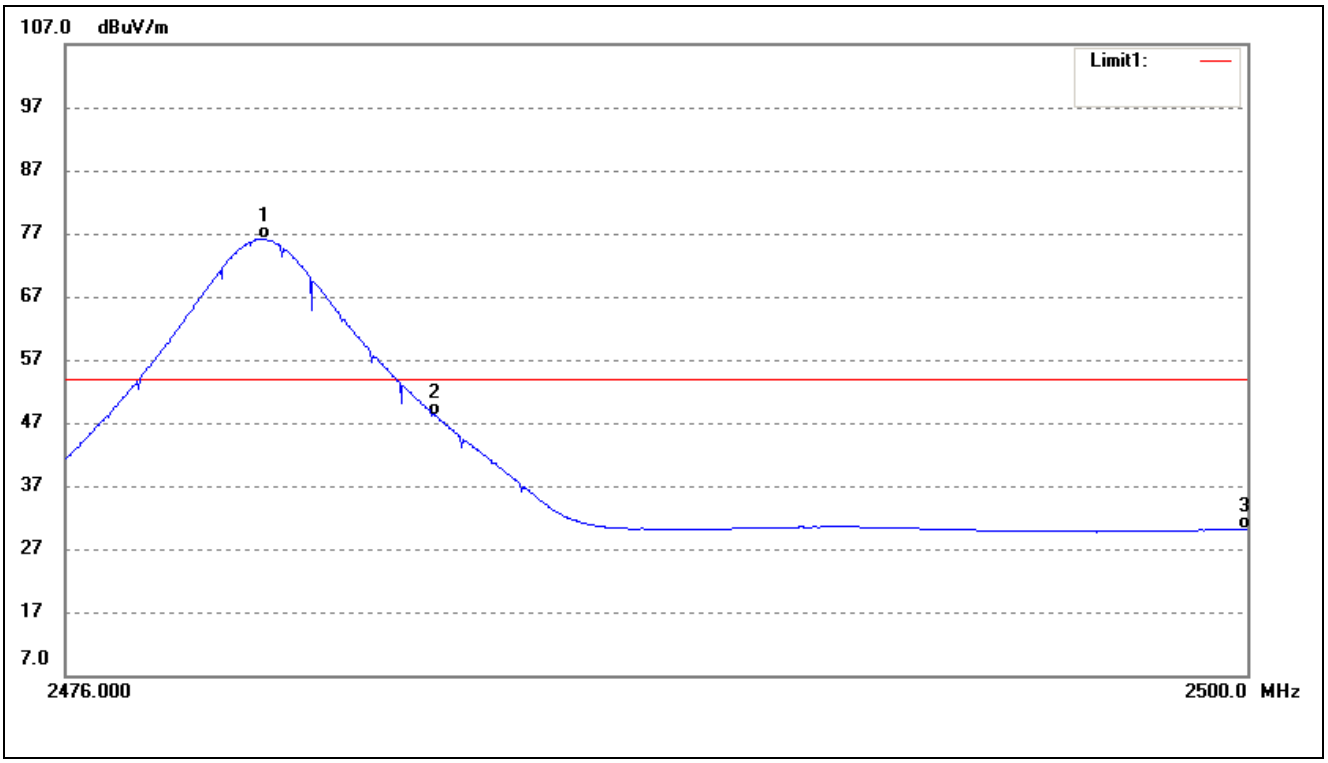
9.4 Summary of Test Results/Plots

Bandedge (Radiated)
Lowest Bandedge-BLE
Horizontal (Worst case)



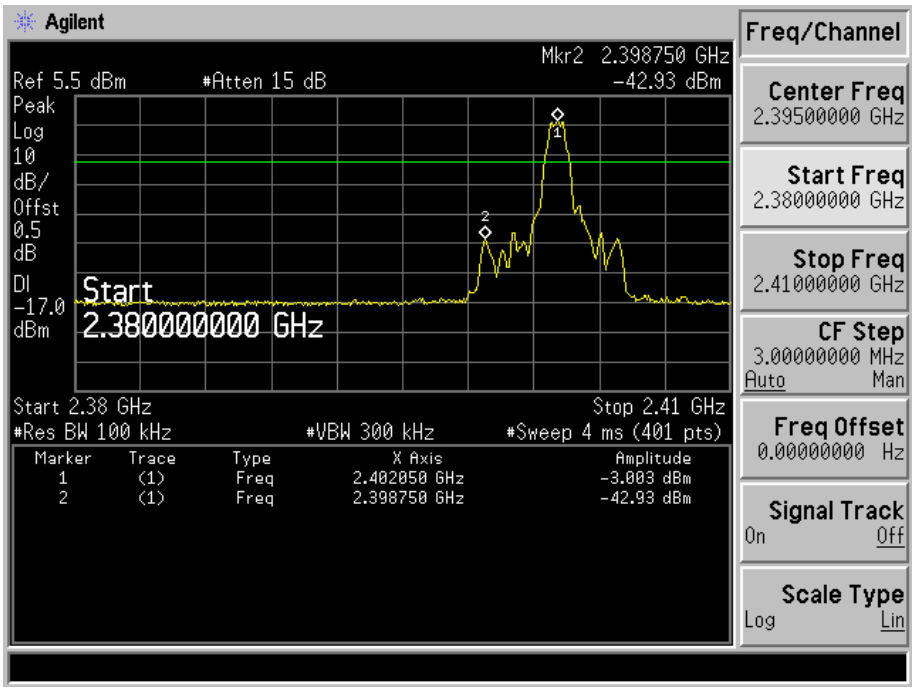
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.00	37.84	-6.38	31.46	54.00	-22.54	Average Detector
	2310.00	53.45	-6.38	47.07	74.00	-26.93	Peak Detector
2	2390.00	37.54	-7.26	30.28	54.00	-23.72	Average Detector
	2390.00	52.71	-7.26	45.45	74.00	-28.55	Peak Detector
3	2401.84	82.46	-7.39	75.07	/	/	Average Detector
	2402.15	106.57	-7.39	99.18	/	/	Peak Detector

Highest Bandedge-BLE
Horizontal (Worst case)

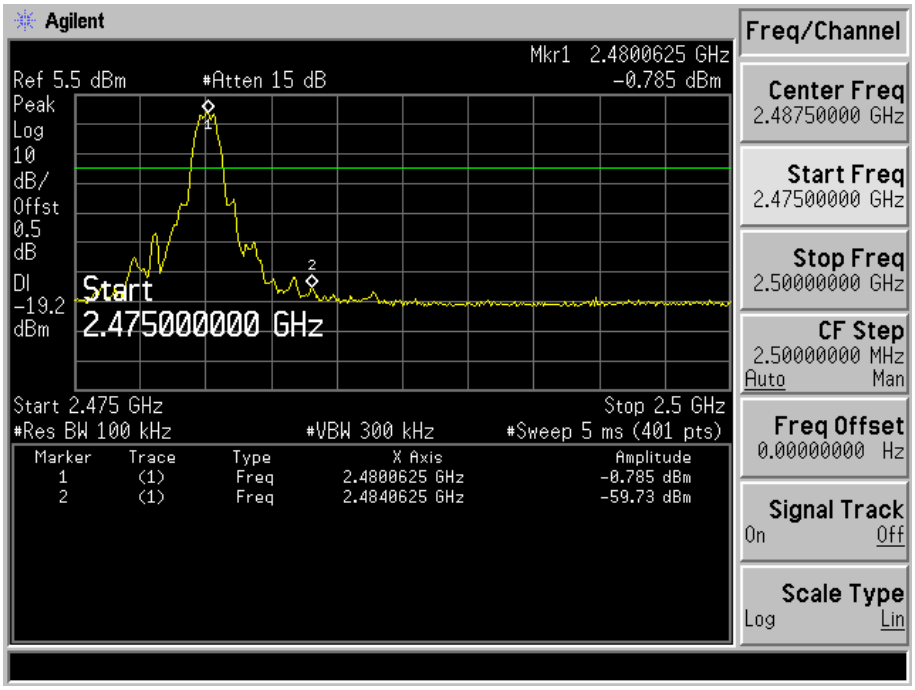


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.02	83.45	-7.28	76.17	/	/	Average Detector
	2480.23	107.36	-7.28	100.08	/	/	Peak Detector
2	2483.50	55.29	-7.28	48.01	54.00	-5.99	Average Detector
	2483.50	69.82	-7.28	62.54	74.00	-11.46	Peak Detector
3	2500.00	37.49	-7.25	30.24	54.00	-23.76	Average Detector
	2500.00	58.14	-7.25	50.89	74.00	-23.11	Peak Detector

Bandedge (Conducted)
Lowest



High Channel:

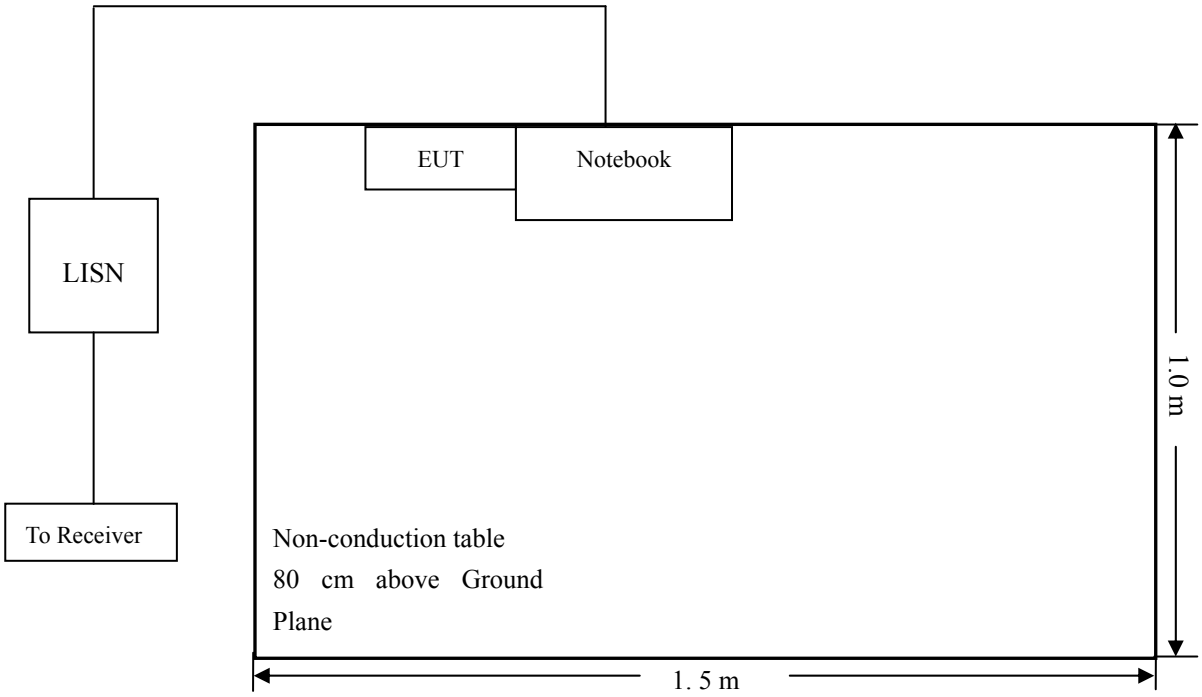


10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.

10.2 Basic Test Setup Block Diagram



10.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

10.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed ..... Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth ..... 9 kHz
Quasi-Peak Adapter Mode ..... Normal

10.5 Summary of Test Results/Plots

According to the data in section 10.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

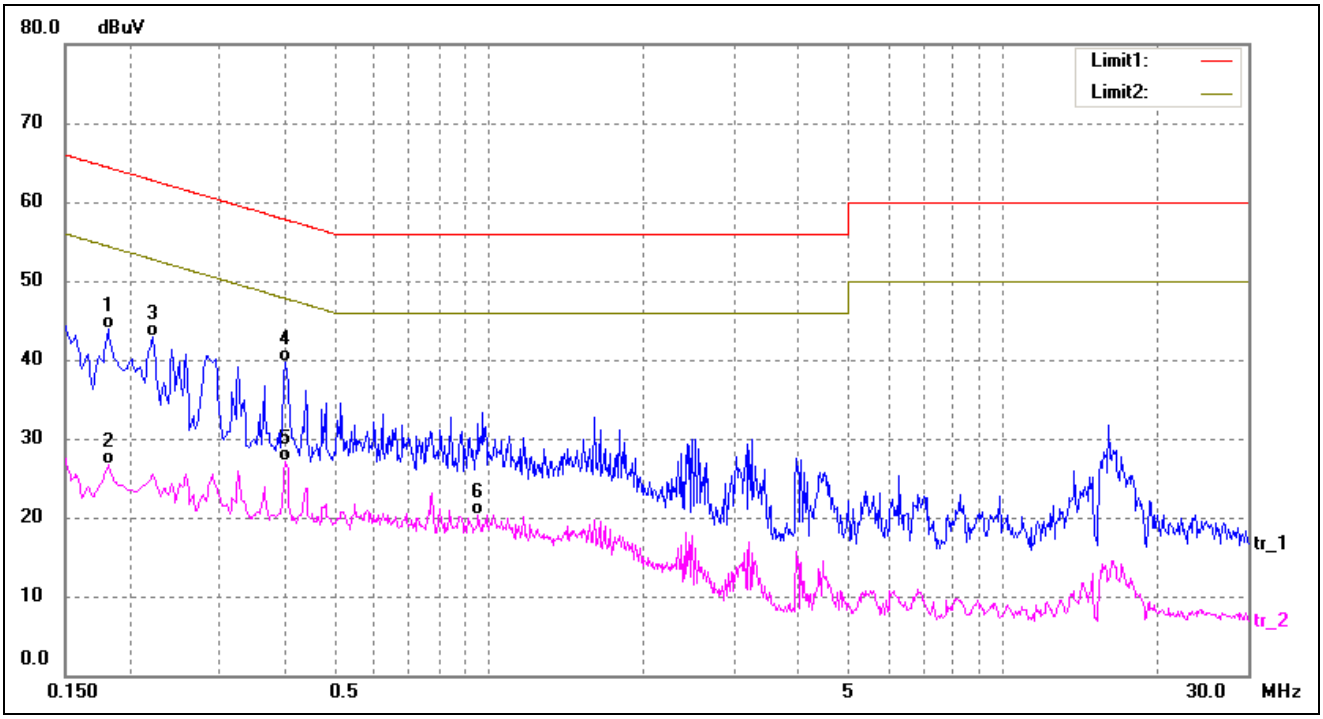
-15.57 dB at 0.4060 MHz in the **Line** mode**, AVG** detector, **0.15-30MHz**

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

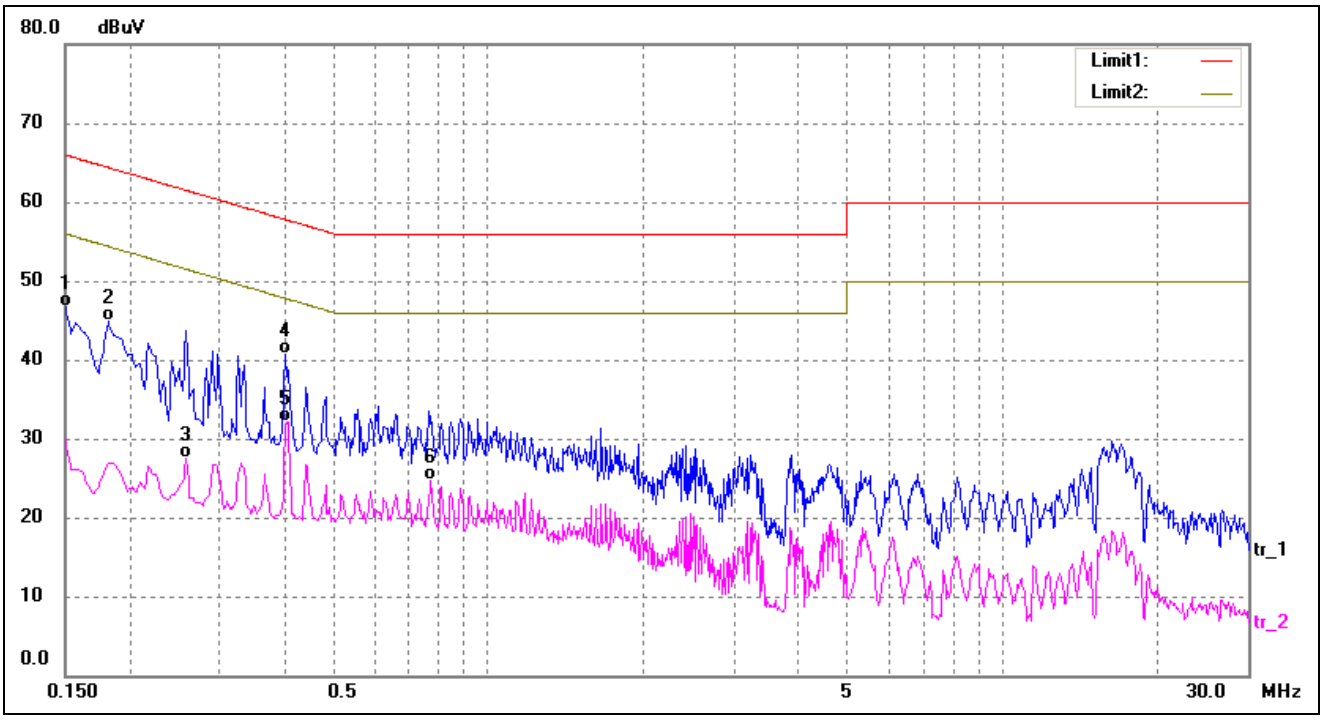
EUT: *Headphone*
Tested Model: *NT-Z3 Harmony*
Operating Condition: *Transmitting*
Comment: *Adapter AC 120V/60Hz_worst case*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1820	34.12	9.82	43.94	64.39	-20.45	QP
2	0.1820	16.83	9.82	26.65	54.39	-27.74	AVG
3	0.2220	33.14	9.80	42.94	62.74	-19.80	QP
4*	0.4020	29.98	9.80	39.78	57.81	-18.03	QP
5	0.4020	17.30	9.80	27.10	47.81	-20.71	AVG
6	0.9540	10.62	9.76	20.38	46.00	-25.62	AVG

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1500	36.85	9.85	46.70	66.00	-19.30	QP
2	0.1820	35.05	9.82	44.87	64.39	-19.52	QP
3	0.2580	17.61	9.80	27.41	51.50	-24.09	AVG
4	0.4020	30.92	9.80	40.72	57.81	-17.09	QP
5*	0.4060	22.36	9.80	32.16	47.73	-15.57	AVG
6	0.7740	14.98	9.78	24.76	46.00	-21.24	AVG

******* END OF REPORT *******