

FCC RF Test Report

(Bluetooth)

Applicant: Shenzhen DOOGEE Hengtong Technology CO., LTD

Address of Applicant: B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park,
No. 22, Dafu Industrial Zone, Guanlan Aobei Community,
Guanlan Street, Longhua New District, Shenzhen, Guangdong
China

Product Name: Portable Wireless Speaker

Model No.: MS02 (More models are listed in Section 2.2)

Brand Name: DOOGEE, DOOGEE Eco

FCC ID: 2AX4YMS02

Test Standards: FCC CFR Title 47 Part 15C (§15.247)

Date of Sample Receipt: May 25, 2026

Date of Test: May 26 to Jun. 03, 2026

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Prepared By:

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Report Revision History

Rev.	Issue Date	Description
V00	Jun. 04, 2026	Initial Release



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1 Laboratory Introduction

1.1 Laboratory Location

Company Name:	Shenzhen Acote Technology Co., Ltd.
Address of Laboratory:	Room 719, Excellence Times Building, No. 27, Xinqiao 3rd Road, Xinqiao Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong Province, China.
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Website:	www.acotelabs.com
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1.2 Laboratory Facility

Our company's laboratory facilities have received accreditation, certification, or authorization from the following organizations:

- **FCC - Designation No.: CN1450**
Shenzhen Acote Technology Co., Ltd. has been certified by the FCC (Federal Communications Commission) as a testing laboratory. Test Firm Registration Number: **832670**.
- **ISED - CAB Identifier: CN0202**
Shenzhen Acote Technology Co., Ltd. is registered with ISED (Innovation, Science and Economic Development Canada) as a Conformity Assessment Body (CAB) for radio equipment testing.
- **A2LA - Accreditation Number: 7697.01**
Shenzhen Acote Technology Co., Ltd. has been accredited by A2LA (American Association for Laboratory Accreditation) in compliance with the internationally recognized standard ISO/IEC 17025:2017, "General Requirements for the Competence of Testing and Calibration Laboratories."

1.3 Announcement

Shenzhen Acote Technology Co., Ltd. tested the equipment in accordance with the requirements set forth in the test standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by Shenzhen Acote Technology Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Shenzhen Acote Technology Co., Ltd. will constitute fraud and shall nullify the document.

1.4 Disclaimer

For the information or data provided by the client in this report, the relevant results or conclusions of this report are only made for these data or information. The testing laboratory is not responsible for the authenticity and accuracy of these data or information.

2 Equipment Under Test Information

2.1 Application Information

Applicant:	Shenzhen DOOGEE Hengtong Technology CO., LTD
Address of Applicant:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22, Dafu Industrial Zone, Guanlan Aobei Community, Guanlan Street, Longhua New District, Shenzhen, Guangdong China
Manufacturer:	Shenzhen DOOGEE Hengtong Technology CO., LTD
Address of Manufacturer:	B, 2/F, Building A4, Silicon Valley Power Digital Industrial Park, No. 22, Dafu Industrial Zone, Guanlan Aobei Community, Guanlan Street, Longhua New District, Shenzhen, Guangdong China
Factory:	Shenzhen Xinyicheng Acoustic Electronics Co., Ltd
Address of Factory:	8F Rongshengda Industrial Park, LiaoKeng, Langxin, Shiyan, BaoAn, Shenzhen, China

2.2 Product Information

Product Name:	Portable Wireless Speaker
Model No.:	MS02
Models of Product Family:	MS03, MS05, MS06, MS07, MS08
Description of Model Differentiation:	This product series includes a total of 6 models. All models share an identical RF design, including the same RF chipset, RF circuit design, PCB layout, antenna type, antenna location, and antenna gain. The only difference is the model name.
Hardware Version:	V02
Software Version:	V01

2.3 EUT Technical Parameters

Operation Frequency:	2402 MHz ~ 2480 MHz
Modulation Technology:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	☒ GFSK ☒ $\pi/4$ -DQPSK ☒ 8DPSK
Data Speed:	☒ 1 Mbps ☒ 2 Mbps ☒ 3 Mbps
Channel Numbers:	79
Antenna Type:	Inverted F Antenna
Antenna Gain:	-0.58 dBi (declared by applicant)
Power Supply:	Rechargeable Li-ion Battery 11.10Vdc, 2000mAh
External Power Supply:	DC 5.0V
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

3 Test Information

3.1 Test Methodology

The tests documented in this report were performed in accordance with:

- FCC CFR Title 47 Part 2
- FCC CFR Title 47 Part 15C (§15.247)
- ANSI C63.10:2020
- KDB 558074 D01 15.247 Meas Guidance v05r02

3.2 Test Result Summary

Report Section	Test Items	Standard Clause	Test Result
5.1	Antenna Requirement	§15.203 §15.247 (b)(4)	Pass
5.2	AC Power Line Conducted Emission	§15.207	Pass
5.3	20dB Occupied Bandwidth	§15.247 (a)(1)	Pass
5.4	Conducted Output Power	§15.247 (b)(1)	Pass
5.5	Carrier Frequencies Separation	§15.247 (a)(1)	Pass
5.6	Hopping Channel Number	§15.247 (a)(1)(iii)	Pass
5.7	Dwell Time	§15.247 (a)(1)(iii)	Pass
5.8	Band-edge Emission	§15.247 (d)	Pass
5.9	Conduction Spurious Emission	§15.247 (d)	Pass
5.10	Emissions in Restricted Frequency Bands	§15.205 §15.247 (d)	Pass
5.11	Emissions in Non-restricted Frequency Bands	§15.209 §15.247(d)	Pass
Remark: a) <i>Pass: The EUT complies with the essential requirements in the standard.</i> b) <i>N/A: Not applicable.</i> c) <i>The test cable insertion loss used for RF output power and other conducted measurements is provided by the applicant.</i>			

3.3 Environment of test site

Temperature:	15 ~ 35°C
Humidity:	20 ~ 75% RH
Atmospheric Pressure:	990 ~ 1010 mbar

3.4 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Radio Frequency	$\pm 2 \times 10^{-8}$
RF Power, Conducted	± 0.66 dB
Spurious emission, Conducted	± 2.28 dB
Bandwidth, Conducted	$\pm 4\%$
Temperature	± 0.3 °C
Voltage	± 0.1 %
Humidity	± 2 %
Conducted Emission (9kHz ~ 150kHz)	± 3.02 dB
Conducted Emission (30MHz ~ 1000MHz)	± 2.52 dB
Radiated Emission (30MHz ~ 1000MHz) (3m SAC)	± 4.78 dB
Radiated Emission (1GHz ~ 6GHz) (3m SAC)	± 5.16 dB
Radiated Emission (6GHz ~ 18GHz) (3m SAC)	± 5.48 dB
Radiated Emission (18GHz ~ 40GHz) (3m SAC)	± 5.48 dB
Note: All the measurement uncertainty value were shown with a coverage $k=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.	

3.5 Description of Support Units

Description	Model	Manufacturer	Serial Number
Laptop	ThinkPad X1 Carbon 7th	Lenovo	PF-28E6G9 20/08
Power Adapter	U700TSA	TECNO	KX07019243B13

3.6 Additions to, Deviations, or Exclusions from the Method

None

3.7 Test Instruments List

Radiated Emission(3m SAC)				
Test Equipment	Manufacturer	Model	Serial No.	Cal Due
3m SAC	YiHeng	9m*6m*6m	20250422	2028/05/28
EMI Test Receiver	Rohde & Schwarz	ESR7	101542	2026/08/31
TRILOG Broad Band Antenna (30MHz – 1000MHz)	Schwarzbeck	VULB 9168	9168-771	2026/09/08
6dB Attenuator	SRTechnology Corporate	N-ATTENUATOR(6dB)	311248	2026/08/31
Preamplifier (30MHz – 1000MHz)	TESTEK	TK-PA06S	190014-L	2026/08/31
Broadband Horn Antenna (1GHz – 18GHz)	Gwave Technology	GHA0118A-11	20251014010	2026/11/16
Preamplifier (1GHz – 18GHz)	Gwave Technology	GWLAN008018-50	20251014010	2026/10/23
Broadband Horn Antenna (18GHz – 40GHz)	Gwave Technology	GHA180400-292F-20	20251014010	2026/11/16
Preamplifier (18GHz – 40GHz)	Gwave Technology	GWLAN018040-45	20251014010	2026/10/23
RF Cable (9kHz – 18GHz)	REBES	SF104/10000MM	805225/4	2026/08/31
RF Cable (9kHz – 18GHz)	REBES	SF104/10000MM	805226/4	2026/08/31
RF Cable (18GHz – 40GHz)	MWRFTest	UCA400-2.92M2092M-1.5M	004	2026/10/23
RF Cable (18GHz – 40GHz)	Gwave Technology	GAU3-292M292M-3000A1	20251021001-01-01	2026/10/23
RF Cable (18GHz – 40GHz)	Gwave Technology	GAU3-292M292M-600A1	20251021001-01-01	2026/10/23
High-pass filter (1GHz – 18GHz)	K&L MICROWAVE	11SH10-2000/U1800-O/O	350	2026/10/23
High-pass filter (3GHz – 18GHz)	UIY	UIYHPF3025A4T18SF	DL0019131	2026/10/23
High-pass filter (7GHz – 18GHz)	Narda	F4036A	1572	2026/10/23
Spectrum Analyzer	Rohde & Schwarz	FSP40	102129	2026/07/04
Test Software	Frad	EZ EMC	Version: EMEC-3A1	N/A

Conducted Emission				
Test Equipment	Manufacturer	Model	Serial No.	Cal Due
EMI Test Receiver	Rohde & Schwarz	ESR3	101763	2026/08/31
TWO-LINE V-NETWORK	Rohde & Schwarz	ENV216	101078	2026/08/31
RF Cable (9kHz – 30MHz)	REBES	WG4R-60-60-3	210305	2026/08/31
Test Software	Frad	EZ_EMC	Version: EMEC-3A1	N/A

RF Conducted Measurement				
Test Equipment	Manufacturer	Model	Serial No.	Cal Due
Spectrum Analyzer	Keysight	N9020A	MY56060179	2026/11/13
Vector Signal Generator	Agilent	N5182A	MY49060467	2026/11/13
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	123351	2026/11/13
Automatic control unit (including power sensor)	MWRFTTest	MW100-RFCB	MW250722AKT-59	2026/11/13
BT/WiFi automated testing software	MWRFTTest	MTS8310	Version: 2.0.0.0	N/A

4 Test Configuration of EUT

4.1 Channels Selected to Perform the Tests

Channels	Channel No.	Frequency (MHz)
Lowest	0	2402
Middle	39	2441
Highest	78	2480

4.2 Test Mode

TM 1:	Keep the EUT in continuously transmitting mode
TM 2:	Keep the EUT in hopping mode

4.3 Worst-case Configuration

The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. The details are as follows:

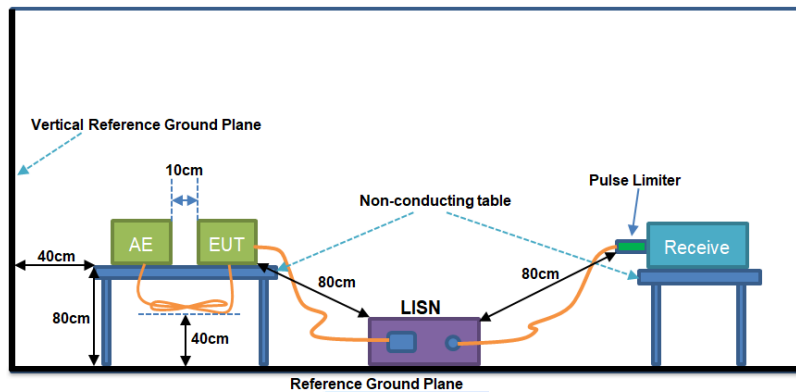
Report Section	Test Channel	Test Mode	Modulation Type
5.2	/	TM 1	1-DH5, 2-DH5, 3-DH5
5.3	L, M, H	TM 1	
5.4	L, M, H	TM 1	
5.5	Hopping	TM 2	
5.6	Hopping	TM 2	
5.7	Hopping	TM 2	1-DH1, 1-DH3, 1-DH5 2-DH1, 2-DH3, 2-DH5 3-DH1, 3-DH3, 3-DH5
5.8	L, H	TM 1	1-DH5, 2-DH5, 3-DH5
	Hopping	TM 2	
5.9	L, M, H	TM 1	
5.10	L, H	TM 1	
5.11	L, M, H	TM 1	

Note:

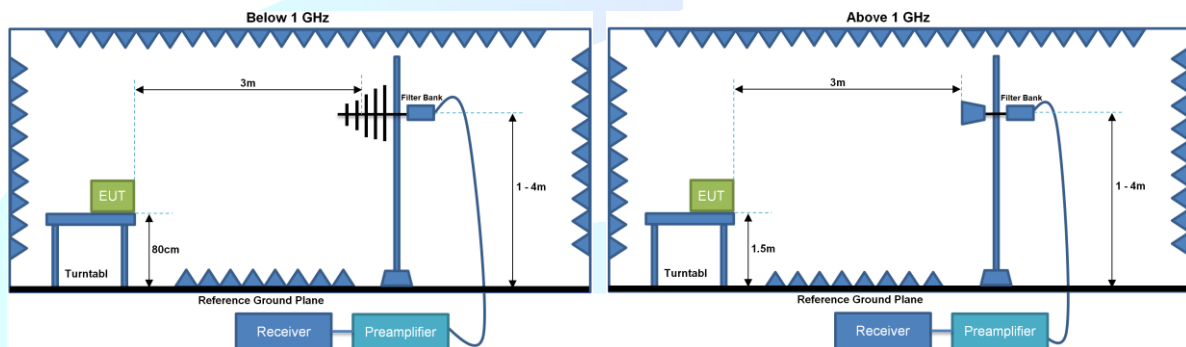
- 1) The EUT was investigated in three orthogonal orientations X, Y and Z, it was determined that Y was the worst-case of radiated field strength.
- 2) For Section 5.2, only the modulation type and the channel corresponding to the highest output power were tested.
- 3) For the 30 MHz to 1000 MHz range in Section 5.11, only the modulation type and the channel corresponding to the highest output power were tested.
- 4) For frequencies above 1 GHz in Section 5.11, measurements were performed up to the 10th harmonic of the fundamental frequency (or up to 40 GHz). Frequencies with emission levels at least 20 dB below the limit are not presented in the test report.

4.4 Test Setup Block

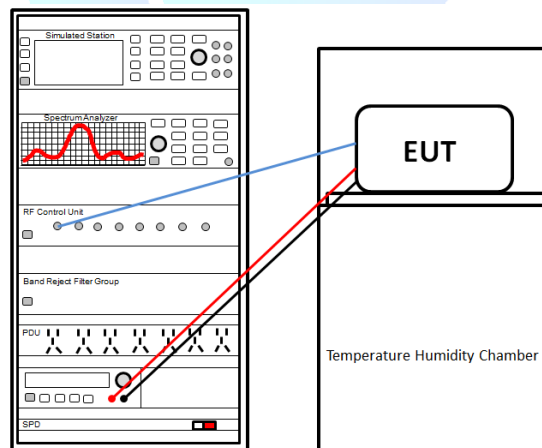
Setup 1 (Conducted Emission):



Setup 2 (Radiated Emission):



Setup 3 (MTS8310 Testing System):



5 Technical requirements specification

5.1 Antenna Requirement

5.1.1 Requirement

15.203 Requirement:

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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) Requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.1.2 Results

Pass.

The Bluetooth antenna is an inverted F antenna which permanently attached, and the best case gain of the antenna is -0.58 dBi. See product internal photos for details.

5.2 AC Power Line Conducted Emission

5.2.1 Limits

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 1}
0.5 – 5	56	46
5 – 30	60	50
Note 1: The limit level in dB μ V decreases linearly with the logarithm of frequency.		
Note 2: The more stringent limit applies at transition frequencies.		

5.2.2 Test Procedure

- The EUT was placed on a non-conductive table, 40 cm from the vertical ground plane and 80 cm from the horizontal ground plane. The EUT was arranged in accordance with ANSI C63.10.
- The EUT was configured to operate in TM 1 mode as specified in Section 4.2. The test channels and modulation types of the EUT are described in Section 4.3.
- The phase of the LISN was set to L1.
- Open the test software, load the conducted emission test script, or create a new conducted emission test script, and configure the test parameters, including the test frequency range, RBW = 9kHz, VBW = 30kHz, test standard, LISN, receiver, and other related settings.
- The test script was executed, the measurement was performed. Save the test data.
- The phase of the LISN was set to N, and steps d) and e) were repeated.

5.2.3 Test Setup

See setup 1 in section 4.4.

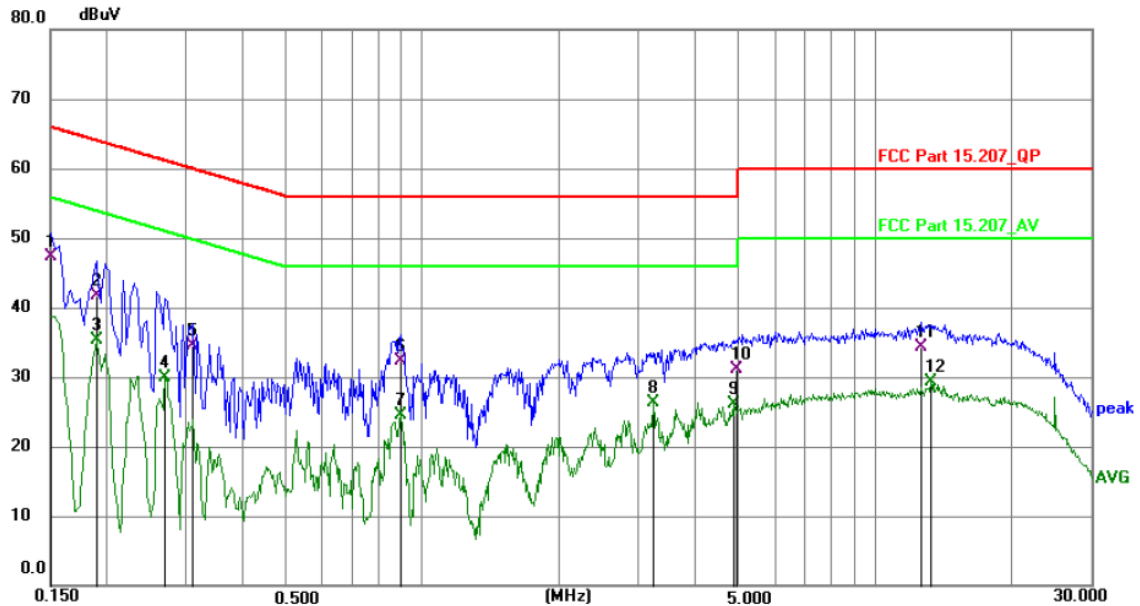
5.2.4 Test Instruments

Refer to section 3.7.

5.2.5 Test Results

Pass.

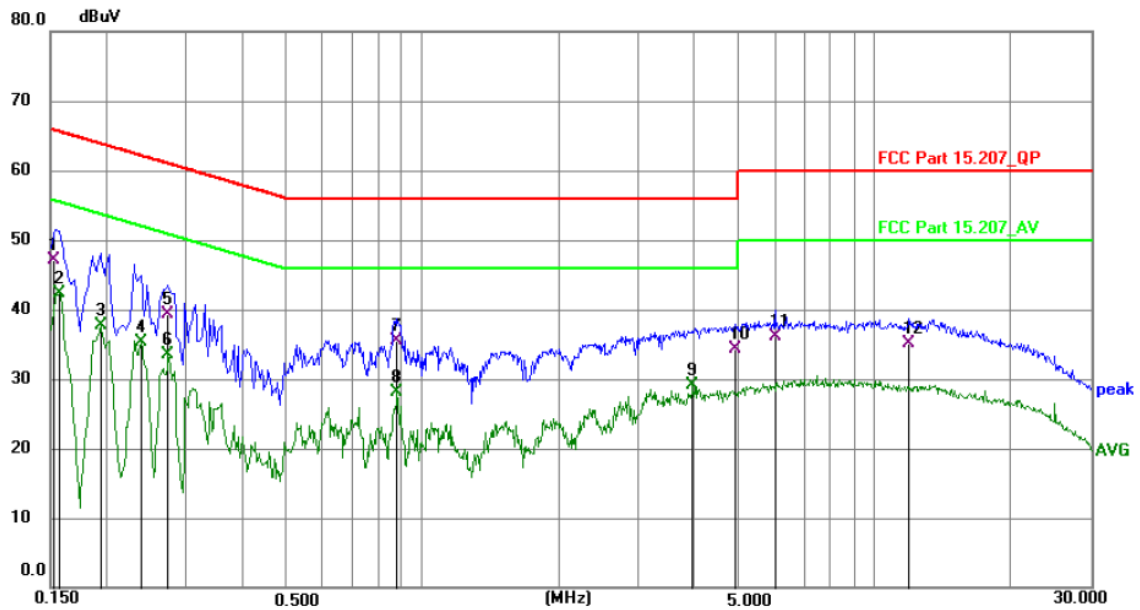
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Tom Ye	Test Mode:	TM 1
Test Frequency:	150kHz ~ 30MHz	Phase:	Line
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1500	37.56	9.69	47.25	66.00	-18.75	QP	P
2	0.1900	32.14	9.66	41.80	64.04	-22.24	QP	P
3 *	0.1900	25.64	9.66	35.30	54.04	-18.74	AVG	P
4	0.2700	20.29	9.64	29.93	51.12	-21.19	AVG	P
5	0.3100	24.84	9.64	34.48	59.97	-25.49	QP	P
6	0.8940	22.63	9.59	32.22	56.00	-23.78	QP	P
7	0.8940	14.88	9.59	24.47	46.00	-21.53	AVG	P
8	3.2380	16.68	9.58	26.26	46.00	-19.74	AVG	P
9	4.8540	16.50	9.61	26.11	46.00	-19.89	AVG	P
10	4.9380	21.45	9.61	31.06	56.00	-24.94	QP	P
11	12.6540	24.69	9.68	34.37	60.00	-25.63	QP	P
12	13.3340	19.71	9.68	29.39	50.00	-20.61	AVG	P

Remark: Level = Read level + LISN Factor + Cable Loss.

Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Tom Ye	Test Mode:	TM 1
Test Frequency:	150kHz ~ 30MHz	Phase:	Neutral
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1539	37.45	9.69	47.14	65.79	-18.65	QP	P
2 *	0.1580	32.68	9.68	42.36	55.57	-13.21	AVG	P
3	0.1940	28.09	9.65	37.74	53.86	-16.12	AVG	P
4	0.2380	25.63	9.64	35.27	52.17	-16.90	AVG	P
5	0.2740	29.75	9.64	39.39	61.00	-21.61	QP	P
6	0.2740	23.90	9.64	33.54	51.00	-17.46	AVG	P
7	0.8780	25.84	9.59	35.43	56.00	-20.57	QP	P
8	0.8780	18.49	9.59	28.08	46.00	-17.92	AVG	P
9	3.9580	19.51	9.59	29.10	46.00	-16.90	AVG	P
10	4.9180	24.65	9.61	34.26	56.00	-21.74	QP	P
11	5.9940	26.51	9.62	36.13	60.00	-23.87	QP	P
12	11.9060	25.46	9.67	35.13	60.00	-24.87	QP	P

Remark: Level = Read level + LISN Factor + Cable Loss.

5.3 20dB Occupied Bandwidth

5.3.1 Limits

N/A. Within authorization band.

5.3.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 1 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.3.3 Test Setup

See setup 3 in section 4.4.

5.3.4 Test Instruments

Refer to section 3.7.

5.3.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.4 Conducted Output Power

5.4.1 Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

5.4.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 1 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.4.3 Test Setup

See setup 3 in section 4.4.

5.4.4 Test Instruments

Refer to section 3.7.

5.4.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.5 Carrier Frequencies Separation

5.5.1 Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.5.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 2 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.5.3 Test Setup

See setup 3 in section 4.4.

5.5.4 Test Instruments

Refer to section 3.7.

5.5.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.6 Hopping Channel Number

5.6.1 Limits

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

5.6.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 2 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.6.3 Test Setup

See setup 3 in section 4.4.

5.6.4 Test Instruments

Refer to section 3.7.

5.6.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.7 Dwell Time

5.7.1 Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

5.7.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 2 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.7.3 Test Setup

See setup 3 in section 4.4.

5.7.4 Test Instruments

Refer to section 3.7.

5.7.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.8 Band-edge Emission

5.8.1 Limits

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.

5.8.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 1 and TM 2 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.8.3 Test Setup

See setup 3 in section 4.4.

5.8.4 Test Instruments

Refer to section 3.7.

5.8.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.9 Conduction Spurious Emission

5.9.1 Limits

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.

5.9.2 Test Procedure

- a) The EUT antenna port is connected to the RF port of the test system control unit via an RF cable.
- b) The EUT is set to operate in TM 1 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- c) Open the test software, load the BT test script, and select the test items and other relevant test parameters.
- d) The test script was executed, the measurement was performed.
- e) Save the test data.

5.9.3 Test Setup

See setup 3 in section 4.4.

5.9.4 Test Instruments

Refer to section 3.7.

5.9.5 Test Results

Pass.

For detailed test data, see Appendix – BT.

5.10 Emissions in Restricted Frequency Bands

5.10.1 Limits

Frequency (MHz)	Limits (dB μ V/m) at 3m	Detector
30 - 88	40.0	Quasi-peak
88 - 216	43.5	Quasi-peak
216 - 960	46.0	Quasi-peak
960 - 1000	54.0	Quasi-peak
Note: The more stringent limits applies at transition frequencies.		
Frequency (MHz)	Limits (dB μ V/m) at 3m	
	Average	Peake
Above 1GHz	54.0	74.

5.10.2 Test Procedure

- The EUT is placed on a non-conducting table of the 3m SAC turntable, 80 cm above the ground plane for measurement below 1GHz, 1.5 m above the ground plane for measurement above 1GHz. The measurement receiving antenna to EUT distance is 3 meters. The EUT was arranged in accordance with ANSI C63.10.
- The EUT is operated in TM 1 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- Open the test software, load the radiated emissions test script, or create a new radiated emissions test script, and configure the test parameters, including the test frequency range, RBW = 100kHz (for below 1GHz) or 1MHz (for above 1GHz), VBW = 300kHz (for below 1GHz) or 3MHz (for above 1GHz), test standard, test antenna, spectrum analyzer, and other related settings.
- The test script was executed, the measurement was performed.
- The turntable rotates 360 degrees, and the test antenna is raised and lowered within a range of 1 to 4 meters.
- Use the spectrum analyzer's Max Hold function to record the maximum test trace. For frequencies below 1 GHz, mark the maximum Quasi-peak value. For frequencies above 1 GHz, mark the maximum Peak and Average values. Save the test data.
- Both vertical and horizontal polarizations of the test antenna need to be tested.

5.10.3 Test Setup

See setup 2 in section 4.4.

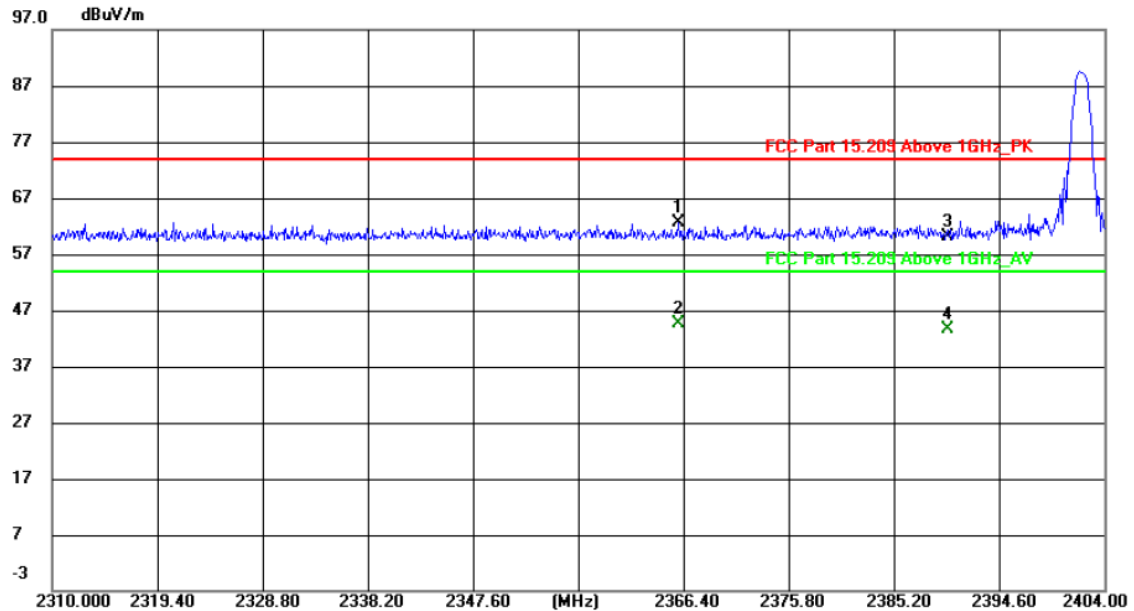
5.10.4 Test Instruments

Refer to section 3.7.

5.10.5 Test Results

Pass.

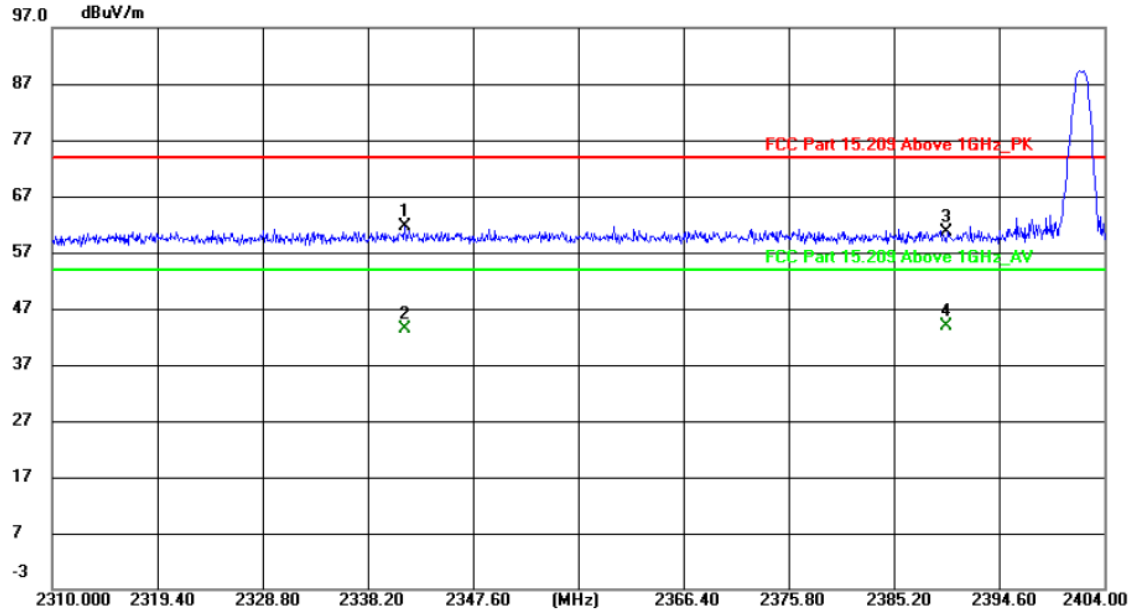
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (1-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2366.001	30.49	32.22	62.71	74.00	-11.29	peak	P
2 *	2366.001	12.32	32.22	44.54	54.00	-9.46	AVG	P
3	2390.000	27.94	32.26	60.20	74.00	-13.80	peak	P
4	2390.000	11.42	32.26	43.68	54.00	-10.32	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

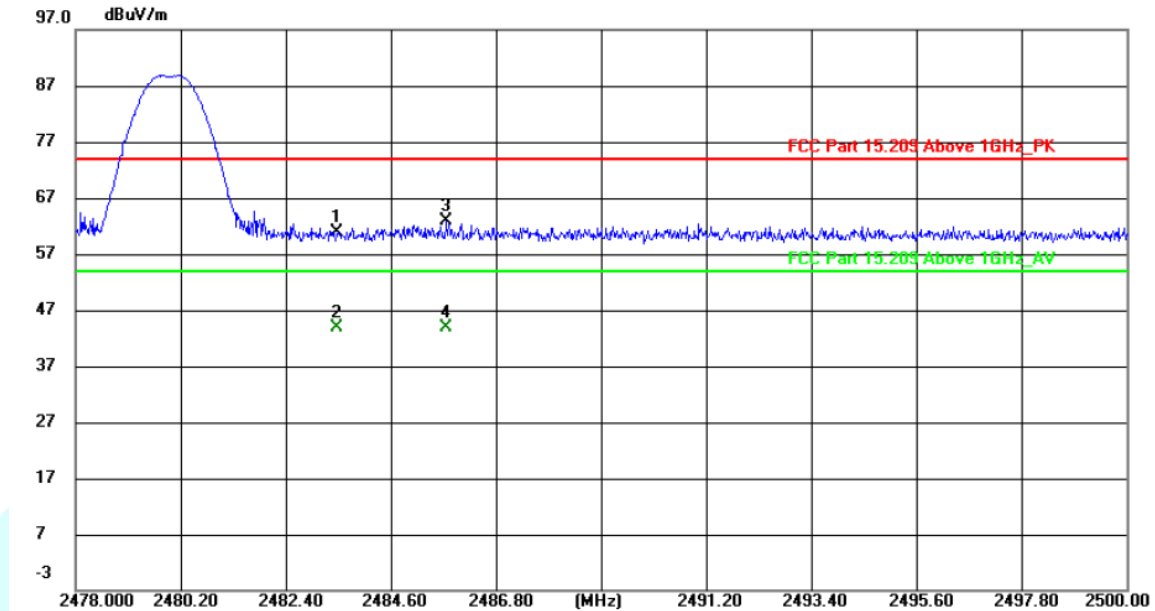
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (1-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2341.502	29.38	32.17	61.55	74.00	-12.45	peak	P
2	2341.502	11.32	32.17	43.49	54.00	-10.51	AVG	P
3	2390.000	28.46	32.26	60.72	74.00	-13.28	peak	P
4 *	2390.000	11.52	32.26	43.78	54.00	-10.22	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

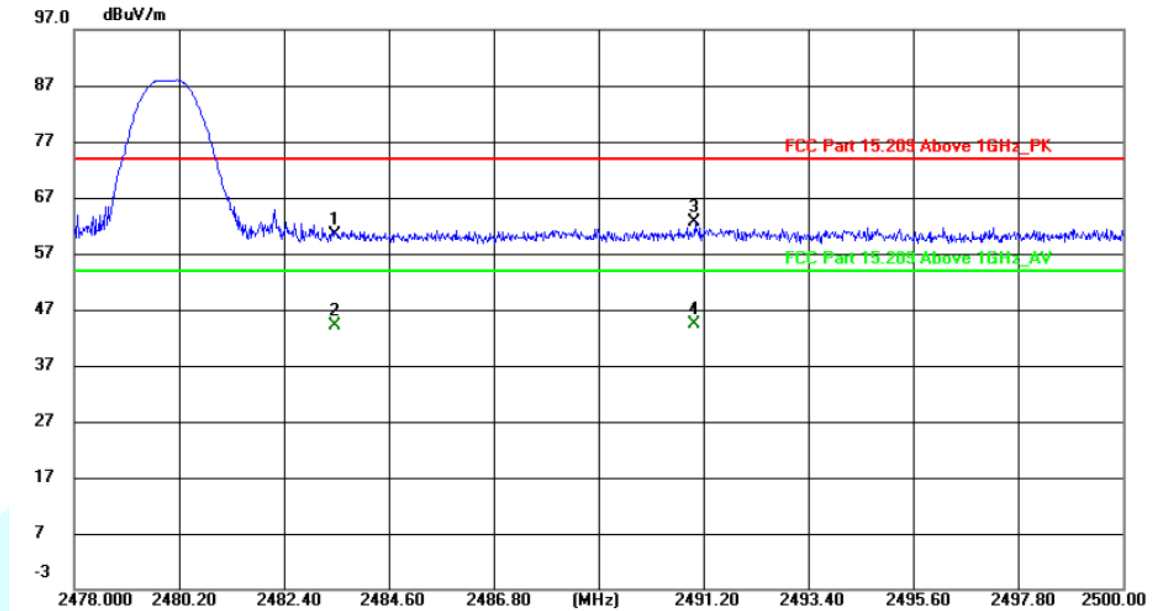
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (1-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	28.34	32.44	60.78	74.00	-13.22	peak	P
2	2483.500	11.36	32.44	43.80	54.00	-10.20	AVG	P
3	2485.774	30.47	32.44	62.91	74.00	-11.09	peak	P
4 *	2485.774	11.42	32.44	43.86	54.00	-10.14	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

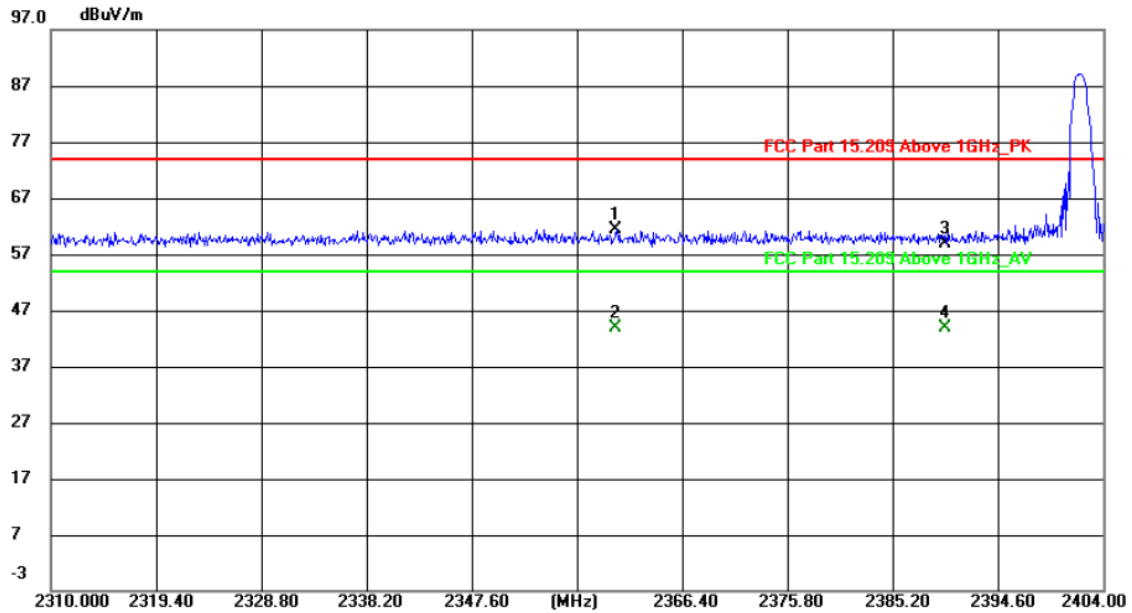
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (1-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	27.97	32.44	60.41	74.00	-13.59	peak	P
2	2483.500	11.65	32.44	44.09	54.00	-9.91	AVG	P
3	2491.032	30.07	32.45	62.52	74.00	-11.48	peak	P
4 *	2491.032	11.85	32.45	44.30	54.00	-9.70	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

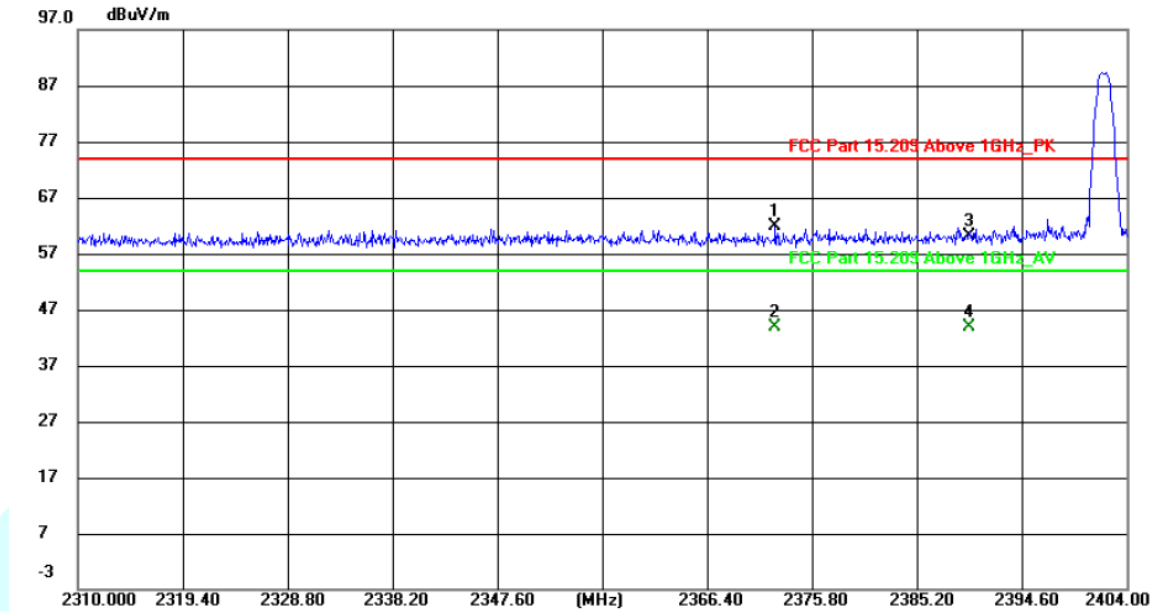
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (2-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2360.654	29.18	32.21	61.39	74.00	-12.61	peak	P
2	2360.654	11.56	32.21	43.77	54.00	-10.23	AVG	P
3	2390.000	26.70	32.26	58.96	74.00	-15.04	peak	P
4 *	2390.000	11.66	32.26	43.92	54.00	-10.08	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

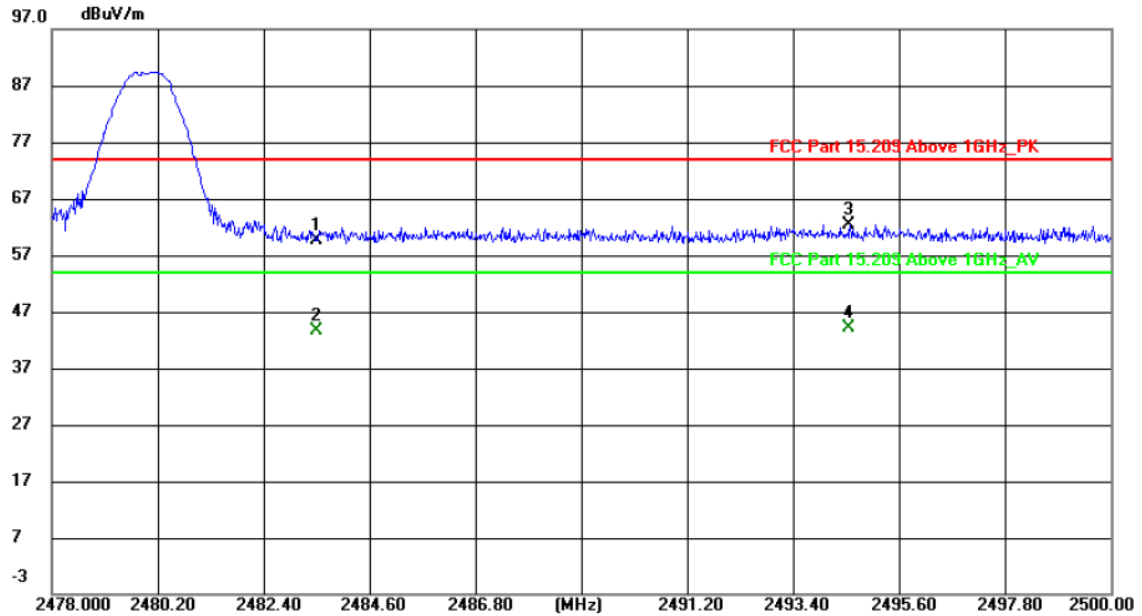
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (2-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2372.557	29.67	32.23	61.90	74.00	-12.10	peak	P
2 *	2372.557	11.63	32.23	43.86	54.00	-10.14	AVG	P
3	2390.000	27.99	32.26	60.25	74.00	-13.75	peak	P
4	2390.000	11.54	32.26	43.80	54.00	-10.20	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

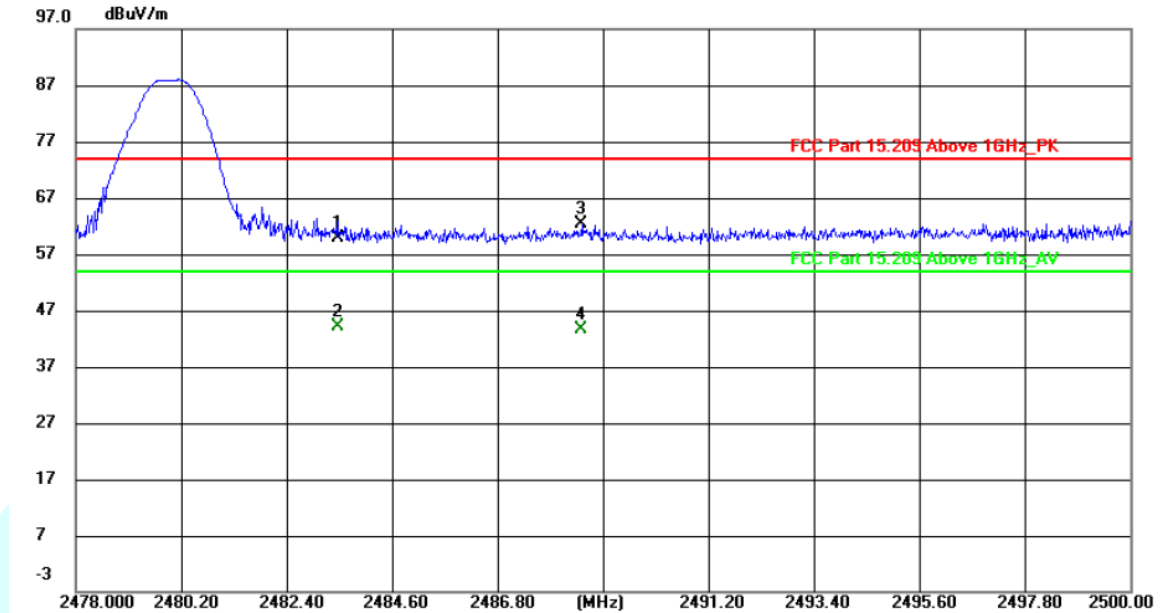
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (2-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	27.16	32.44	59.60	74.00	-14.40	peak	P
2	2483.500	11.25	32.44	43.69	54.00	-10.31	AVG	P
3	2494.596	29.95	32.46	62.41	74.00	-11.59	peak	P
4 *	2494.596	11.63	32.46	44.09	54.00	-9.91	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

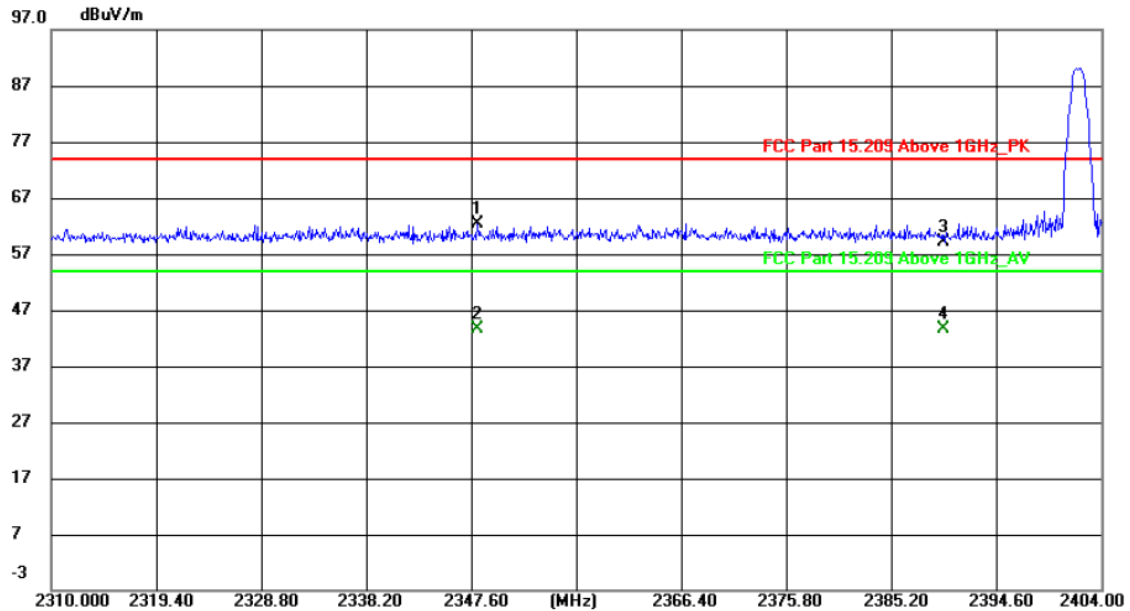
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (2-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	27.53	32.44	59.97	74.00	-14.03	peak	P
2 *	2483.500	11.59	32.44	44.03	54.00	-9.97	AVG	P
3	2488.568	29.94	32.45	62.39	74.00	-11.61	peak	P
4	2488.568	11.21	32.45	43.66	54.00	-10.34	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

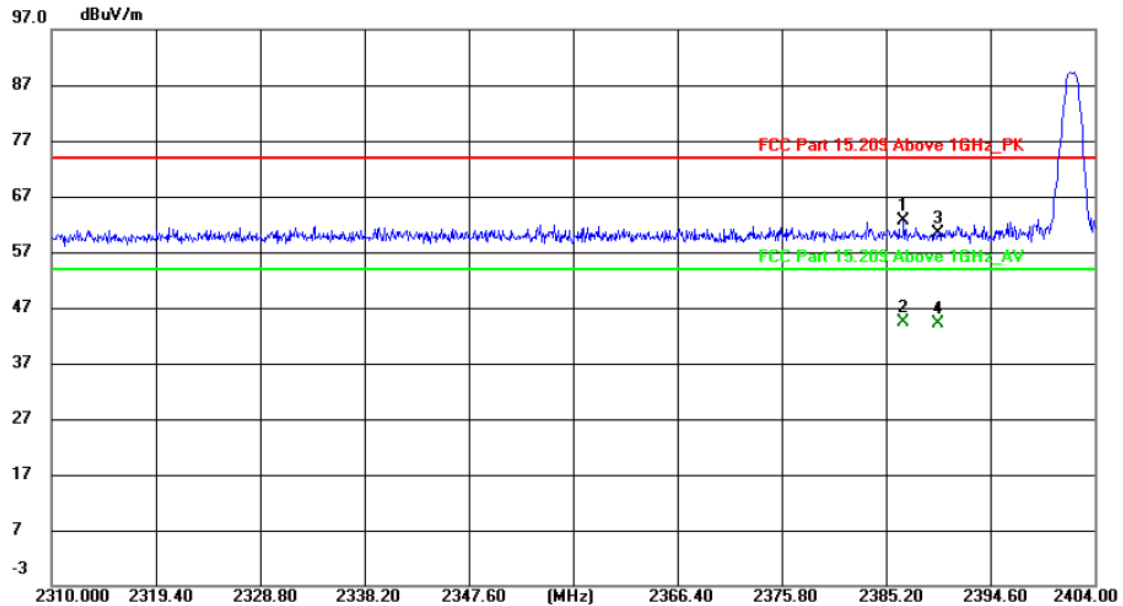
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (3-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2348.211	30.12	32.18	62.30	74.00	-11.70	peak	P
2 *	2348.211	11.56	32.18	43.74	54.00	-10.26	AVG	P
3	2390.000	26.93	32.26	59.19	74.00	-14.81	peak	P
4	2390.000	11.32	32.26	43.58	54.00	-10.42	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

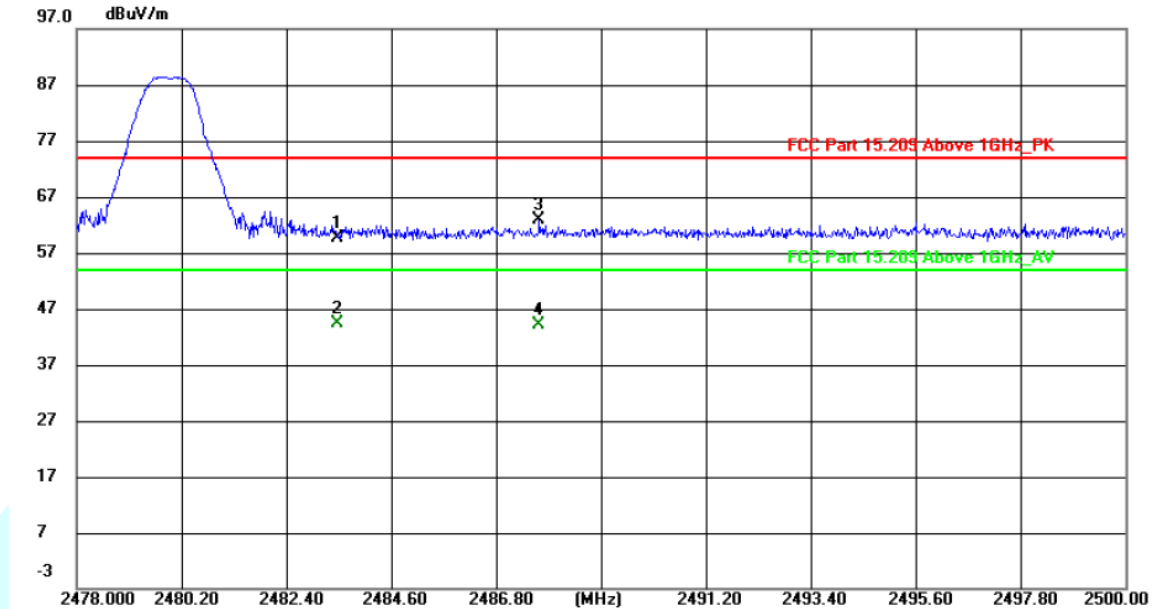
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Lowest channel (3-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2386.822	30.29	32.25	62.54	74.00	-11.46	peak	P
2 *	2386.822	12.06	32.25	44.31	54.00	-9.69	AVG	P
3	2390.000	28.05	32.26	60.31	74.00	-13.69	peak	P
4	2390.000	11.95	32.26	44.21	54.00	-9.79	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

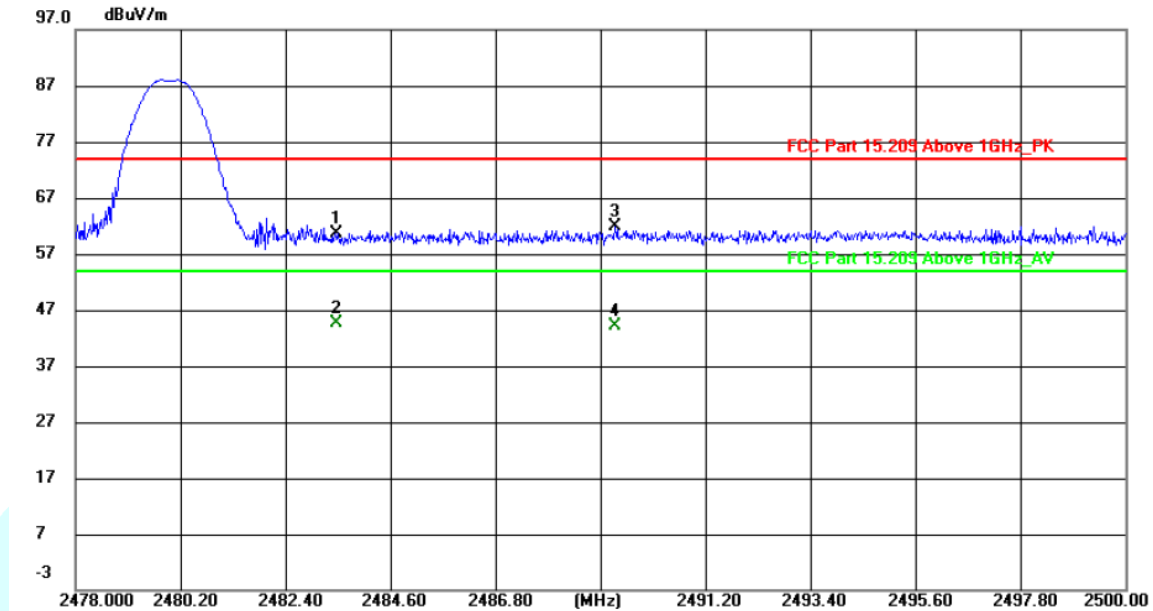
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (3-DH5)	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	27.21	32.44	59.65	74.00	-14.35	peak	P
2 *	2483.500	11.85	32.44	44.29	54.00	-9.71	AVG	P
3	2487.705	30.36	32.45	62.81	74.00	-11.19	peak	P
4	2487.705	11.74	32.45	44.19	54.00	-9.81	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	Highest channel (3-DH5)	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	2483.500	28.12	32.44	60.56	74.00	-13.44	peak	P
2 *	2483.500	12.25	32.44	44.69	54.00	-9.31	AVG	P
3	2489.311	29.46	32.45	61.91	74.00	-12.09	peak	P
4	2489.311	11.65	32.45	44.10	54.00	-9.90	AVG	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

5.11 Emissions in Non-restricted Frequency Bands

5.11.1 Limits

Frequency (MHz)	Limits (dB μ V/m) at 3m	Detector
30 - 88	40.0	Quasi-peak
88 - 216	43.5	Quasi-peak
216 - 960	46.0	Quasi-peak
960 - 1000	54.0	Quasi-peak
Note: The more stringent limits applies at transition frequencies.		
Frequency (MHz)	Limits (dB μ V/m) at 3m	
	Average	Peake
Above 1GHz	54.0	74.

5.11.2 Test Procedure

- The EUT is placed on a non-conducting table of the 3m SAC turntable, 80 cm above the ground plane for measurement below 1GHz, 1.5 m above the ground plane for measurement above 1GHz. The measurement receiving antenna to EUT distance is 3 meters. The EUT was arranged in accordance with ANSI C63.10.
- The EUT is operated in TM 1 mode as described in Section 4.2. The EUT test channel and modulation type settings are described in Section 4.3.
- Open the test software, load the radiated emissions test script, or create a new radiated emissions test script, and configure the test parameters, including the test frequency range, RBW = 100kHz (for below 1GHz) or 1MHz (for above 1GHz), VBW = 300kHz (for below 1GHz) or 3MHz (for above 1GHz), test standard, test antenna, spectrum analyzer, and other related settings.
- The test script was executed, the measurement was performed.
- The turntable rotates 360 degrees, and the test antenna is raised and lowered within a range of 1 to 4 meters.
- Use the spectrum analyzer's Max Hold function to record the maximum test trace. For frequencies below 1 GHz, mark the maximum Quasi-peak value. For frequencies above 1 GHz, mark the maximum Peak and Average values. Save the test data.
- Both vertical and horizontal polarizations of the test antenna need to be tested.

5.11.3 Test Setup

See setup 2 in section 4.4.

5.11.4 Test Instruments

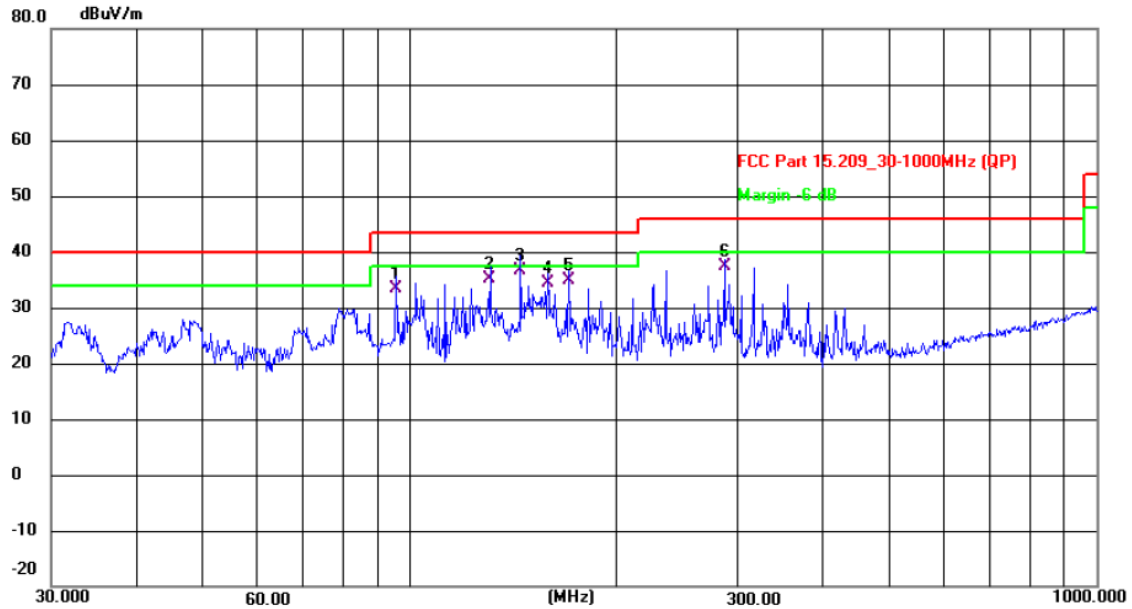
Refer to section 3.7.

5.11.5 Test Results

Pass.

1) Test Frequency Range: Below 1GHz

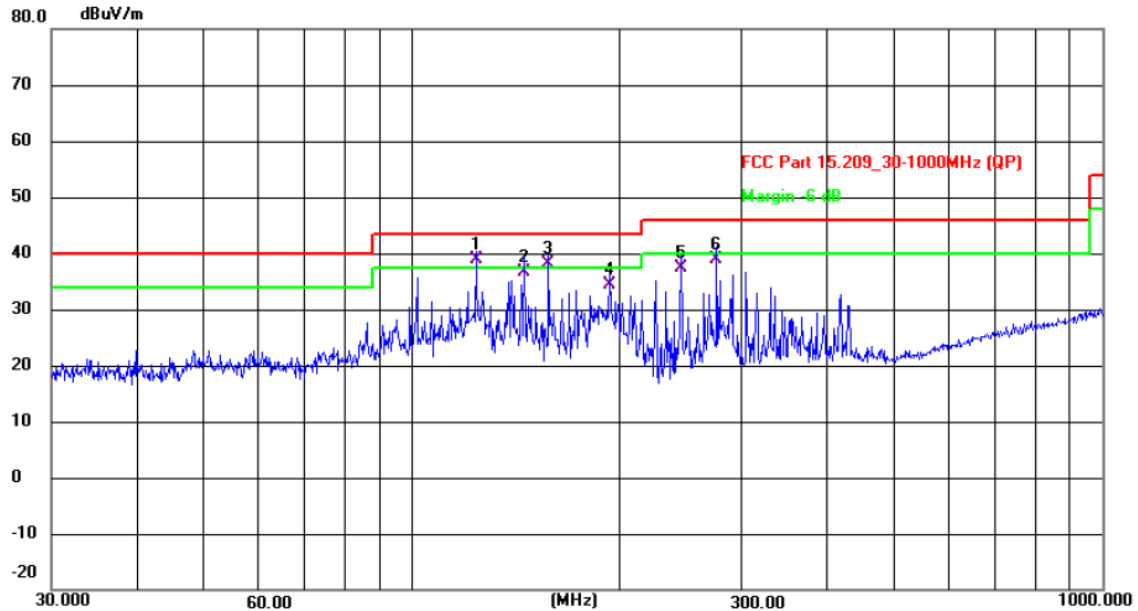
Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	30MHz ~ 1GHz	Polarization:	Vertical
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	95.4270	67.42	-33.92	33.50	43.50	-10.00	QP	P
2	130.8369	68.72	-33.68	35.04	43.50	-8.46	QP	P
3 *	144.8417	70.33	-33.58	36.75	43.50	-6.75	QP	P
4	158.6675	67.85	-33.47	34.38	43.50	-9.12	QP	P
5	170.1947	68.36	-33.38	34.98	43.50	-8.52	QP	P
6	286.9823	69.85	-32.58	37.27	46.00	-8.73	QP	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

Product Name:	Portable Wireless Speaker	Model No.:	MS02
Test By:	Albers Liu	Test mode:	TM 1
Test Channel:	30MHz ~ 1GHz	Polarization:	Horizontal
Test Voltage:	DC 11.10V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1 *	123.6984	72.54	-33.73	38.81	43.50	-4.69	QP	P
2	145.3505	70.21	-33.56	36.65	43.50	-6.85	QP	P
3 !	157.5586	71.53	-33.47	38.06	43.50	-5.44	QP	P
4	193.0944	67.60	-33.22	34.38	43.50	-9.12	QP	P
5	245.0900	70.25	-32.89	37.36	46.00	-8.64	QP	P
6	276.1234	71.67	-32.67	39.00	46.00	-7.00	QP	P

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

2) Test Frequency Range: Above 1GHz

Modulation Type: 1-DH5							
Test channel: Lowest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4804.00	64.52	-8.52	56.00	74.00	18.00	Peak	Vertical
	46.36	-8.52	37.84	54.00	16.16	Average	
	64.85	-8.52	56.33	74.00	17.67	Peak	Horizontal
	46.23	-8.52	37.71	54.00	16.29	Average	
Test channel: Middle channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4882.00	64.52	-8.05	56.47	74.00	17.53	Peak	Vertical
	45.63	-8.05	37.58	54.00	16.42	Average	
	63.48	-8.05	55.43	74.00	18.57	Peak	Horizontal
	45.32	-8.05	37.27	54.00	16.73	Average	
Test channel: Highest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4960.00	64.52	-8.29	56.23	74.00	17.77	Peak	Vertical
	45.36	-8.29	37.07	54.00	16.93	Average	
	64.52	-8.29	56.23	74.00	17.77	Peak	Horizontal
	45.80	-8.29	37.51	54.00	16.49	Average	

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

Modulation Type: 2-DH5							
Test channel: Lowest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4804.00	64.58	-8.52	56.06	74.00	17.94	Peak	Vertical
	46.52	-8.52	38.00	54.00	16.00	Average	
	63.54	-8.52	55.02	74.00	18.98	Peak	Horizontal
	45.65	-8.52	37.13	54.00	16.87	Average	
Test channel: Middle channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4882.00	63.65	-8.05	55.60	74.00	18.40	Peak	Vertical
	45.58	-8.05	37.53	54.00	16.47	Average	
	63.41	-8.05	55.36	74.00	18.64	Peak	Horizontal
	45.37	-8.05	37.32	54.00	16.68	Average	
Test channel: Highest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4960.00	64.52	-8.29	56.23	74.00	17.77	Peak	Vertical
	45.69	-8.29	37.40	54.00	16.60	Average	
	63.74	-8.29	55.45	74.00	18.55	Peak	Horizontal
	44.85	-8.29	36.56	54.00	17.44	Average	

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

Modulation Type: 3-DH5							
Test channel: Lowest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4804.00	63.87	-8.52	55.35	74.00	18.65	Peak	Vertical
	45.60	-8.52	37.08	54.00	16.92	Average	
	63.74	-8.52	55.22	74.00	18.78	Peak	Horizontal
	44.88	-8.52	36.36	54.00	17.64	Average	
Test channel: Middle channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4882.00	63.85	-8.05	55.80	74.00	18.20	Peak	Vertical
	45.52	-8.05	37.47	54.00	16.53	Average	
	63.44	-8.05	55.39	74.00	18.61	Peak	Horizontal
	44.56	-8.05	36.51	54.00	17.49	Average	
Test channel: Highest channel							
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Polarization
4960.00	63.85	-8.29	55.56	74.00	18.44	Peak	Vertical
	44.84	-8.29	36.55	54.00	17.45	Average	
	63.15	-8.29	54.86	74.00	19.14	Peak	Horizontal
	44.36	-8.29	36.07	54.00	17.93	Average	

Remark: Level = Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).

----- End of Report -----