

Test Report

FCC Part15 Subpart C

Product Name : BLUETOOTH SPEAKER
Model No. : LTG200
FCC ID : Y2SLTG200
IC : 9452A-LTG200

Applicant : LIBRATONE A/S
Address : Sundkaj 9, DK-2150 Nordhavn, Denmark

Date of Receipt : Apr. 04, 2016
Test Date : Apr. 04, 2016~ Apr. 04, 2016
Issued Date : Apr. 28, 2016
Report No. : 1632020R-RF-US-P06V02
Report Version : V2.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of Quietek Corporation.

Test Report Certification

Issued Date : Apr. 28, 2016
Report No. : 1632020R-RF-US-P06V02



Product Name : BLUETOOTH SPEAKER
Applicant : LIBRATONE A/S
Address : Sundkaj 9, DK-2150 Nordhavn, Denmark
Manufacturer : LIBRATONE A/S
Address : Sundkaj 9, DK-2150 Nordhavn, Denmark
Model No. : LTG200
FCC ID : Y2SLTG200
IC : 9452A-LTG200
Brand Name : LIBRATONE
EUT Voltage : DC 5V
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2015
ANSI C63.4:2014; ANSI C63.10:2013;
KDB 558074 D01v03r04
Industry Canada RSS-Gen Issue 4 / RSS-247 Issue 1
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392; IC Lab Code: 4075B

Documented By : Alice Ni
(Senior Adm. Specialist: Alice Ni)

Reviewed By : Frank He
(Senior Engineer: Frank He)

Approved By : Harry Zhao
(Engineering Manager : Harry Zhao)

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/english/about/certificates.aspx?bval=5>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

Description	Page
1. General Information	7
1.1. EUT Description	7
1.2. Working Frequency of Each Channel:.....	7
1.3. Antenna information	8
1.4. Mode of Operation.....	8
1.5. Tested System Details.....	8
1.6. Configuration of Tested System.....	9
1.7. EUT Exercise Software	11
2. Technical Test	12
2.1. Summary of Test Result	12
2.2. Test Frequency configuration:.....	14
2.3. Test Environment.....	15
2.4. Measurement Uncertainty	15
3. AC Power Line Conducted Emission.....	16
3.1. Test Equipment.....	16
3.2. Test Setup.....	16
3.3. Limit	17
3.4. Test Procedure	17
3.5. Test Result.....	18
4. Emissions in restricted frequency bands	22
4.1. Test Equipment.....	22
4.2. Test Setup.....	23
4.3. Limit	24
4.4. Test Procedure	26
4.5. EUT test Axis definition	27
4.6. Test Result.....	28
5. Emissions in non-restricted frequency bands	31
5.1. Test Equipment.....	31
5.2. Test Setup.....	32
5.3. Limit	33
5.4. Test Procedure	34
5.5. EUT test Axis definition	35
5.6. Test Result.....	36
6. Radiated Emission Band Edge.....	37
6.1. Test Equipment.....	37
6.2. Test Setup.....	38
6.3. Limit	38

6.4.	Test Procedure	39
6.5.	EUT test definition	40
6.6.	Duty Cycle	41
6.7.	Test Result	42
7.	Occupied Bandwidth	50
7.1.	Test Equipment.....	50
7.2.	Test Setup.....	50
7.3.	Limit	51
7.4.	Test Procedure	51
7.5.	EUT test definition	52
7.6.	Test Result.....	53
8.	Fundamental emission output power.....	54
8.1.	Test Equipment.....	54
8.2.	Test Setup.....	54
8.3.	Limit	55
8.4.	Test Procedure	56
8.5.	EUT test definition	57
8.6.	Test Result.....	58
9.	Power Spectral Density.....	59
9.1.	Test Equipment.....	59
9.2.	Test Setup.....	59
9.3.	Limit	59
9.4.	Test Procedure	60
9.5.	EUT test definition	61
9.6.	Test Result.....	62

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1632020R-RF-US-P06V01	V1.0	Initial Issued Report	Apr. 19, 2016
1632020R-RF-US-P06V01	V2.0	Change the address of the applicant and manufacturer	Apr. 28, 2016

1. General Information

1.1. EUT Description

Product Name	BLUETOOTH SPEAKER
Brand Name	LIBRATONE
Model No.	LTG200
Working Voltage	DC 5V
Bluetooth Specification	V3.0+V4.0
Frequency Range	2402- 2480 MHz
Channel Number	V3.0: 79 V4.0: 40
Channel Separation	V3.0: 1MHz V4.0: 2MHz
Type of Modulation	V3.0: GFSK, Pi/4 DQPSK, 8DPSK V4.0: GFSK
Data Rate	V3.0: 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK) V4.0: 1Mbps(GFSK)
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

1.2. Working Frequency of Each Channel:

Bluetooth Working Frequency of Each Channel: (For V4.0)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

1.3. Antenna information

Model No.	N/A					
Antenna manufacturer	N/A					
Antenna Delivery	<input checked="" type="checkbox"/>	1*TX+1*RX	<input type="checkbox"/>	2*TX+2*RX	<input type="checkbox"/>	3*TX+3*RX
Antenna technology	<input checked="" type="checkbox"/>	SISO				
	<input type="checkbox"/>	MIMO	<input type="checkbox"/>	Basic		
			<input type="checkbox"/>	CDD		
			<input type="checkbox"/>	Beam-forming		
Antenna Type	<input type="checkbox"/>	External	<input type="checkbox"/>	Dipole		
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/>	PIFA		
			<input type="checkbox"/>	PCB		
			<input type="checkbox"/>	Ceramic Chip Antenna		
			<input checked="" type="checkbox"/>	Metal plate type F antenna		
Antenna Gain	0dBi					

1.4. Mode of Operation

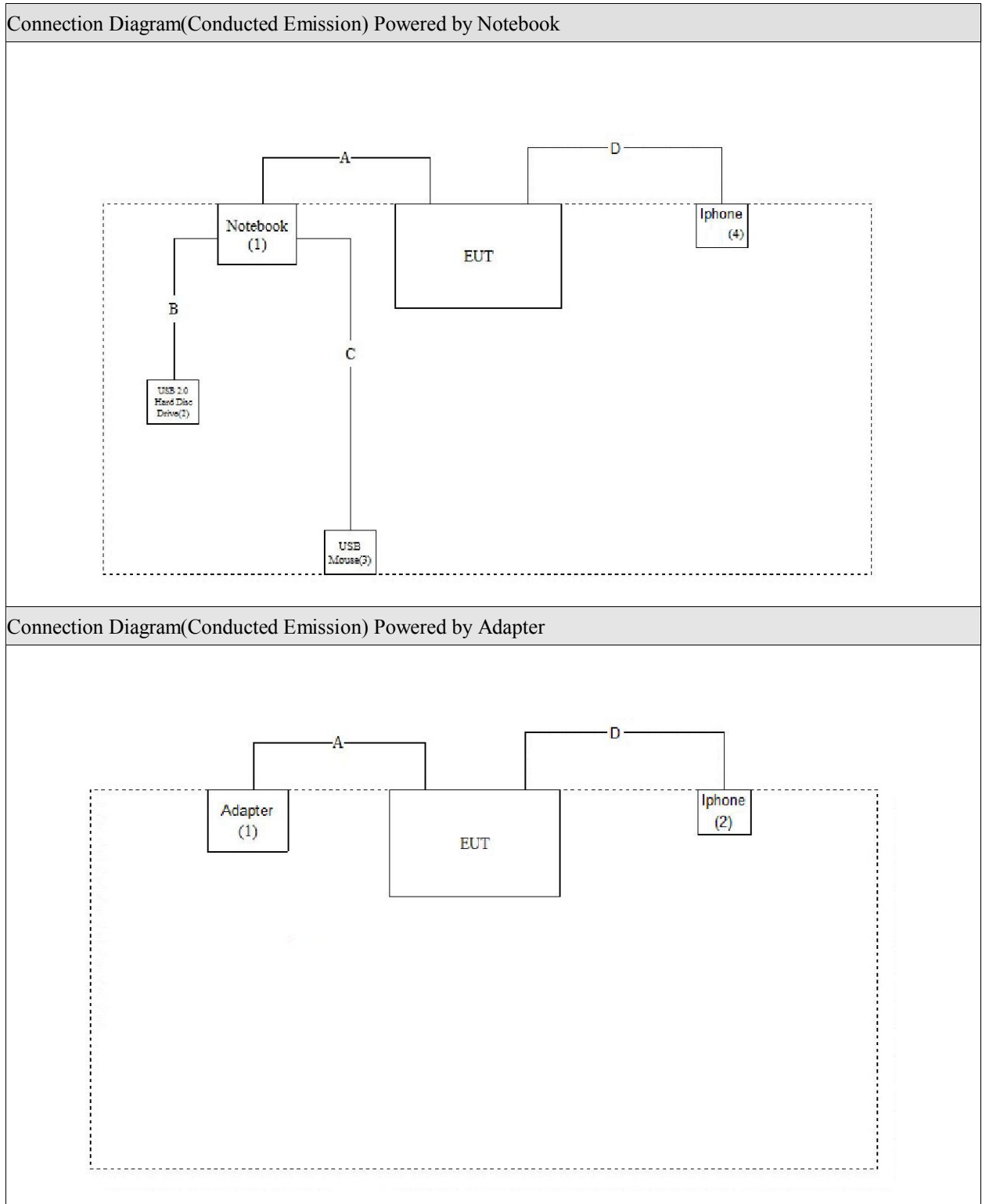
Test Mode
Mode 1: Transmit-1Mbps(GFSK_BLE)

1.5. Tested System Details

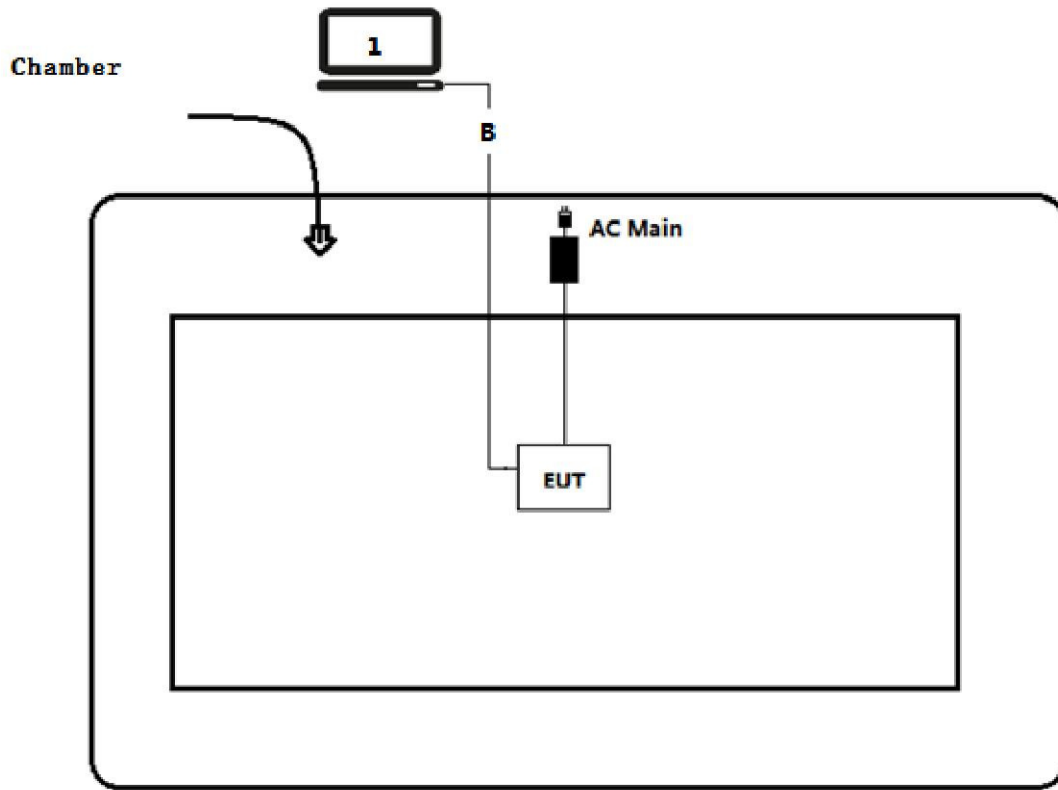
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

No.	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Think Pad	2526	LV-A3285	Power by adapter

1.6. Configuration of Tested System



Test setup Diagram- Radiated Emission



Signal Cable Type		Signal cable Description
A	Mini USB Cable	Shielded, 1.0m
B	USB 2.0 Cable	Shielded, 0.5m
C	USB Mouse Cable	Shielded, 1.8m
D	Audio Cable	Shielded, 0.5m

1.7. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Run the RF test software, and set the test mode and channel, then press OK to start continue receive.

2. Technical Test

2.1. Summary of Test Result

Performed Test Item	Normative References	Worst case mode	Limit	Result
AC Power Line Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207	Mode 1	FCC 15.207	PASS
Emissions in restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209	Mode 1	FCC 15.209	PASS
Emissions in non-restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(d)	Mode 1	$\geq 20\text{dBc}$	PASS
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2015 15.247(d)	Mode 1	FCC 15.209	PASS
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(a)(2)	Mode 1	$\geq 500\text{kHz}$	PASS
Fundamental emission output power	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(b)(3)	Mode 1	$\leq 30\text{dBm}$	PASS
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(e)	Mode 1	$\leq 8\text{dBm}/3\text{kHz}$	PASS

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 4 Section 8.8	Yes	No
Radiated Emission	RSS-Gen Issue 4 Section 8.9	Yes	No
RF Antenna Conducted Spurious	RSS-247 Issue 1 Section A5.5	Yes	No
Radiated Emission Band Edge	RSS-210 Issue 1 Section A5.5	Yes	No
Occupied Bandwidth	RSS-Gen Issue 4 Section 6.6 RSS-247 Issue 1 Section A5.2(1)	Yes	No
Power Output	RSS-247 Issue 1 Section A5.4(4)	Yes	No
Power Spectral Density	RSS-247 Issue 1 Section A5.2(2)	Yes	No

2.2. Test Frequency configuration:

Modulation Mode	Channel	Frequency	Channel	Frequency	Channel	Frequency
BLE	00	2402 MHz	19	2440 MHz	39	2480MHz

2.3. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

2.4. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	$\pm 2.02\text{dB}$
Radiated Emission	Below 1GHz $\pm 3.8\text{ dB}$
	Above 1GHz $\pm 3.9\text{ dB}$
RF Antenna Port Conducted Emission	$\pm 1.27\text{dB}$
Radiated Emission Band Edge	$\pm 3.9\text{dB}$
Occupied Bandwidth	$\pm 1\text{kHz}$
Power Spectral Density	$\pm 1.27\text{dB}$

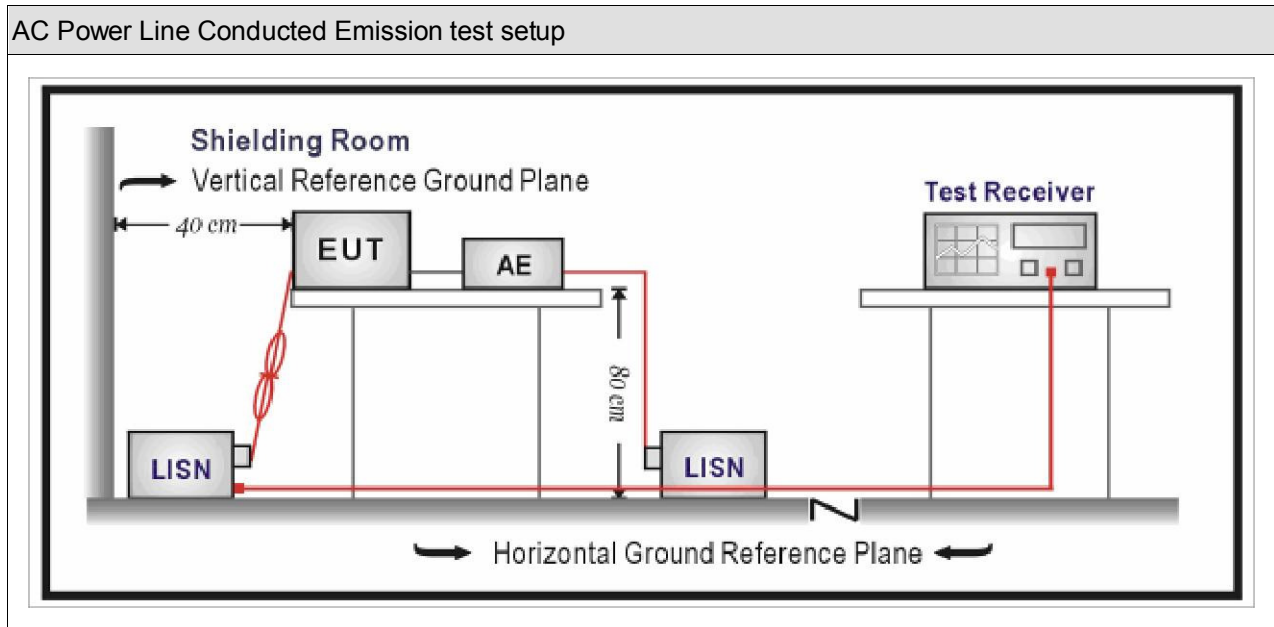
3. AC Power Line Conducted Emission

3.1. Test Equipment

AC Power Line Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.05	2017.03.04
Two-Line V-Network	R&S	ENV216	100043	2015.03.29	2017.03.28
Two-Line V-Network	R&S	ENV216	100044	2015.09.17	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.02	2017.03.01
50ohm Termination	SHX	TF2	07081401	2015.09.17	2016.09.16
Temperature/Humidity Meter	zhichen	ZC1-2	TR1-TH	2016.01.04	2017.01.03

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

Frequency of Emission (MHz)	Conducted Limit	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

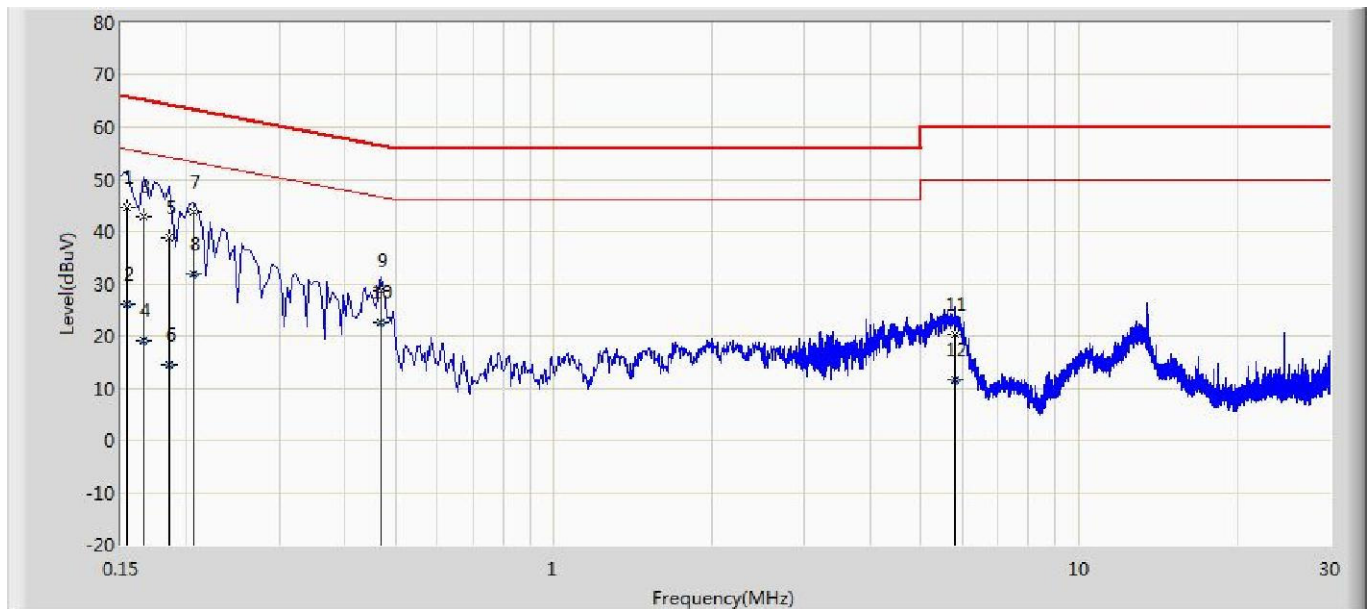
Note 1: The lower limit shall apply at the transition frequencies.
 Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

Test Method			
	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
<input checked="" type="checkbox"/>	ANSI C63.4-2014	7	AC power-line conducted emission measurements

3.5. Test Result

Site: TR1	Time: 2016/04/11
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Mode1 Powered by Notebook	

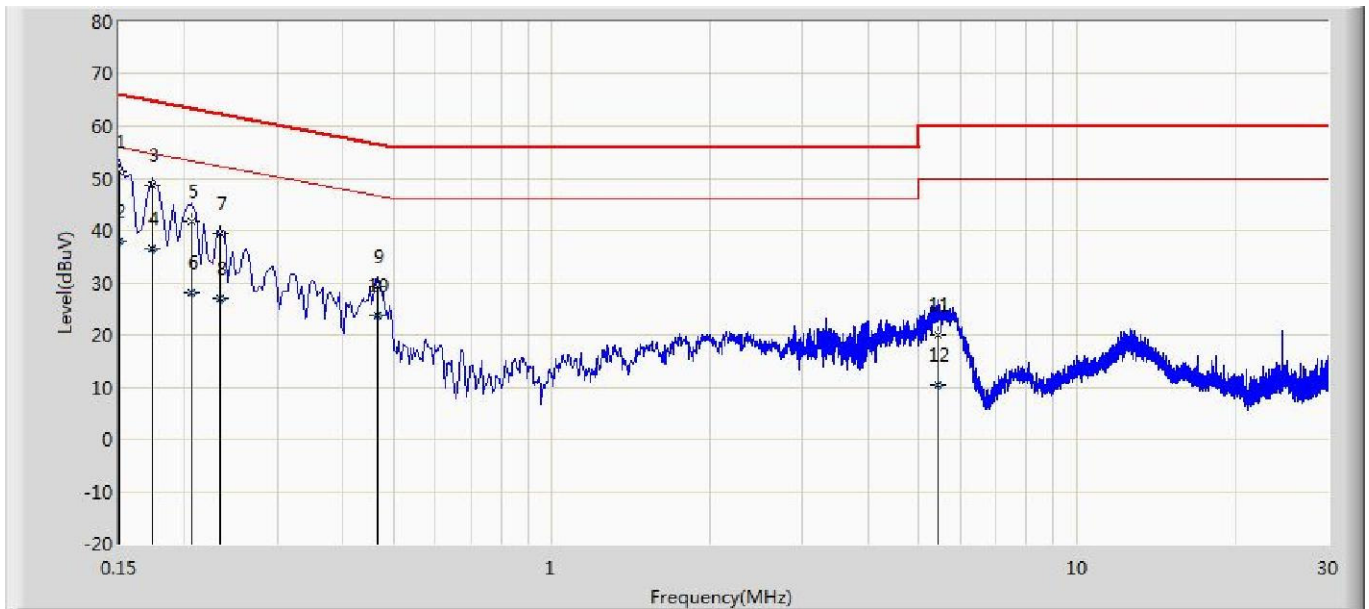


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.154	44.745	35.012	-21.036	65.781	9.673	0.060	0.000	QP
2		0.154	26.230	16.497	-29.551	55.781	9.673	0.060	0.000	AV
3		0.166	42.832	33.107	-22.326	65.158	9.665	0.060	0.000	QP
4		0.166	19.148	9.423	-36.010	55.158	9.665	0.060	0.000	AV
5		0.186	38.898	29.186	-25.315	64.213	9.652	0.060	0.000	QP
6		0.186	14.367	4.655	-39.846	54.213	9.652	0.060	0.000	AV
7	*	0.206	43.742	34.032	-19.623	63.365	9.650	0.060	0.000	QP
8		0.206	31.996	22.286	-21.369	53.365	9.650	0.060	0.000	AV
9		0.470	28.575	18.875	-27.939	56.514	9.630	0.070	0.000	QP
10		0.470	22.705	13.005	-23.809	46.514	9.630	0.070	0.000	AV
11		5.818	20.201	10.341	-39.799	60.000	9.680	0.180	0.000	QP
12		5.818	11.710	1.850	-38.290	50.000	9.680	0.180	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: TR1	Time: 2016/04/11
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Model Powered by Notebook	

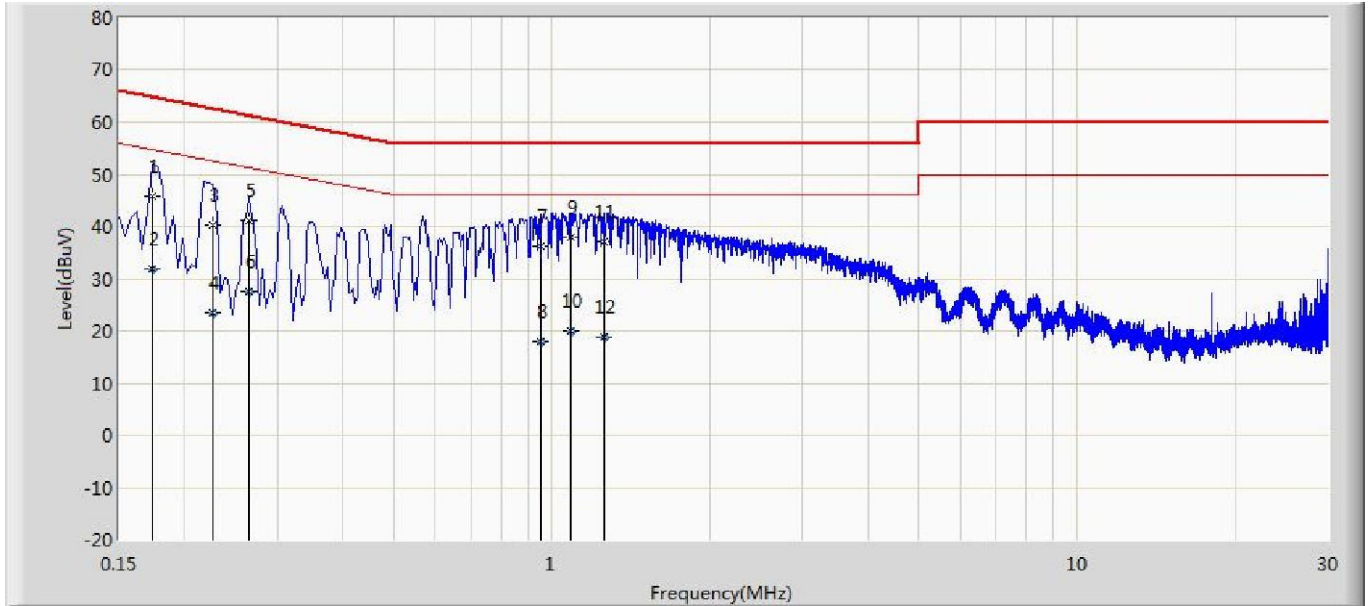


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1	*	0.150	51.186	41.450	-14.814	66.000	9.676	0.060	0.000	QP
2		0.150	37.832	28.096	-18.168	56.000	9.676	0.060	0.000	AV
3		0.174	48.755	39.030	-16.012	64.767	9.665	0.060	0.000	QP
4		0.174	36.450	26.725	-18.317	54.767	9.665	0.060	0.000	AV
5		0.206	41.784	32.064	-21.581	63.365	9.660	0.060	0.000	QP
6		0.206	28.001	18.281	-25.364	53.365	9.660	0.060	0.000	AV
7		0.234	39.291	29.571	-23.016	62.307	9.660	0.060	0.000	QP
8		0.234	27.066	17.346	-25.241	52.307	9.660	0.060	0.000	AV
9		0.466	29.385	19.685	-27.200	56.585	9.630	0.070	0.000	QP
10		0.466	23.634	13.934	-22.951	46.585	9.630	0.070	0.000	AV
11		5.438	19.882	10.042	-40.118	60.000	9.670	0.170	0.000	QP
12		5.438	10.333	0.493	-39.667	50.000	9.670	0.170	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
 2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).
- All the low ,middle and high channels of all different modes are investigated, and only report the worst case.

Site: TR1	Time: 2016/04/11
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Model Powered by Adapter	

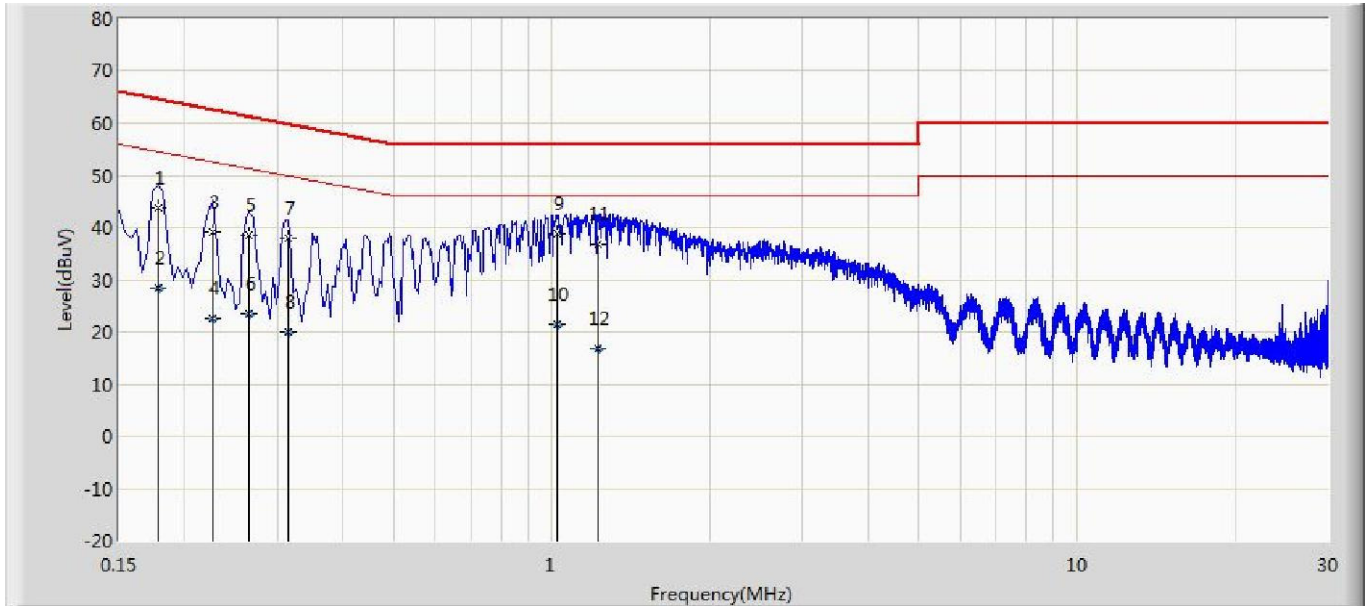


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.174	45.659	35.939	-19.108	64.767	9.660	0.060	0.000	QP
2		0.174	31.912	22.192	-22.855	54.767	9.660	0.060	0.000	AV
3		0.226	40.288	30.578	-22.307	62.595	9.650	0.060	0.000	QP
4		0.226	23.386	13.676	-29.209	52.595	9.650	0.060	0.000	AV
5		0.266	41.183	31.479	-20.059	61.242	9.644	0.060	0.000	QP
6		0.266	27.416	17.712	-23.826	51.242	9.644	0.060	0.000	AV
7		0.954	36.255	26.545	-19.745	56.000	9.630	0.080	0.000	QP
8		0.954	17.987	8.277	-28.013	46.000	9.630	0.080	0.000	AV
9	*	1.086	38.031	28.321	-17.969	56.000	9.630	0.080	0.000	QP
10		1.086	19.956	10.246	-26.044	46.000	9.630	0.080	0.000	AV
11		1.258	36.961	27.251	-19.039	56.000	9.630	0.080	0.000	QP
12		1.258	18.956	9.246	-27.044	46.000	9.630	0.080	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: TR1	Time: 2016/04/11
Limit: FCC_Part15.107_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Model Powered by Adapter	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		0.178	43.793	34.069	-20.785	64.578	9.664	0.060	0.000	QP
2		0.178	28.441	18.717	-26.137	54.578	9.664	0.060	0.000	AV
3		0.226	39.189	29.469	-23.406	62.595	9.660	0.060	0.000	QP
4		0.226	22.468	12.748	-30.127	52.595	9.660	0.060	0.000	AV
5		0.266	38.593	28.879	-22.649	61.242	9.654	0.060	0.000	QP
6		0.266	23.506	13.792	-27.736	51.242	9.654	0.060	0.000	AV
7		0.314	38.081	28.371	-21.783	59.864	9.650	0.060	0.000	QP
8		0.314	19.992	10.282	-29.872	49.864	9.650	0.060	0.000	AV
9	*	1.026	38.897	29.187	-17.103	56.000	9.630	0.080	0.000	QP
10		1.026	21.508	11.798	-24.492	46.000	9.630	0.080	0.000	AV
11		1.226	36.750	27.040	-19.250	56.000	9.630	0.080	0.000	QP
12		1.226	16.751	7.041	-29.249	46.000	9.630	0.080	0.000	AV

Note:

1. " * ", means this data is the worst emission level.
 2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).
- All the low ,middle and high channels of all different modes are investigated, and only report the worst case.

4. Emissions in restricted frequency bands

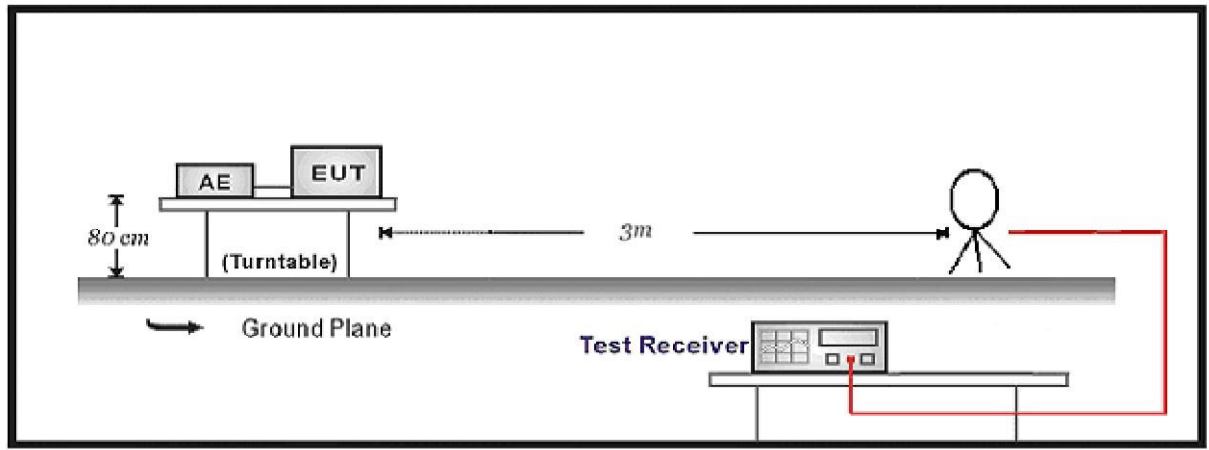
4.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.05	2017.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.16	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.02	2017.03.01
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

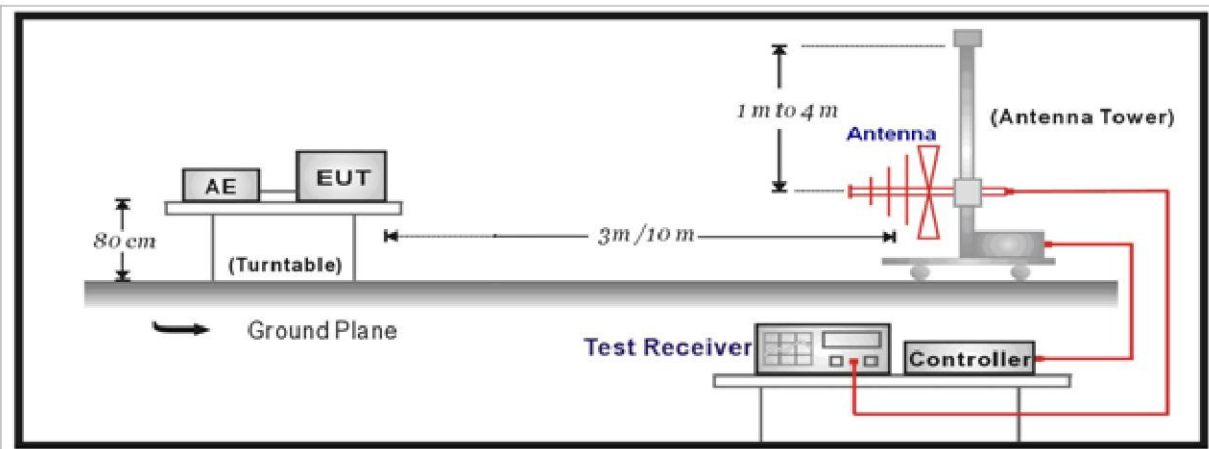
Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

4.2. Test Setup

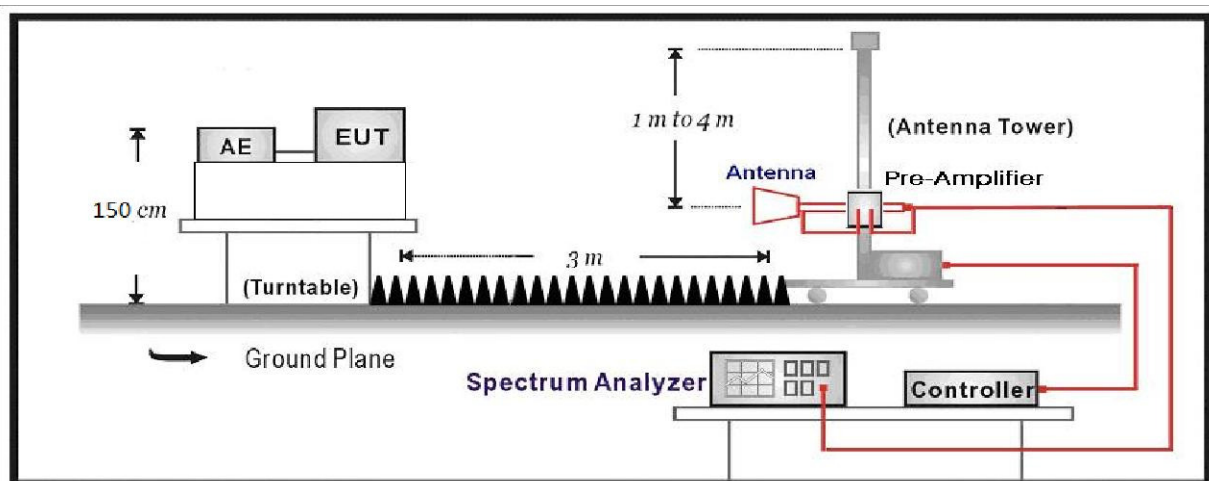
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

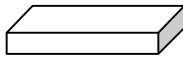
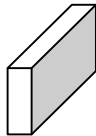
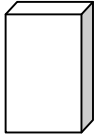
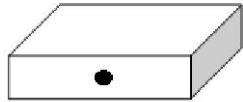

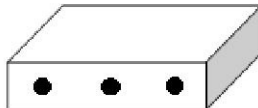
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
	<input checked="" type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
<input checked="" type="checkbox"/>	ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

4.5. EUT test Axis definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input checked="" type="checkbox"/>	Fixed position use		
	<input type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input checked="" type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

4.6. Test Result

Product Name	: BLUETOOTH SPEAKER	Power	: DC 3.3V
Test Mode	: Mode 1	Test Site	: AC-5

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dB μ V/m)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
Ant 0	1	H	4824.0	43.1	7.3	50.4	54(note3)	3.6	PK
		H	7230.5	33.8	12.7	46.5	54(note3)	7.5	PK
		H	9644.5	30.1	14.9	45.0	54(note3)	9.0	PK
		V	4823.9	43.5	7.3	50.8	54(note3)	3.2	PK
		V	7230.5	33.7	12.7	46.4	54(note3)	7.6	PK
		V	9644.5	33.1	14.9	48.0	54(note3)	6.0	PK
	6	H	4876.0	41.5	7.4	48.9	54(note3)	5.1	PK
		H	7311.0	28.6	12.5	41.1	54(note3)	12.9	PK
		H	9748.0	26.5	14.8	41.3	54(note3)	12.7	PK
		V	4876.0	41.0	7.4	48.4	54(note3)	5.6	PK
		V	7311.0	28.6	12.5	41.1	54(note3)	12.9	PK
		V	9748.0	29.7	14.8	44.5	54(note3)	9.5	PK
	11	H	4927.0	41.3	7.5	48.8	54(note3)	5.2	PK
		H	7386.0	25.5	12.3	37.8	54(note3)	16.2	PK
		H	9848.0	22.6	15.3	37.9	54(note3)	16.1	PK
		V	4927.0	39.3	7.5	46.8	54(note3)	7.2	PK
		V	7386.0	23.8	12.3	36.1	54(note3)	17.9	PK
		V	9848.0	21.4	15.3	36.7	54(note3)	17.3	PK

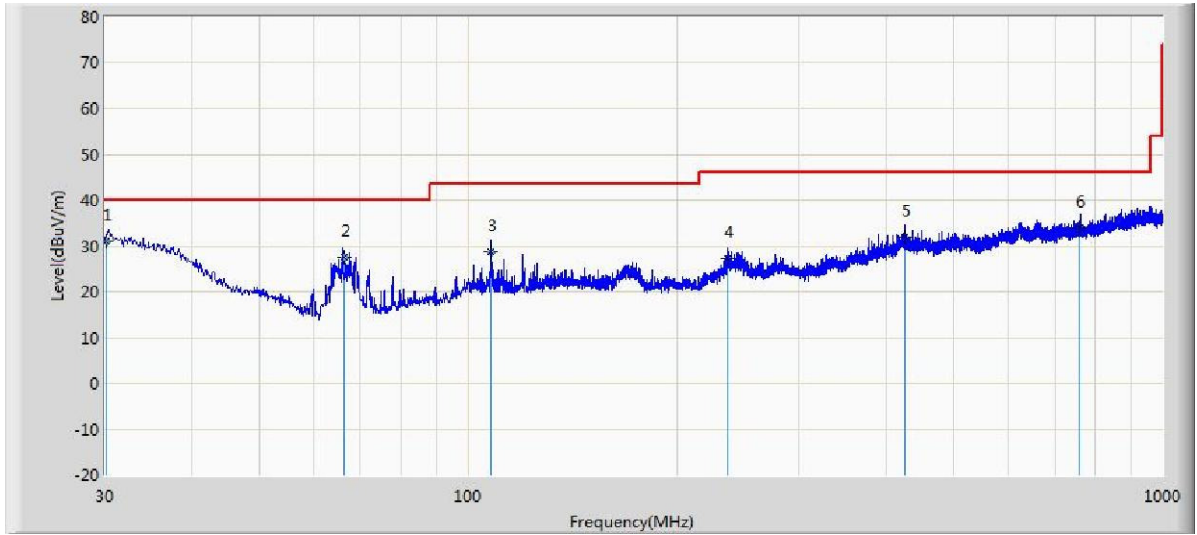
Note: 1. Measure Level = Reading Level + Factor.
 Note: 2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.
 Note: 3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
 Note: 4. The RBW set up , see Clause 6.6..

The worst case of Radiated Emission below 1GHz:

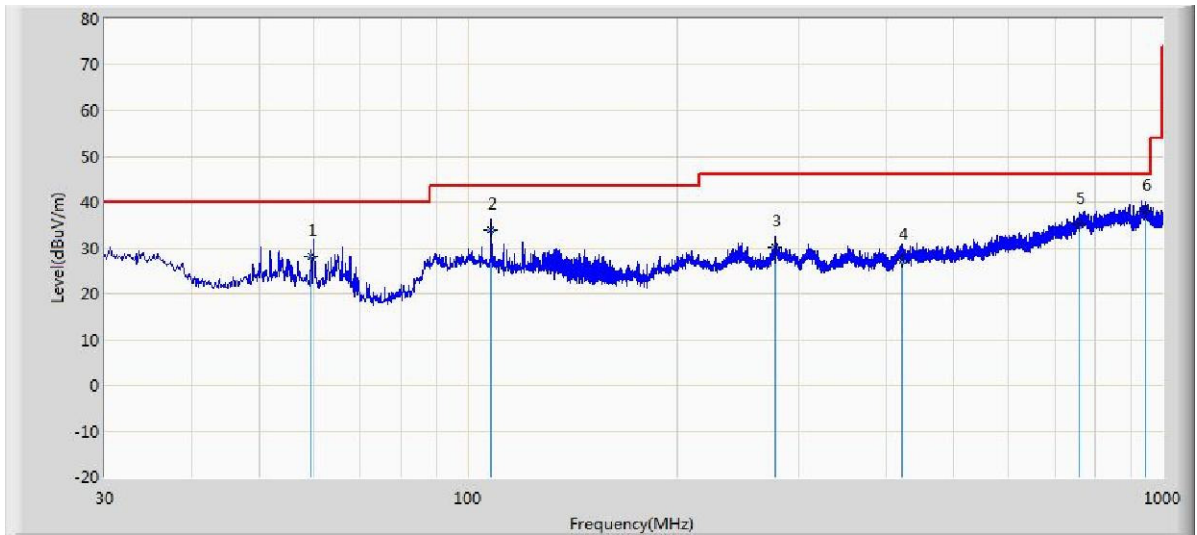
Chain	CH	Antenna	Frequency (MHz)	Reading Level (dB μ V/m)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
Ant 0	1	H	30.101	34.855	-3.740	31.115	40.000	8.885	QP
		H	66.200	43.222	-15.811	27.411	40.000	12.589	QP
		H	108.101	38.661	-10.110	28.551	43.500	14.949	QP
		H	236.504	37.704	-10.551	27.153	46.000	18.847	QP
		H	425.401	35.995	-4.126	31.869	46.000	14.131	QP
		H	760.204	33.495	0.309	33.804	46.000	12.196	QP
		V	59.512	43.868	-15.612	28.256	40.000	11.744	QP
		V	107.822	43.929	-10.143	33.786	43.500	9.714	QP
		V	276.601	38.588	-8.474	30.114	46.000	15.886	QP
		V	420.914	31.445	-4.252	27.193	46.000	18.807	QP
		V	758.601	34.699	0.286	34.985	46.000	11.015	QP
		V	946.500	35.966	1.910	37.876	46.000	8.124	QP

Note 1: The worst case of Radiated Emission below 1GHz:

Polarity: Horizontal



Polarity: Vertical



5. Emissions in non-restricted frequency bands

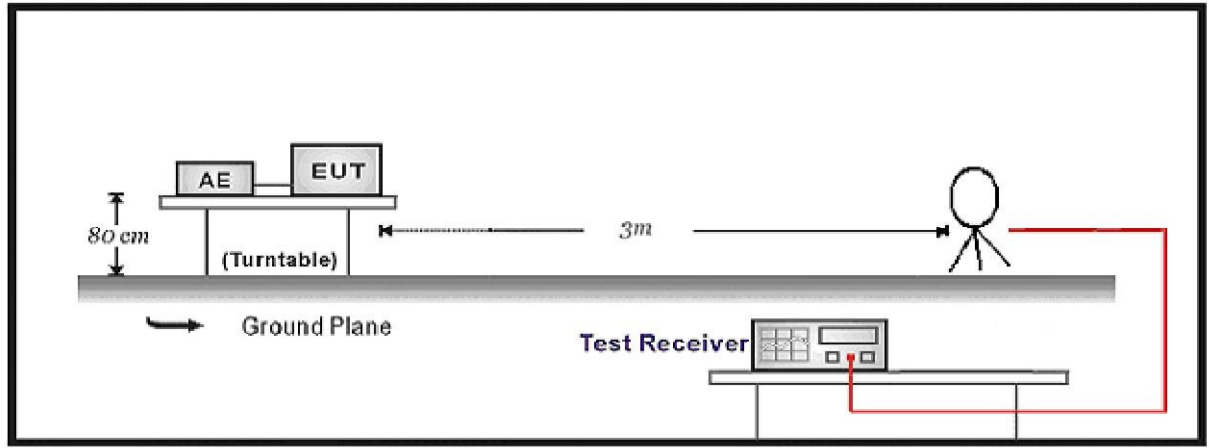
5.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.05	2017.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.16	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.02	2017.03.01
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

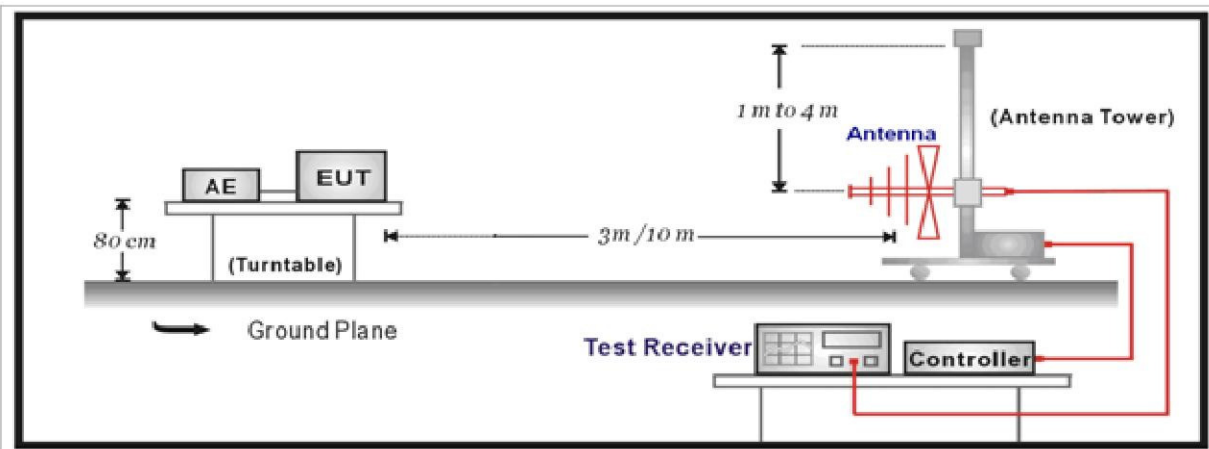
Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2016.03.05	2017.03.04
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	Quietek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

5.2. Test Setup

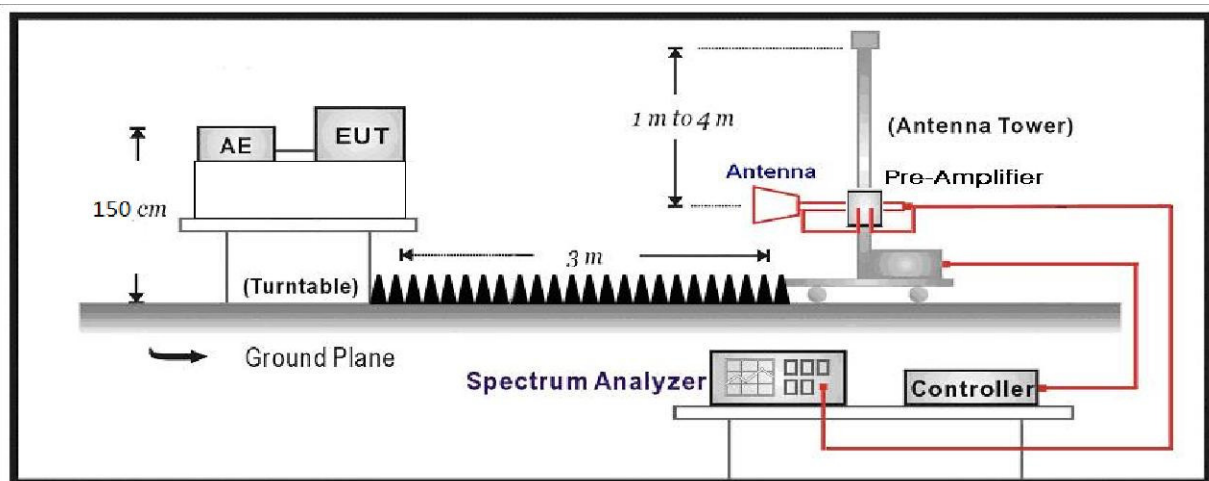
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



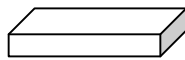
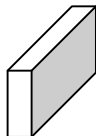
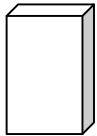
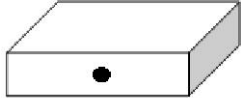
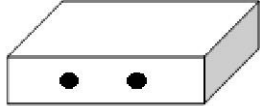
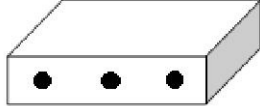
5.3. Limit

Un-Restricted Band Emissions Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30c(Note1)
RF Output power(PK detector)	20c(Note2)
<p>Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).</p> <p>Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).</p>	

5.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input checked="" type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

5.5. EUT test Axis definition

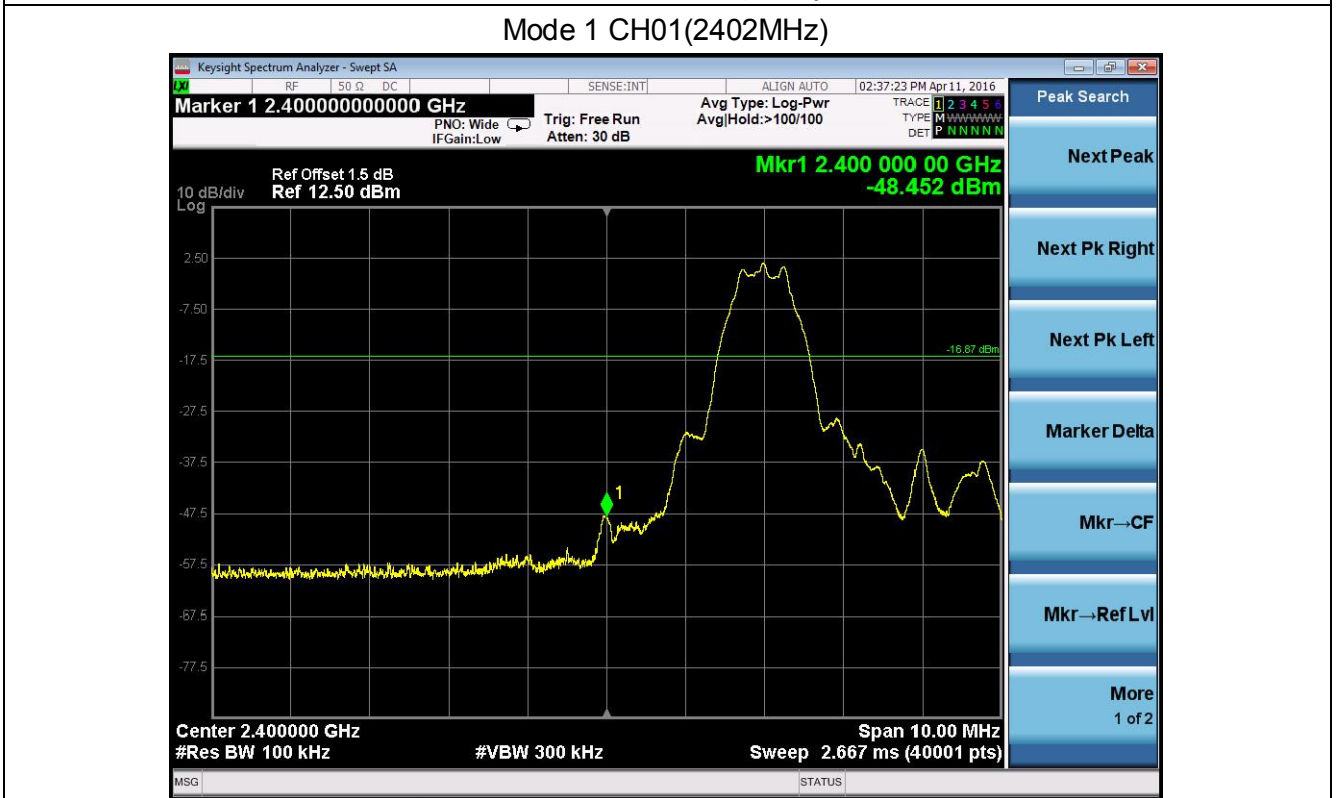
Item	Emissions in non-restricted frequency bands			
Device Category	<input checked="" type="checkbox"/>	Fixed position use		
	<input type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

5.6. Test Result

Product Name	: BLUETOOTH SPEAKER	Test Power	: DC 5V
Test Site	: TR8		

Mode	Channel	Test Frequency (MHz)	In-Band PSD[a] (dBm/100kHz)	Frequency (MHz)	Out-Band PSD[b] (dBm/100kHz)	[a]-[b] (dB)	Limit (dB)	Result
1	00	2402	3.13	2400.00	-48.45	51.58	>30	Pass
1	39	2480	3.13	2483.50	-57.18	60.31	>30	Pass

Note: The worst case of Emissions in non-restricted frequency bands as below:

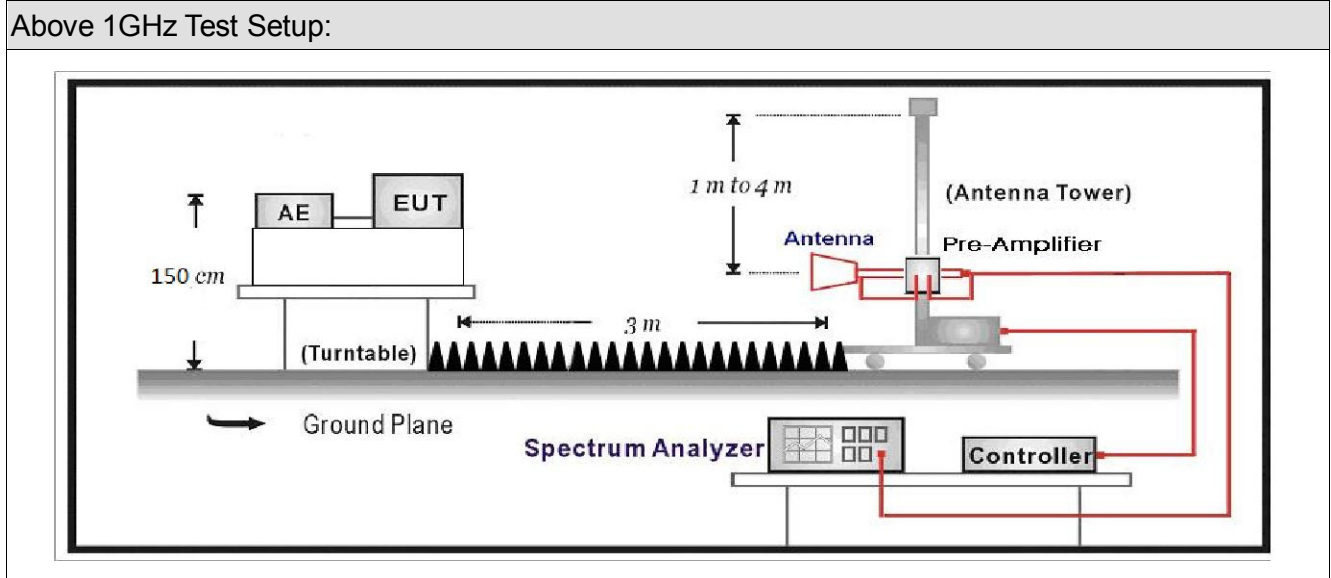


6. Radiated Emission Band Edge

6.1. Test Equipment

Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	Quietek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

6.2. Test Setup



6.3. Limit

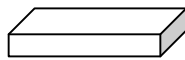
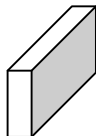
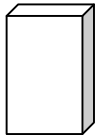
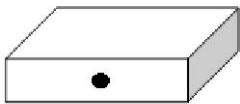
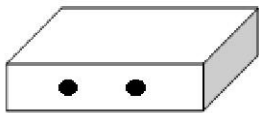
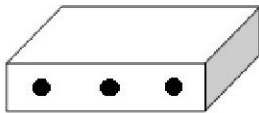
Band edge Limit				
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

6.4. Test Procedure

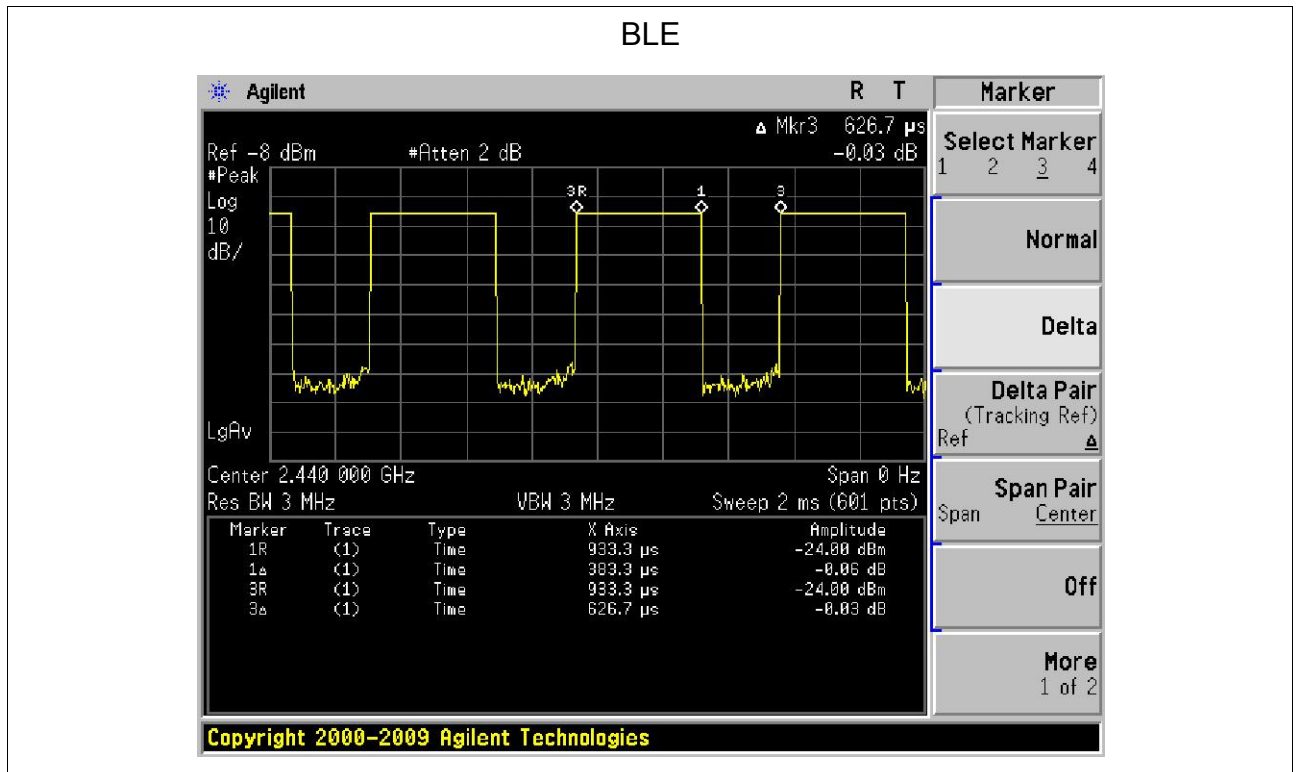
Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.10	Band-edge testing
	<input type="checkbox"/> ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	<input checked="" type="checkbox"/> ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

6.5. EUT test definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input checked="" type="checkbox"/>	Fixed position use		
	<input type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input checked="" type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

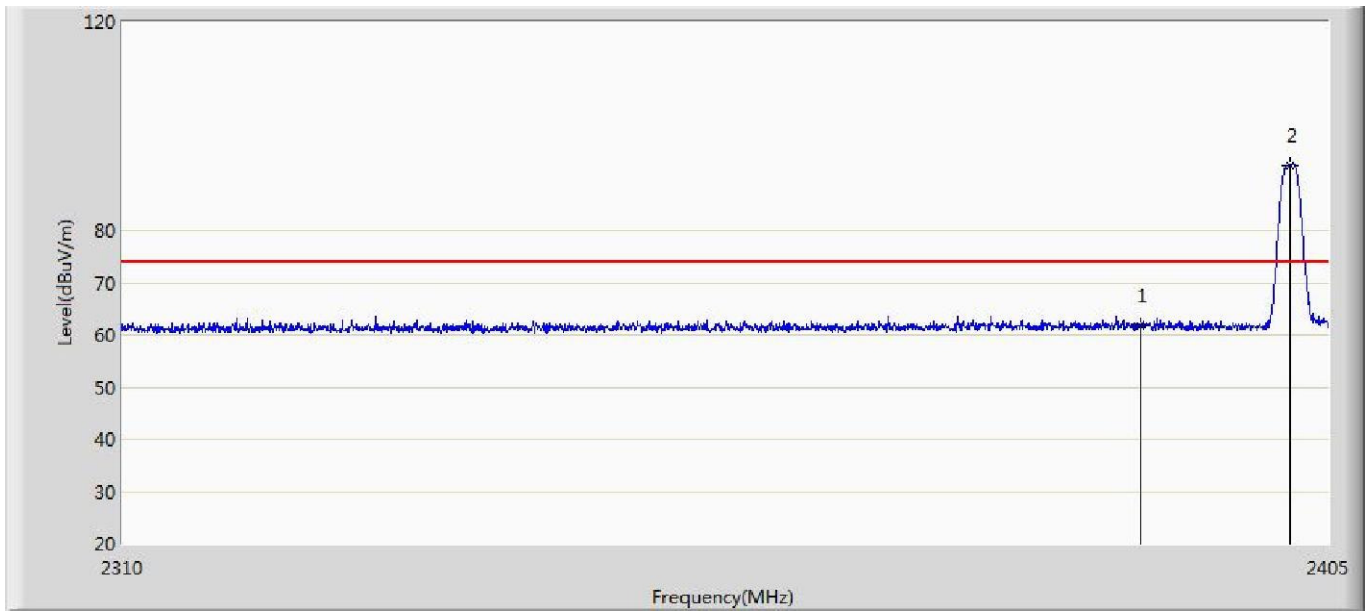
6.6. Duty Cycle

Test Mode	Tx On (ms)	Tx Off (ms)	Reduced VBW according to 1/T (kHz)	Tx On + Tx Off (ms)	Duty Cycle
BLE	0.3833	0.2434	2.7	0.6267	BLE



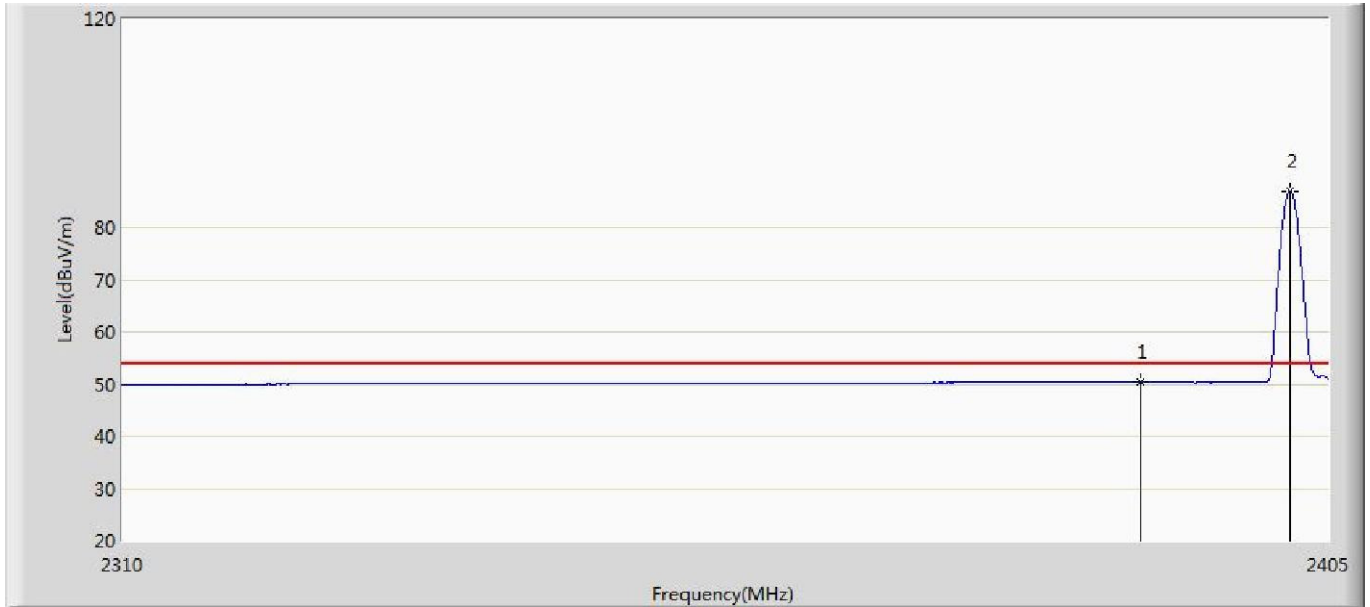
6.7. Test Result

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Transmit at channel 2402Mhz by BLE	



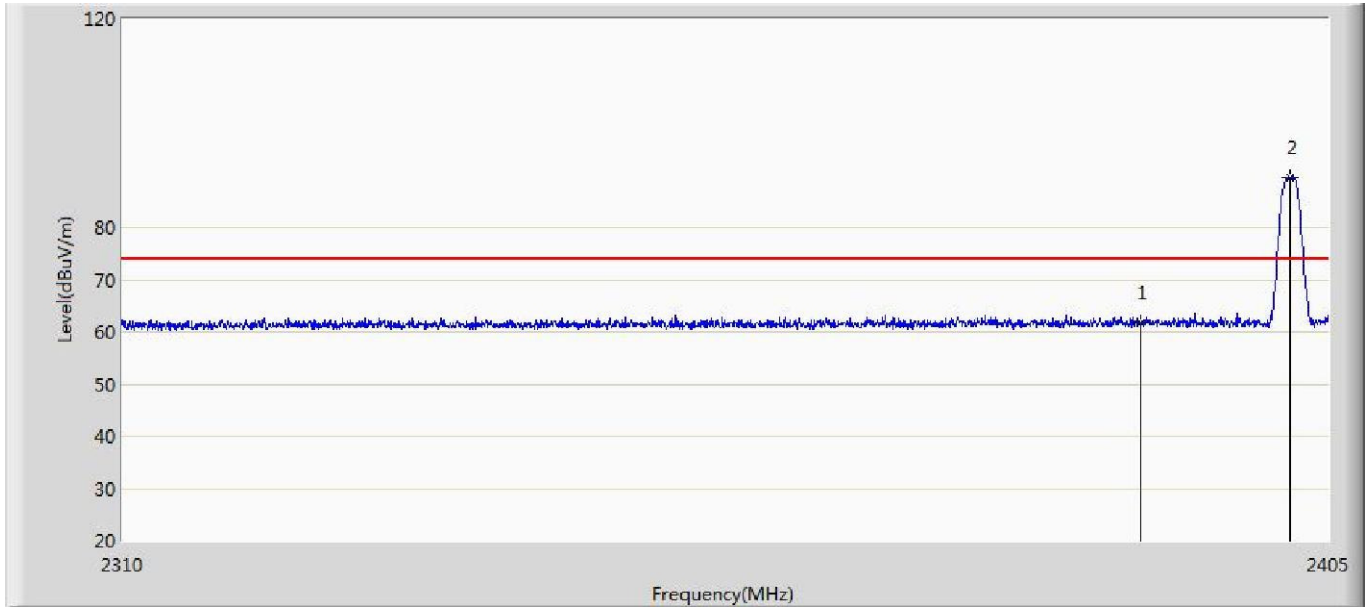
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	61.643	24.288	-12.357	74.000	37.355	PK
2	*	2402.000	92.530	55.188	N/A	N/A	37.341	PK

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Transmit at channel 2402Mhz by BLE	



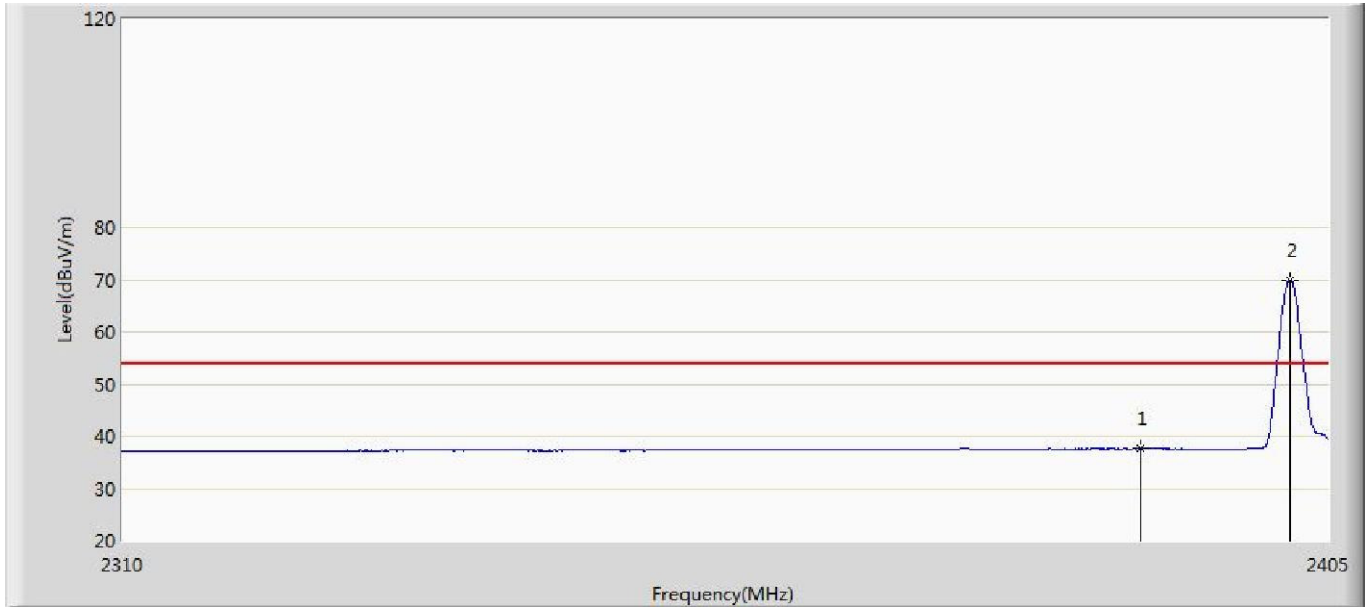
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	50.384	13.029	-3.616	54.000	37.355	AV
2	*	2402.000	87.080	49.738	N/A	N/A	37.341	AV

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Transmit at channel 2402Mhz by BLE	



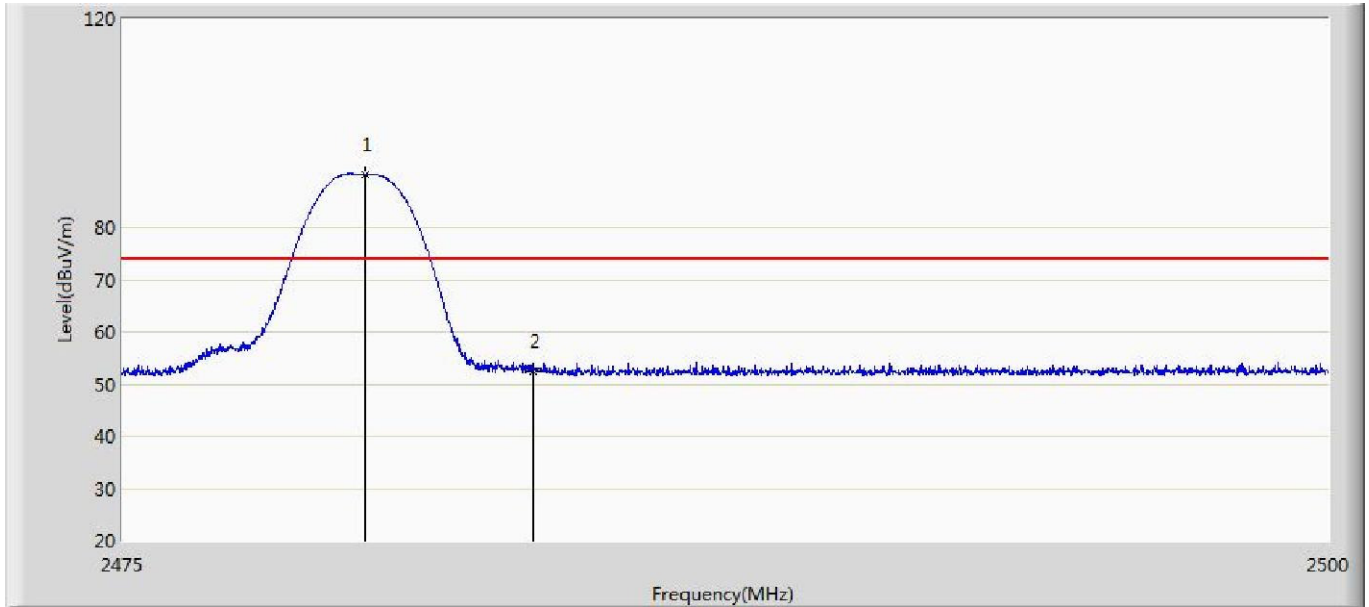
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	61.596	24.241	-12.404	74.000	37.355	PK
2	*	2402.000	89.507	52.165	N/A	N/A	37.341	PK

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:23
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Transmit at channel 2402Mhz by BLE	



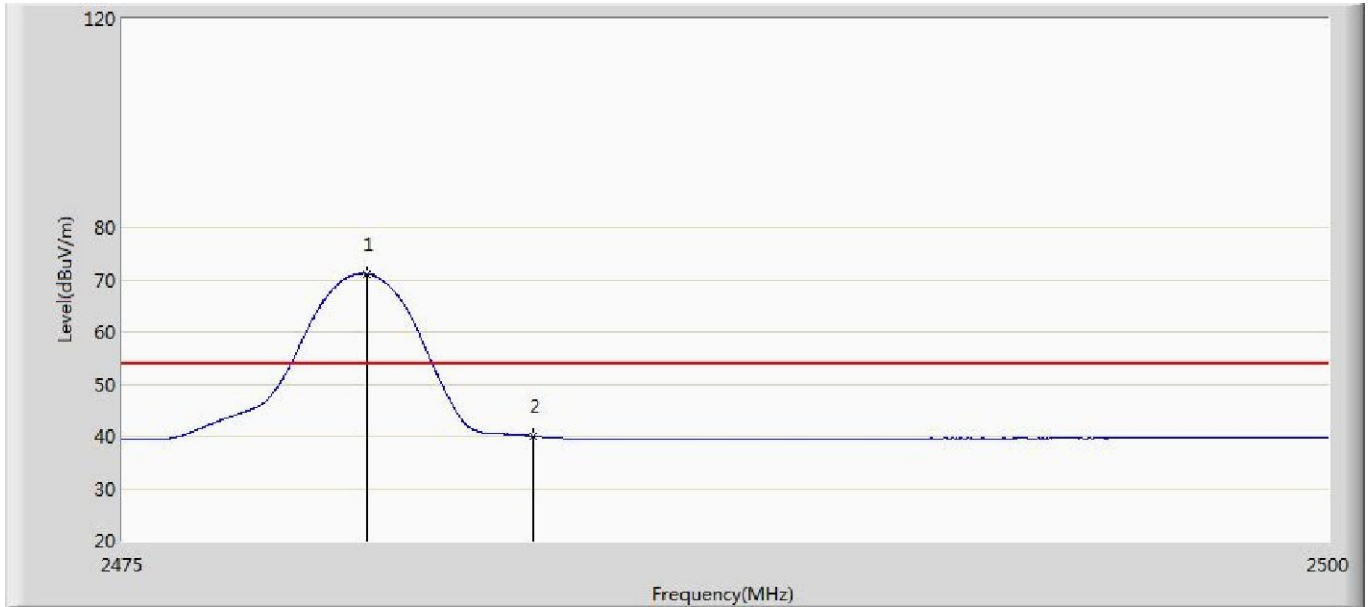
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	37.537	0.182	-16.463	54.000	37.355	AV
2	*	2402.000	69.966	32.624	N/A	N/A	37.341	AV

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



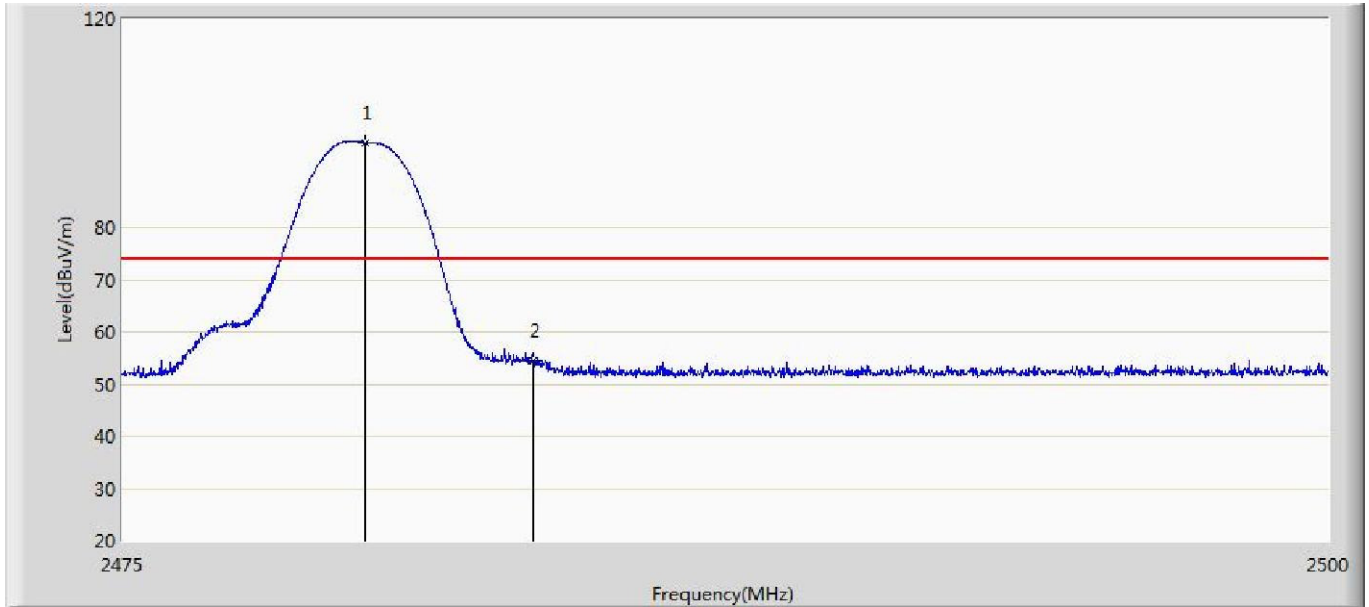
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.012	90.127	52.641	N/A	N/A	37.486	PK
2		2483.500	52.325	14.814	-21.675	74.000	37.511	PK

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



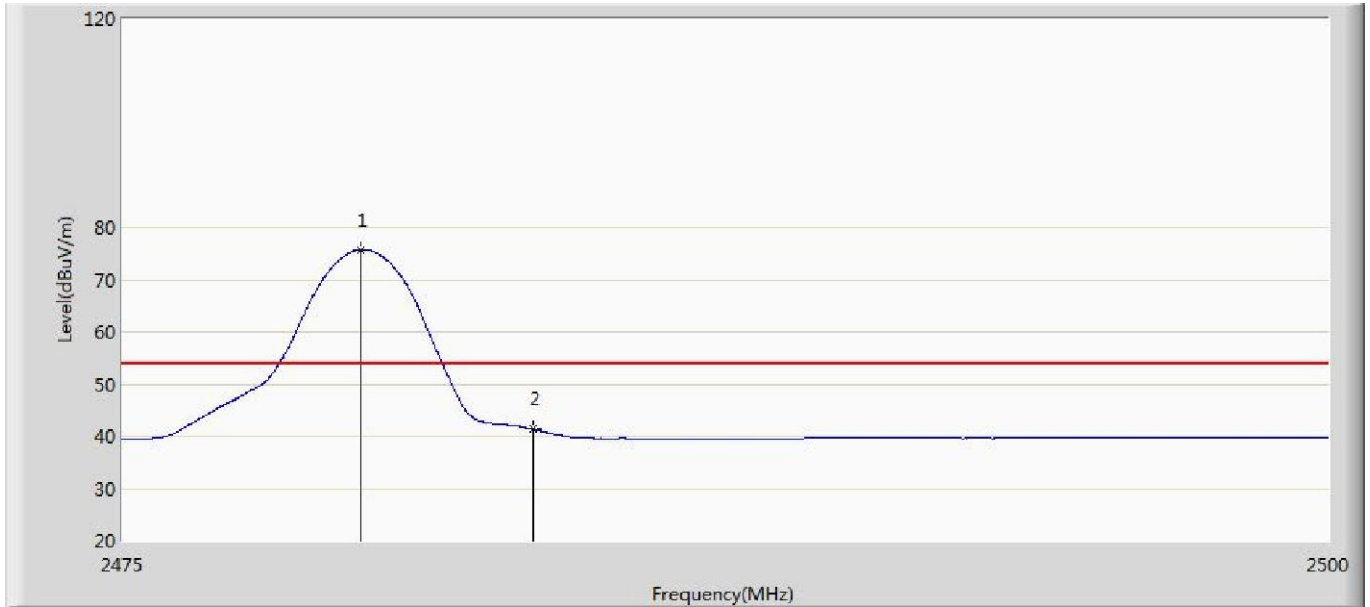
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.050	71.127	33.641	N/A	N/A	37.486	AV
2		2483.500	40.039	2.528	-13.961	54.000	37.511	AV

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.012	96.307	58.821	N/A	N/A	37.486	PK
2		2483.500	54.547	17.036	-19.453	74.000	37.511	PK

Engineer:	
Site: AC5	Time: 2016/04/13 - 10:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: BLUETOOTH SPEAKER	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.937	75.718	38.232	N/A	N/A	37.486	AV
2		2483.500	41.364	3.853	-12.636	54.000	37.511	AV

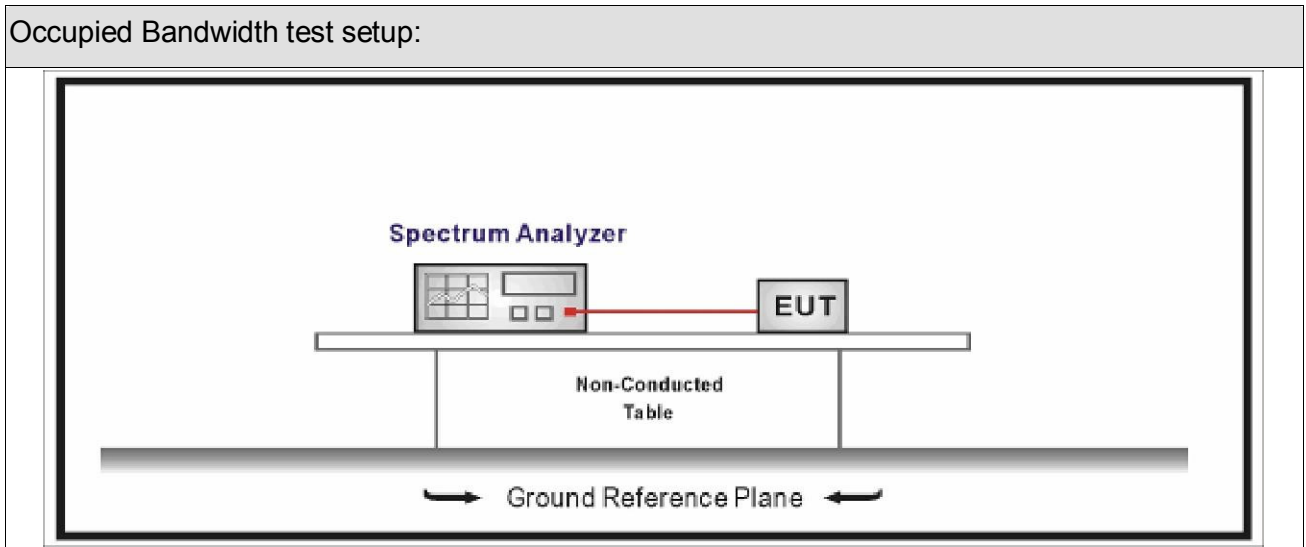
7. Occupied Bandwidth

7.1. Test Equipment

Occupied Bandwidth / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2015.04.10	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



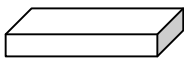
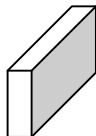
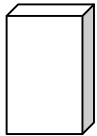
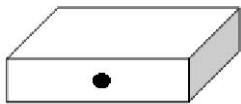
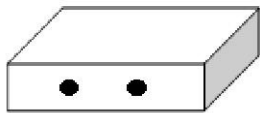
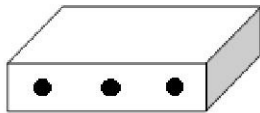
7.3. Limit

Occupied Bandwidth
Systems using digital modulation techniques operate in the 2400-2483.5 MHz .The minimum 6 dB bandwidth shall be at least 500 kHz

7.4. Test Procedure

Test Method			
	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.8	DTS bandwidth
<input type="checkbox"/>	ANSI C63.10	11.8.1	Option 1
<input checked="" type="checkbox"/>	ANSI C63.10	11.8.2	Option 2

7.5. EUT test definition

Item	Occupied Bandwidth			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1, Mode 2, Mode 3, Mode 4			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

7.6. Test Result

Product Name	: BLUETOOTH SPEAKER	Test Power	: DC 5V
Test Site	: TR-8		

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (kHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
1	00	2402	1052.9	711.5	>500	Pass
1	19	2440	1052.9	708.9	>500	Pass
1	39	2480	1053.8	709.3	>500	Pass

Note : The worst case of Occupied Bandwidth as below:

Mode 1 CH00 (2402MHz)



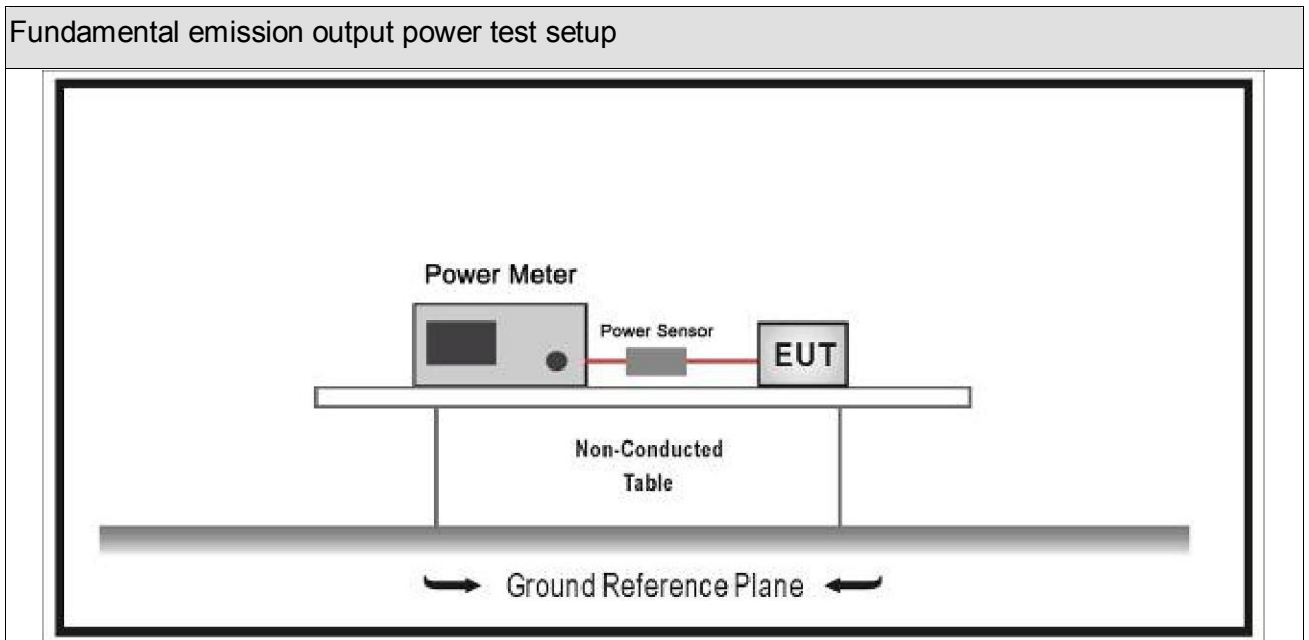
8. Fundamental emission output power

8.1. Test Equipment

Fundamental emission output power/ TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2015.11.11	2016.11.10
Power Sensor	Anritsu	MA2411B	0846014	2015.11.11	2016.11.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2015.04.10	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



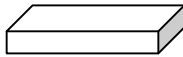
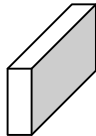
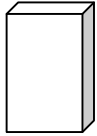
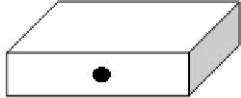
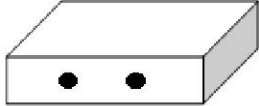
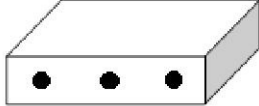
8.3. Limit

Fundamental emission output power Limit		
<input checked="" type="checkbox"/>	$G_{TX} < 6\text{dBi}$	$P_{out} \leq 30\text{dBm}$
<input type="checkbox"/>	$G_{TX} > 6\text{dBi}$	
<input type="checkbox"/>	Non-Fix point-point	$P_{out} \leq 30 - (G_{TX} - 6)$
<input type="checkbox"/>	Fix point-point	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	Point-to-multipoint	$P_{out} \leq 30 - (G_{TX} - 6)$
<input type="checkbox"/>	Overlap Beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	Aggregate power transmitted simultaneously on all beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
<input type="checkbox"/>	single directional beam	$P_{out} \leq 30 - [(G_{TX} - 6)]/3 + 8\text{dB}$
<p>Note 1 : G_{TX} directional gain of transmitting antennas.</p> <p>Note 2 : P_{out} is maximum peak conducted output power .</p>		

8.4. Test Procedure

Fundamental emission output power Test Method					
	References Rule		Chapter	Description	
<input checked="" type="checkbox"/>	ANSI C63.10		11.9	Fundamental emission output power	
	<input checked="" type="checkbox"/>	ANSI C63.10		11.9.1	Maximum peak conducted output power
	<input type="checkbox"/>	ANSI C63.10	11.9.1.1	RBW \geq DTS bandwidth	
	<input type="checkbox"/>	ANSI C63.10	11.9.1.2	Integrated band power method	
	<input checked="" type="checkbox"/>	ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method	
	<input type="checkbox"/>	ANSI C63.10		11.9.2	Maximum conducted (average) output power
	<input type="checkbox"/>	ANSI C63.10		11.9.2.2	Measurement using a spectrum analyzer (SA)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle \geq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle \geq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle \leq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle \leq 98%)	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.4	Method AVGSA-3	
	<input type="checkbox"/>	ANSI C63.10	11.9.2.2.5	Method AVGSA-3A	
	<input type="checkbox"/>	ANSI C63.10		11.9.2.3	Measurement using a power meter (PM)
	<input type="checkbox"/>	ANSI C63.10	11.9.2.3.1	Method AVGPM	
<input type="checkbox"/>	ANSI C63.10	11.9.2.3.2	Method AVGPM-G		

8.5. EUT test definition

Item	Fundamental emission output power			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

8.6. Test Result

Product Name	:	BLUETOOTH SPEAKER	Test Power	:	DC 5V
Test Site	:	TR8			

Mode	Channel	Test Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
1	00	2402	1.72	30	Pass
1	19	2440	3.41	30	Pass
1	39	2480	4.06	30	Pass

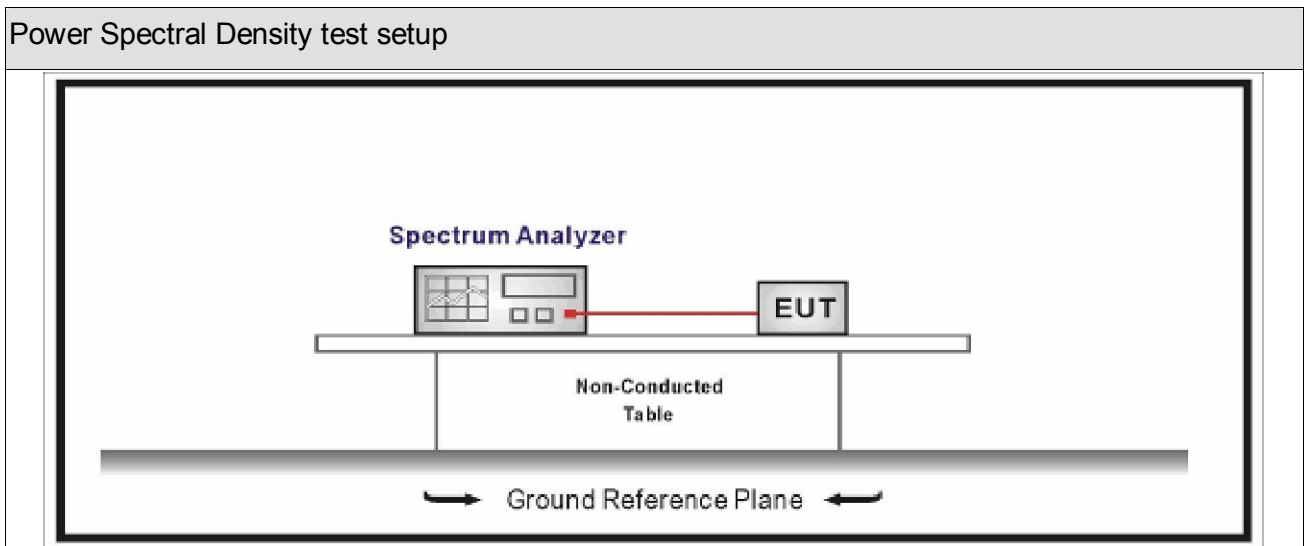
9. Power Spectral Density

9.1. Test Equipment

Power Spectral Density / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2015.04.10	2016.04.09

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



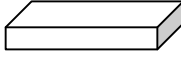
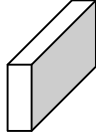
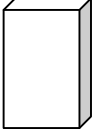
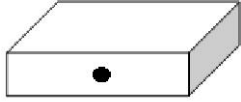
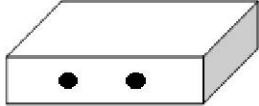
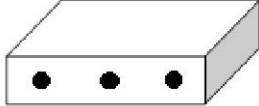
9.3. Limit

Power Spectral Density Limit
Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$

9.4. Test Procedure

Power Spectral Density Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.10	Maximum power spectral density level in the fundamental emission
<input checked="" type="checkbox"/>	ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
<input type="checkbox"/>	ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle \geq 98%)
<input type="checkbox"/>	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle \geq 98%)
<input type="checkbox"/>	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle $<$ 98%)
<input type="checkbox"/>	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle $<$ 98%)
<input type="checkbox"/>	ANSI C63.10	11.10.7	Method AVGPSD-3
<input type="checkbox"/>	ANSI C63.10	11.10.8	Method AVGPSD-3A

9.5. EUT test definition

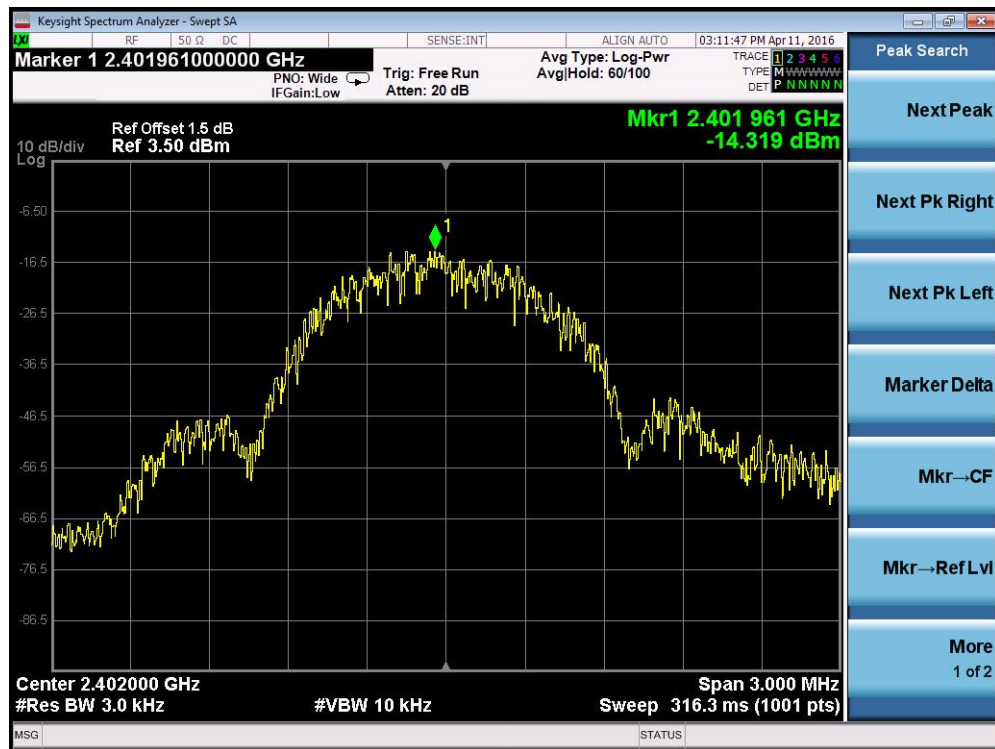
Item	Power Spectral Density Test Method			
Device Category	<input type="checkbox"/>	Fixed position use		
	<input checked="" type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

9.6. Test Result

Product Name	: BLUETOOTH SPEAKER	Test Power	: DC 5V
Test Site	: TR8		

Mode	Channel	Test Frequency (MHz)	Measurement PSD (dBm/3kHz)	Total PSD (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
			Ant 0				
1	00	2402	-14.319	-14.319	0	8	Pass
1	19	2440	-12.496	-12.496	0	8	Pass
1	39	2480	-11.589	-11.589	0	8	Pass

Mode 1 CH39(2480MHz)



The End