

APPLICATION CERTIFICATION
On Behalf of
Sure Wave (HongKong) Limited

iColor Lighting Bluetooth Speaker
Model No.: CQZ501-B

FCC ID:2AAPLCQZ501-B

Prepared for : Sure Wave (HongKong) Limited
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Date of Test : December 24-25, 2013
Date of Report : December 30, 2013

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Test Report Certification

Applicant : Sure Wave (HongKong) Limited
Manufacturer : Sure Wave (HongKong) Limited
EUT Description : iColor Lighting Bluetooth Speaker
(A) MODEL NO.: CQZ501-B
(B) SERIAL NO.: N/A
(C) POWER SUPPLY: DC 3.7V (Lithium ion battery) & DC 5V
(Power by USB port)

Measurement Procedure Used:

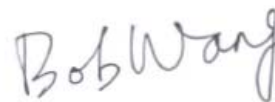
FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.4- 2009

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : December 24-25, 2013

Prepared by :



(Engineer)

Approved & Authorized Signer :



(Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	iColor Lighting Bluetooth Speaker
Model Number	:	CQZ501-B
Frequency Band	:	2402MHz-2480MHz
Number of Channels	:	79
Modulation type	:	GFSK
Antenna Gain	:	0dBi
Power Supply	:	DC 3.7V (Lithium ion battery) & DC 5V (Power by USB port)
Applicant	:	Sure Wave (HongKong) Limited
Address	:	A-703,Building 2, TianAn Cyber Park, Huangge North Road, Longgang District, Shenzhen, 518172, China
Manufacturer	:	Sure Wave (HongKong) Limited
Address	:	A-703,Building 2, TianAn Cyber Park, Huangge North Road, Longgang District, Shenzhen, 518172, China
Date of sample received	:	December 23, 2013
Date of Test	:	December 24-25, 2013

1.2. Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee
for Laboratories
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD

Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd.
Science & Industry Park, Nanshan, Shenzhen, Guangdong
P.R. China

1.3. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 12, 2013	Jan. 11, 2014
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 12, 2013	Jan. 11, 2014
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 12, 2013	Jan. 11, 2014
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 12, 2013	Jan. 11, 2014
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Feb. 06, 2013	Feb. 05, 2014
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Feb. 06, 2013	Feb. 05, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Feb. 06, 2013	Feb. 05, 2014
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 12, 2013	Jan. 11, 2014
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 12, 2013	Jan. 11, 2014

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode

Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2.Configuration and peripherals



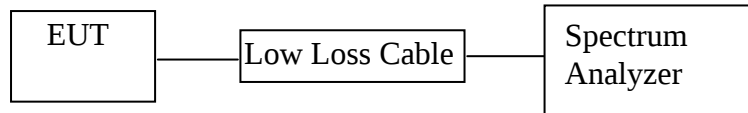
(EUT: iColor Lighting Bluetooth Speaker)

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

5.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): 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.

5.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number	:	CQZ501-B
Serial Number	:	N/A
Manufacturer	:	Sure Wave (HongKong) Limited

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5. Test Procedure

5.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2. Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz.

5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

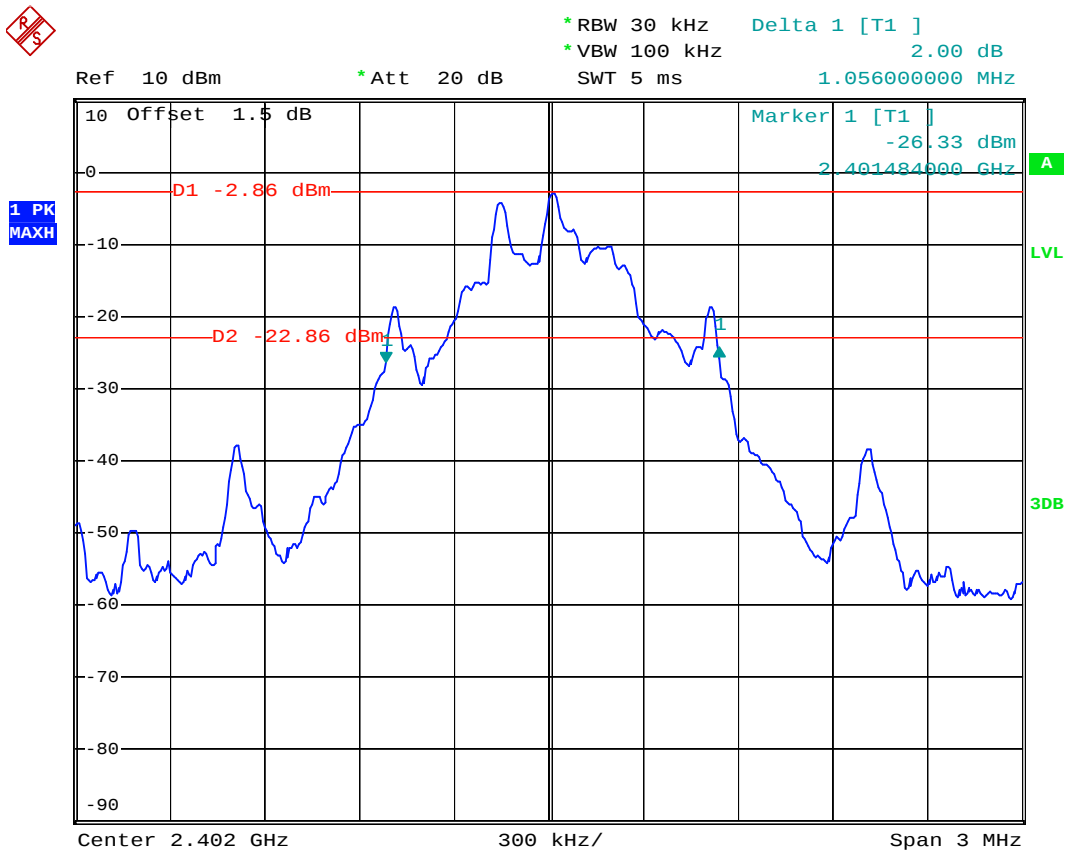
5.6. Test Result

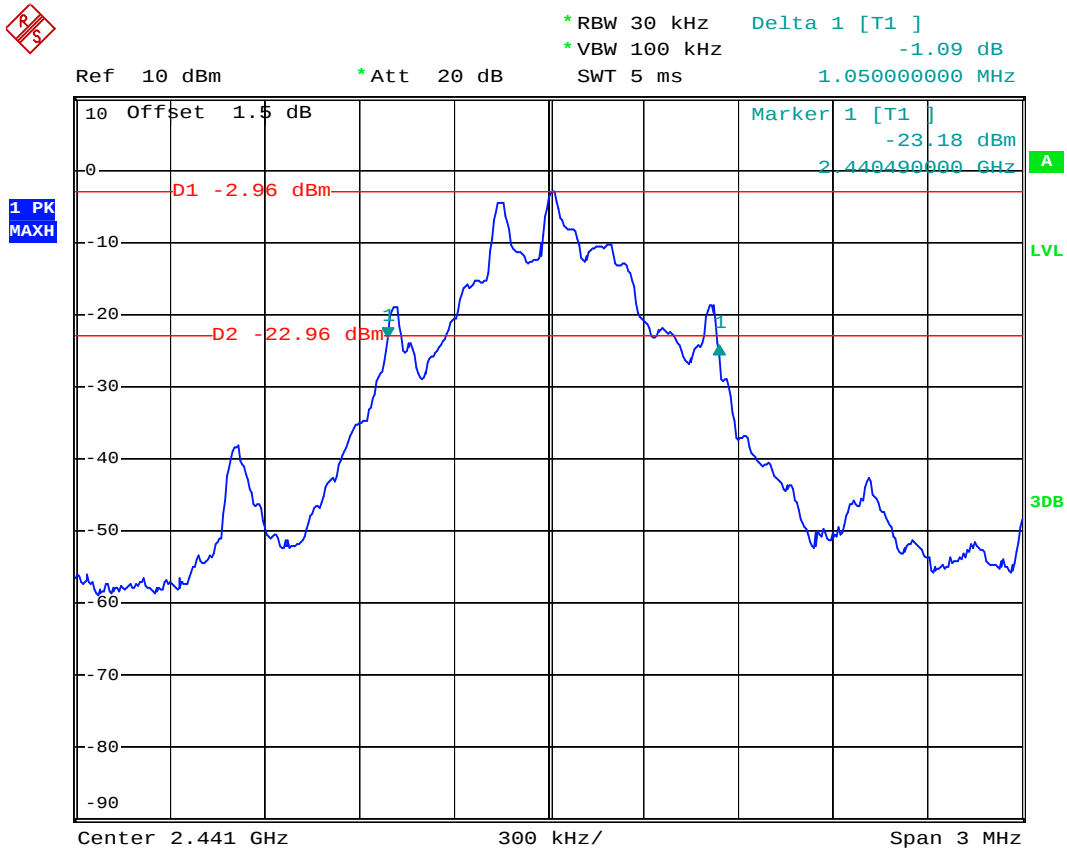
PASS.

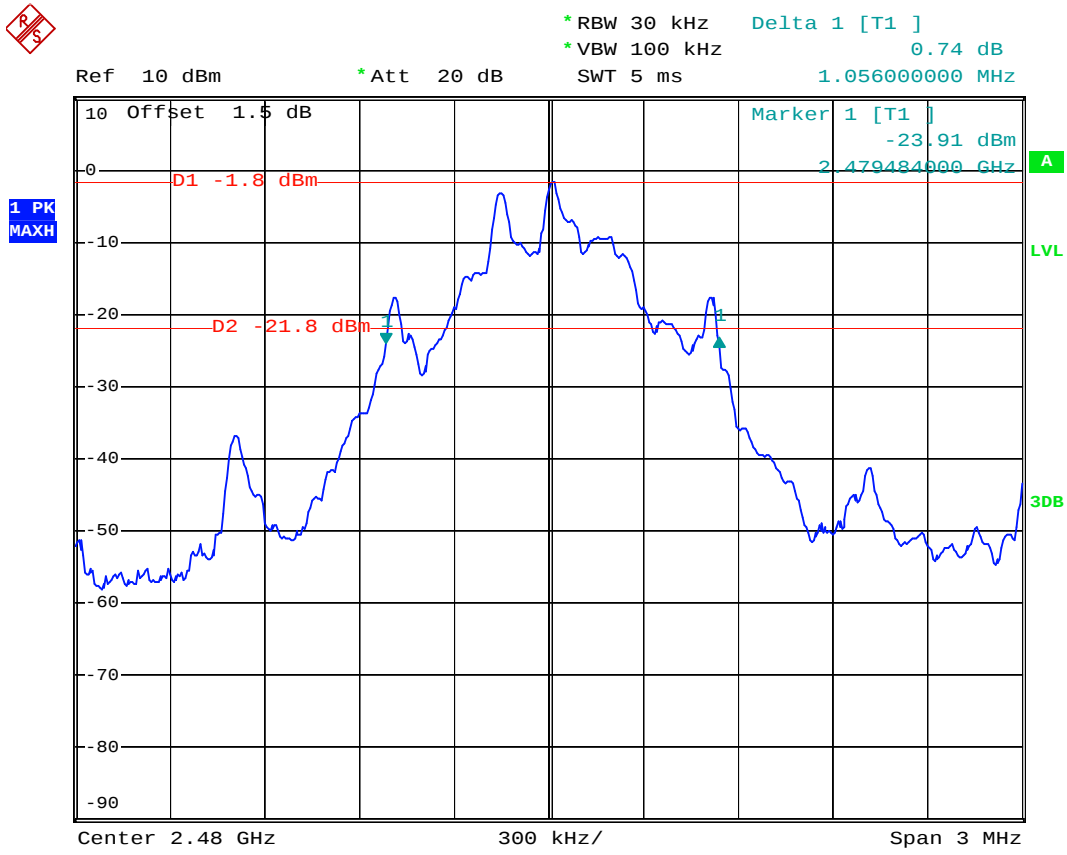
Date of Test:	<u>December 24, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Rickey</u>

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2402	1.056	---
Middle	2441	1.050	---
High	2480	1.056	---

The spectrum analyzer plots are attached as below.

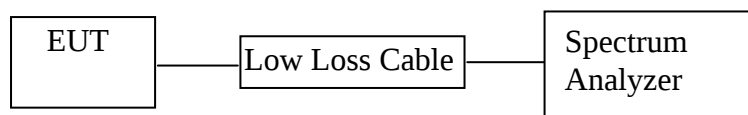






6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

6.2. The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): 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. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number	: CQZ501-B
Serial Number	: N/A
Manufacturer	: Sure Wave (HongKong) Limited

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5. Test Procedure

- 6.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 6.5.2. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz. Adjust Span to 3 MHz.
- 6.5.3. Set the adjacent channel of the EUT maxhold another trace.
- 6.5.4. Measurement the channel separation

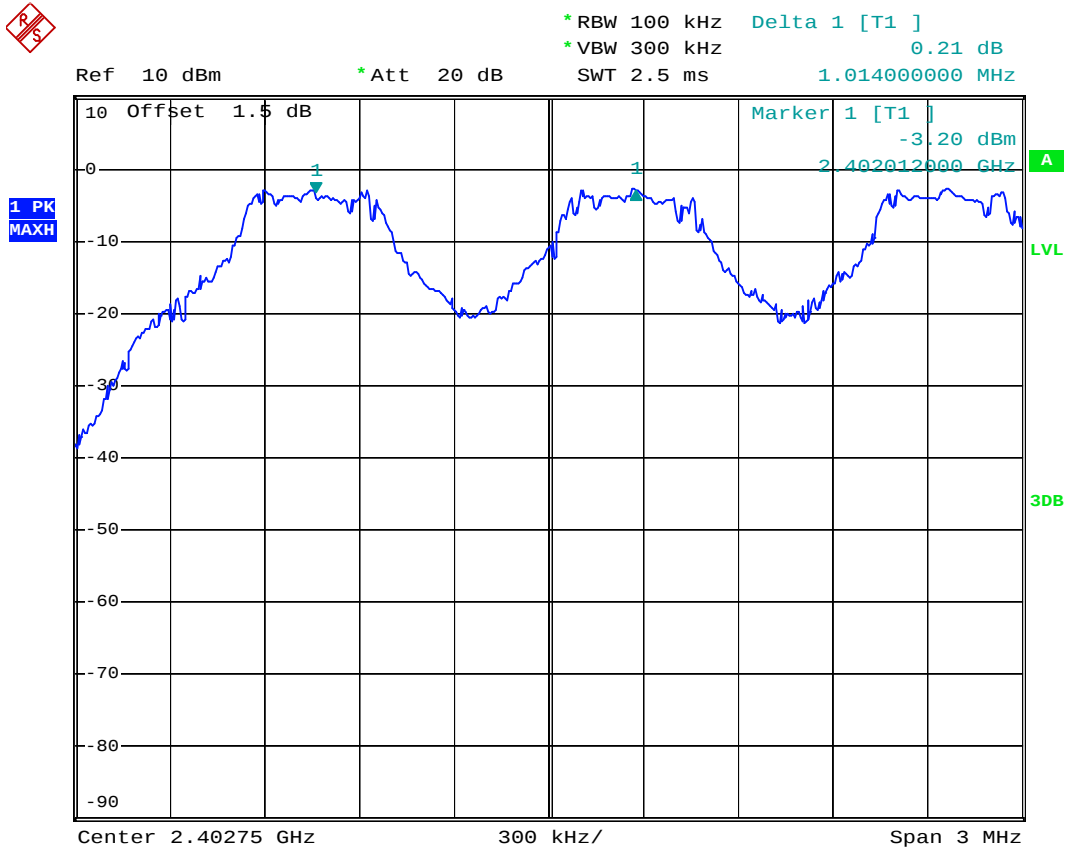
6.6. Test Result

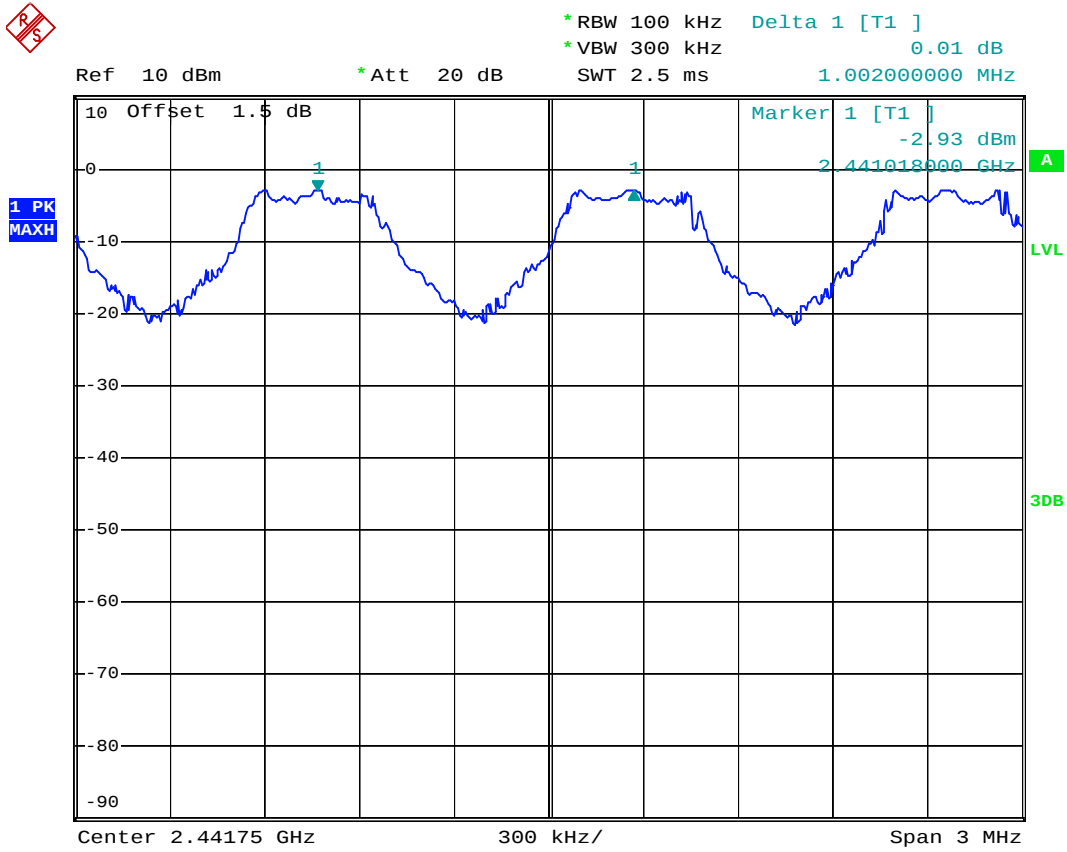
PASS.

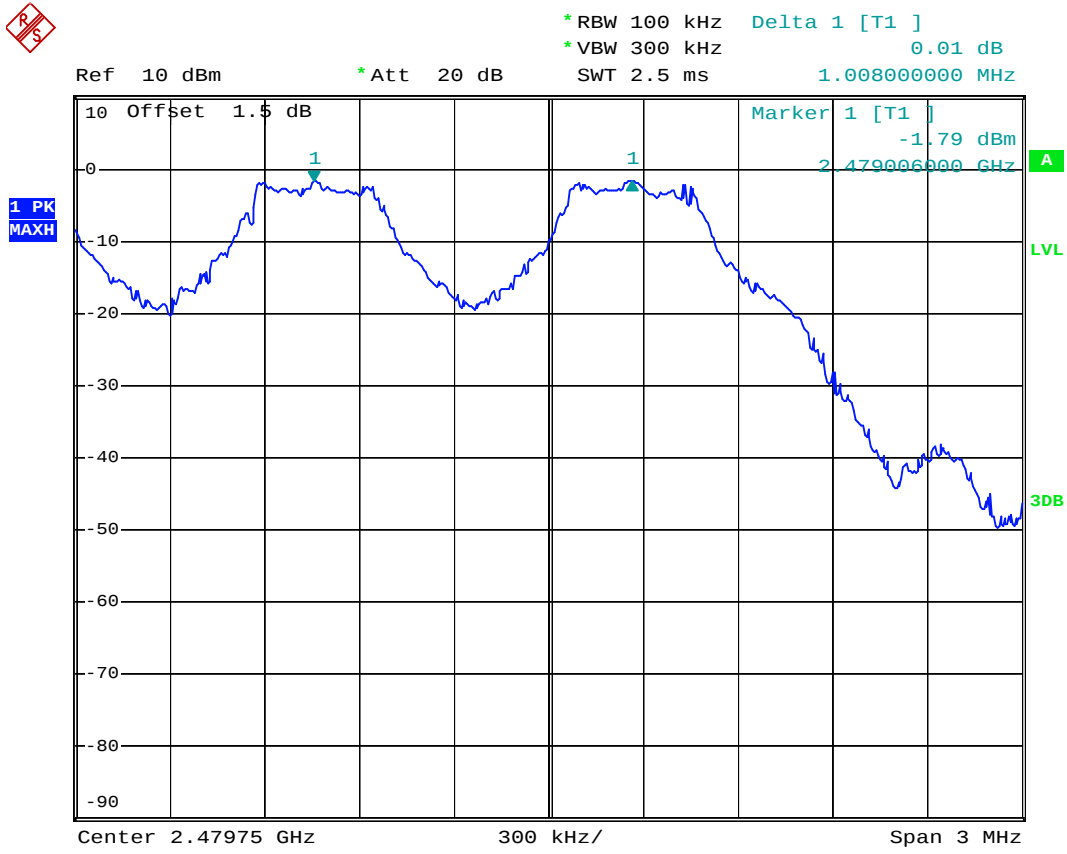
Date of Test:	<u>December 24, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Rickey</u>

Channel	Channel Frequency (MHz)	Channel separation (MHz)	Limit (MHz)
Low	2402	1.014	0.704
Middle	2441	1.002	0.700
High	2480	1.008	0.704

The spectrum analyzer plots are attached as below.

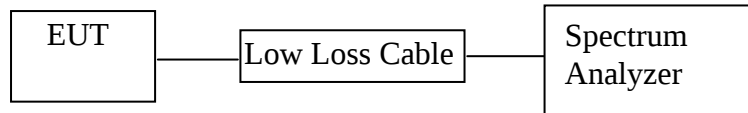






7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

7.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number	:	CQZ501-B
Serial Number	:	N/A
Manufacturer	:	Sure Wave (HongKong) Limited

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX (Hopping on) modes measure it.

7.5. Test Procedure

7.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2. Set the spectrum analyzer as Span=83.5MHz, RBW=100 kHz, VBW=300 kHz.

7.5.3. Max hold, view and count how many channel in the band.

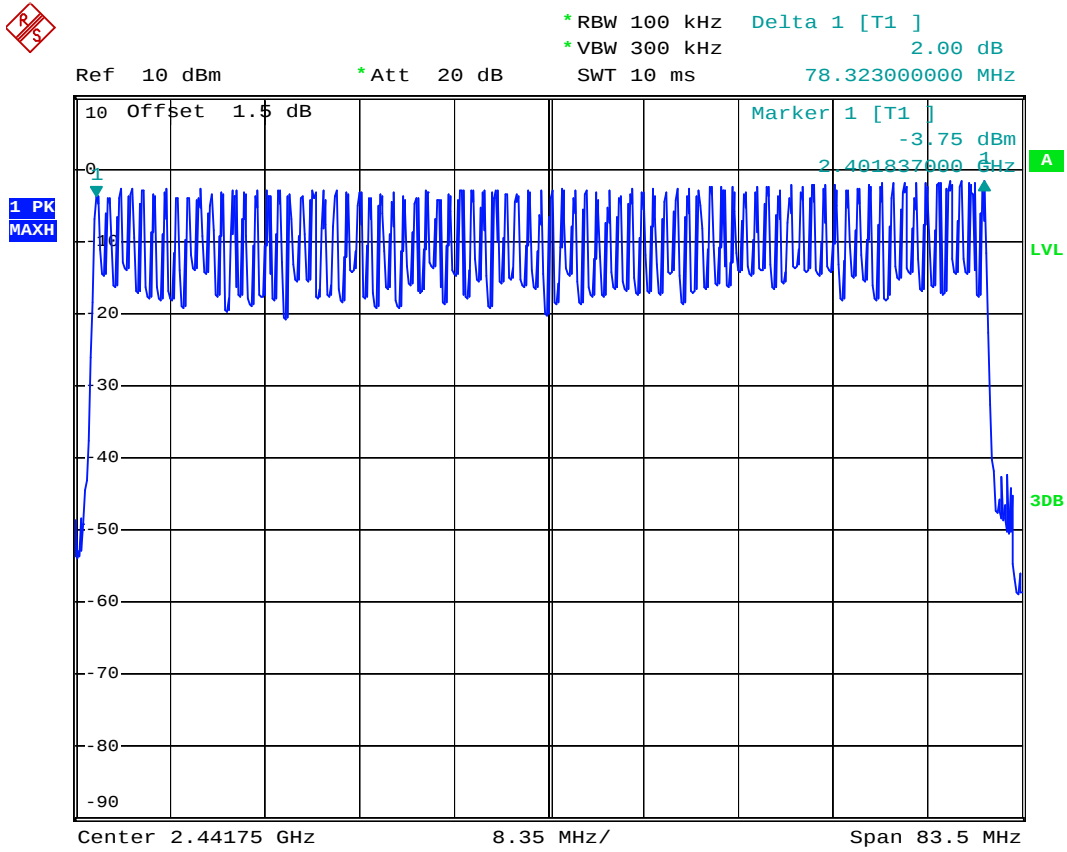
7.6. Test Result

PASS.

Date of Test:	<u>December 24, 2013</u>	Temperature:	<u>25°C</u>
	<u>iColor Lighting Bluetooth</u>		
EUT:	<u>Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>Hopping</u>	Test Engineer:	<u>Rickey</u>

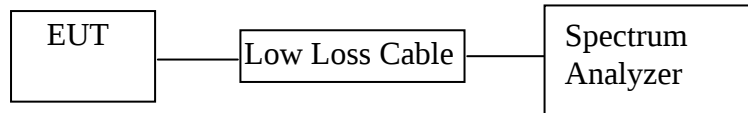
Total number of hopping channel	Measurement result (CH)	Limit (CH)
	79	>15

The spectrum analyzer plots are attached as below.



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

8.2. The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on Measurement

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number	:	CQZ501-B
Serial Number	:	N/A
Manufacturer	:	Sure Wave (HongKong) Limited

8.4. Operating Condition of EUT

8.4.1. Setup the EUT and simulator as shown as Section 8.1.

8.4.2. Turn on the power of all equipment.

8.4.3. Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5. Test Procedure

- 8.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 8.5.2. Set center frequency of spectrum analyzer = operating frequency.
- 8.5.3. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span=0Hz, Adjust Sweep=1s. Get the burst (in 1 sec.).
- 8.5.4. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=2ms. Get the pulse time.
- 8.5.5. Repeat above procedures until all frequency measured were complete.

8.6. Test Result

PASS.

Date of Test:	<u>December 24, 2013</u>	Temperature:	<u>25°C</u>
	<u>iColor Lighting Bluetooth</u>		
EUT:	<u>Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Rickey</u>

DH1:

A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$

Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	0.534	170.88	400
Middle	2441	0.540	172.80	400
High	2480	0.534	170.88	400

DH3:

A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$

Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	1.797875	287.66	400
Middle	2441	1.815875	290.54	400
High	2480	1.815875	290.54	400

DH5:

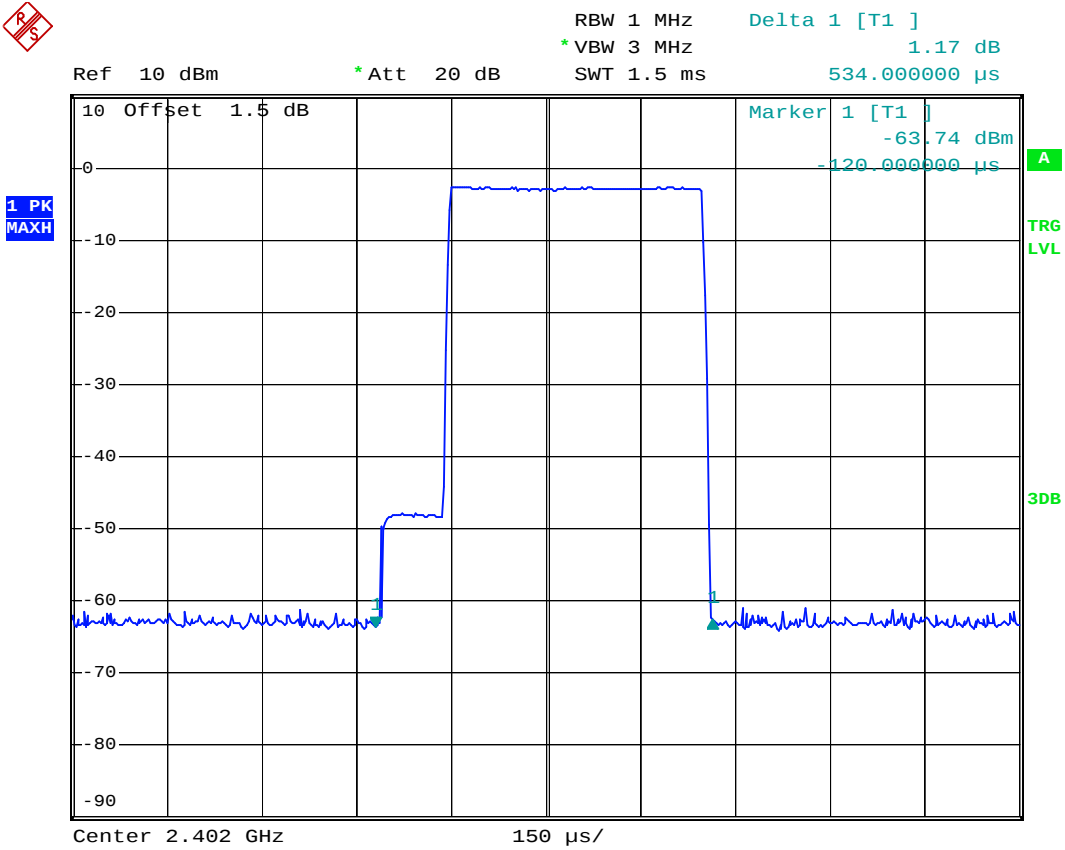
A period transmit time = $0.4 \times 79 = 31.6$

Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$

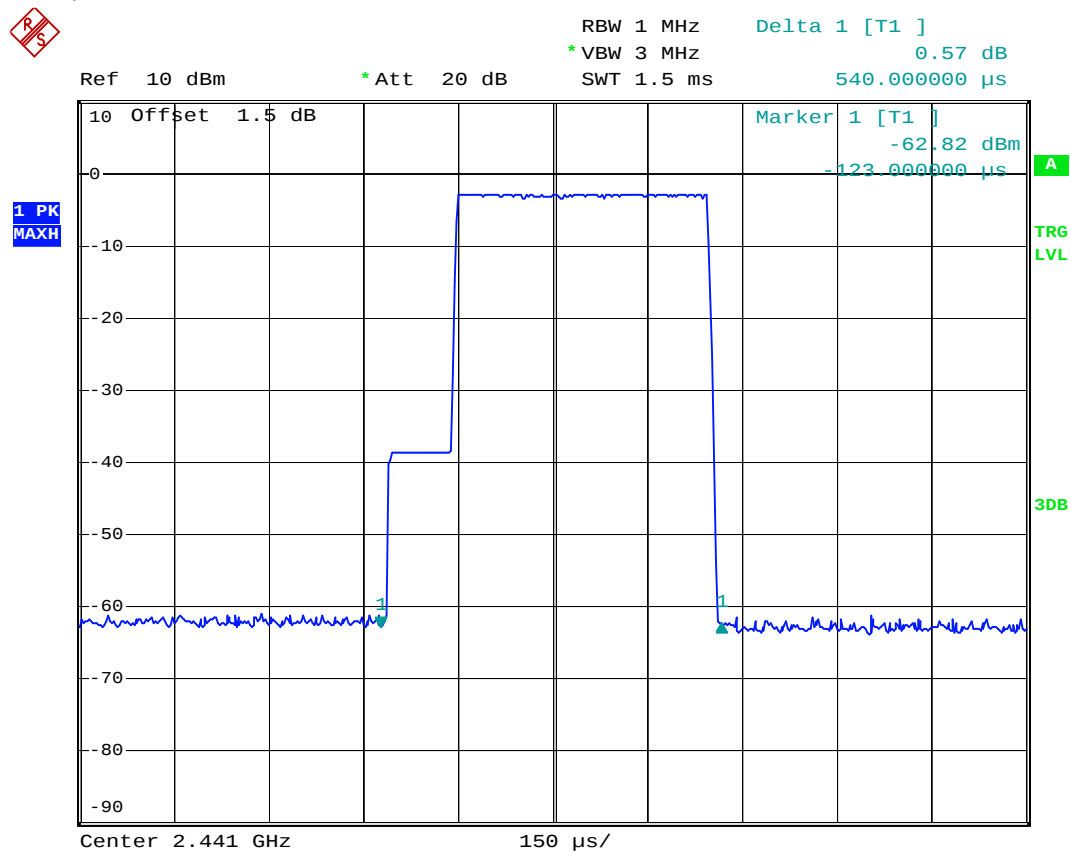
Channel	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
Low	2402	3.073	327.7867	400
Middle	2441	3.097	330.3467	400
High	2480	3.081	328.6400	400

The spectrum analyzer plots are attached as below.

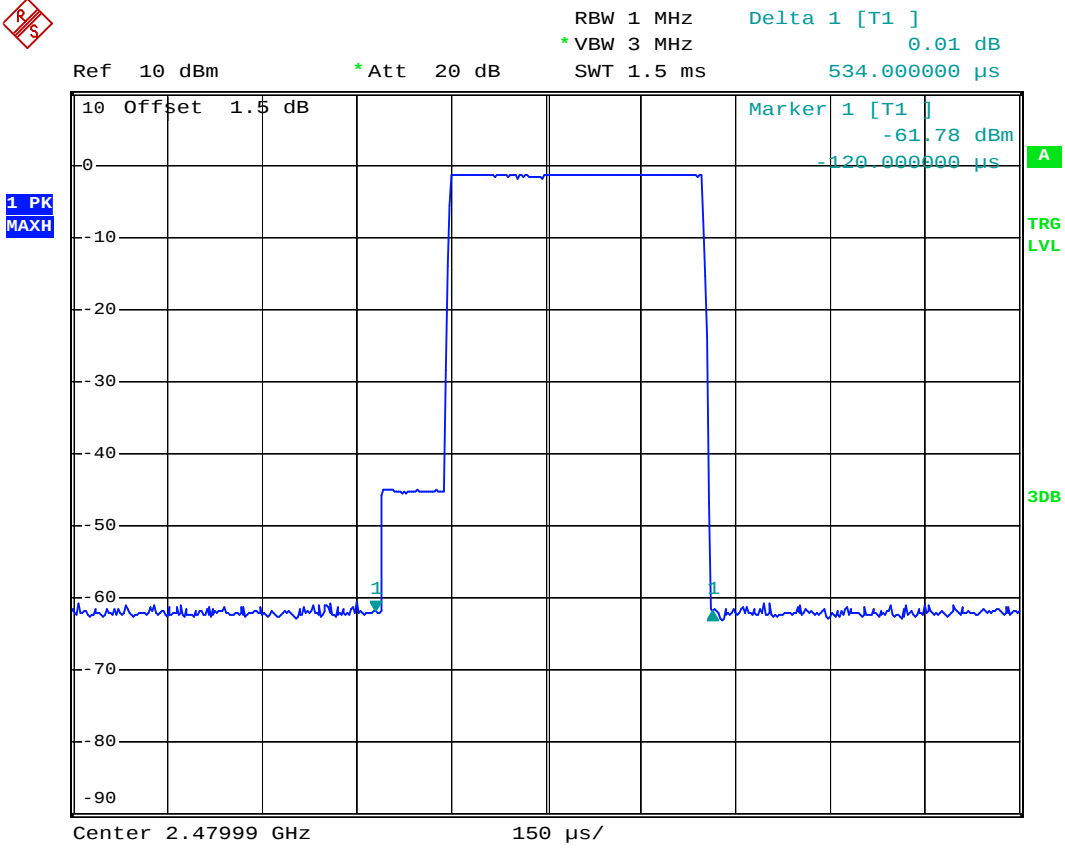
DH1:



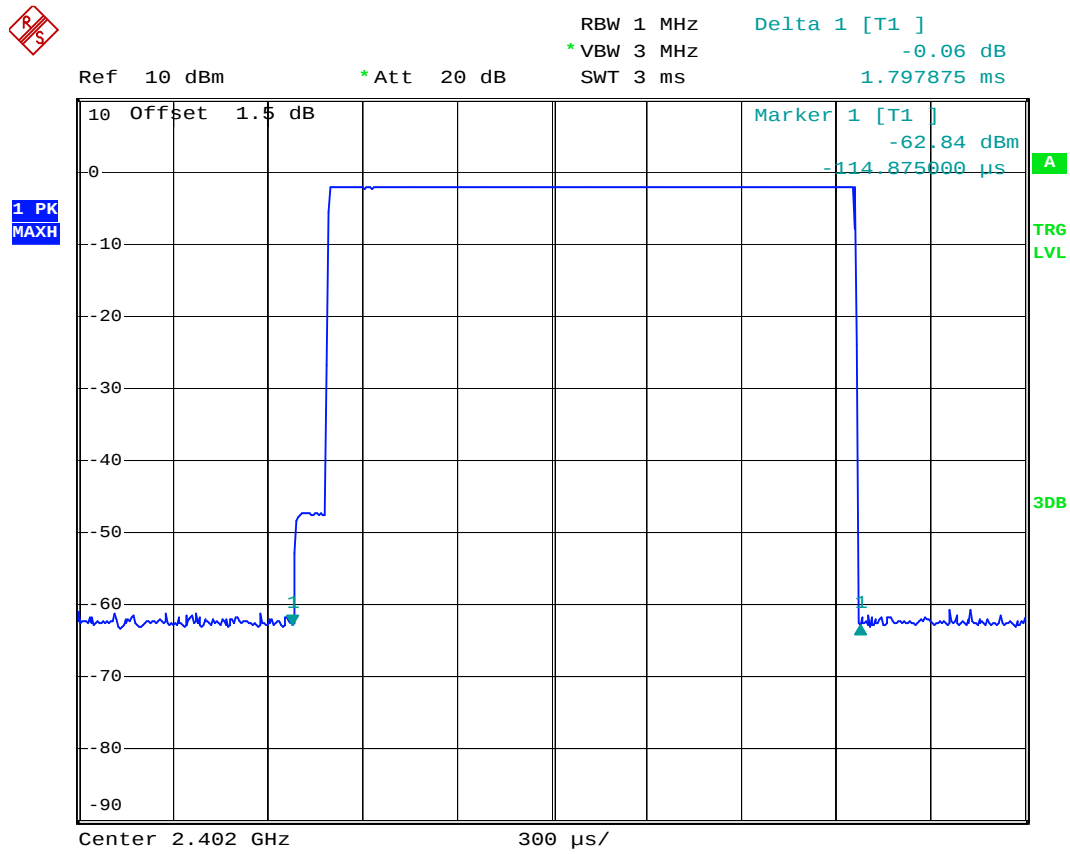
DH1:



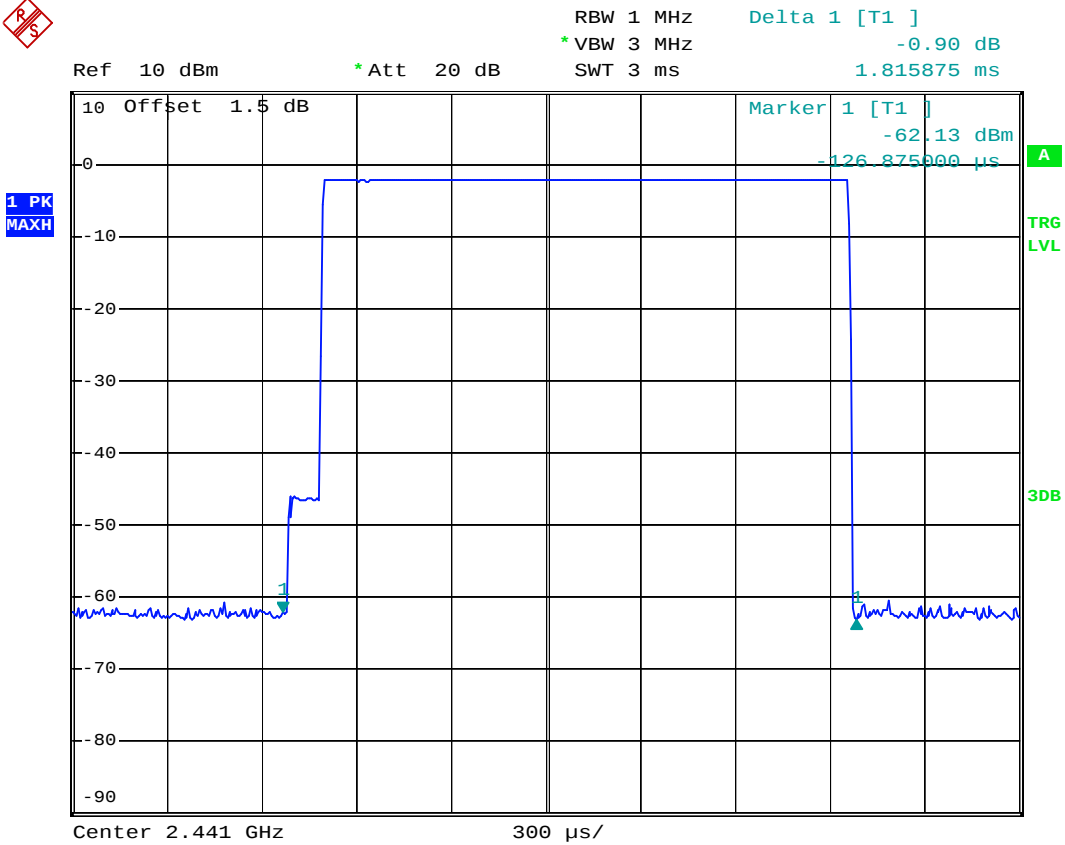
DH1:



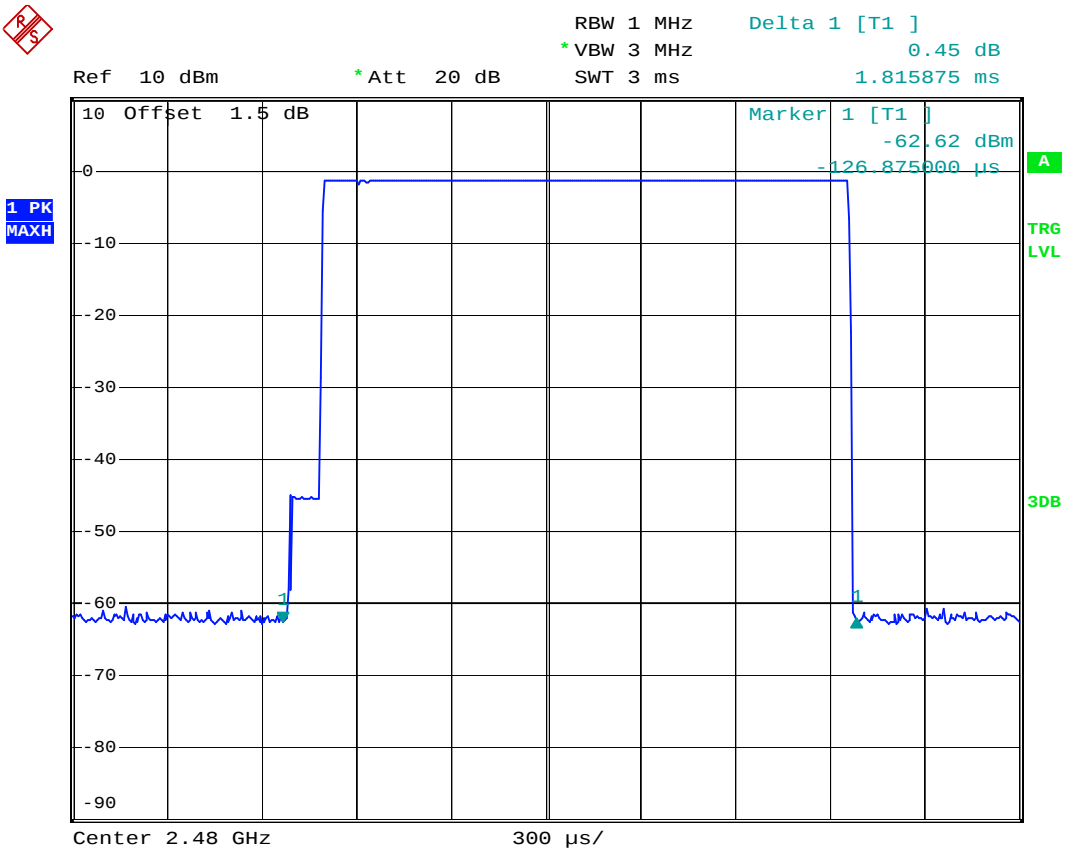
DH3:



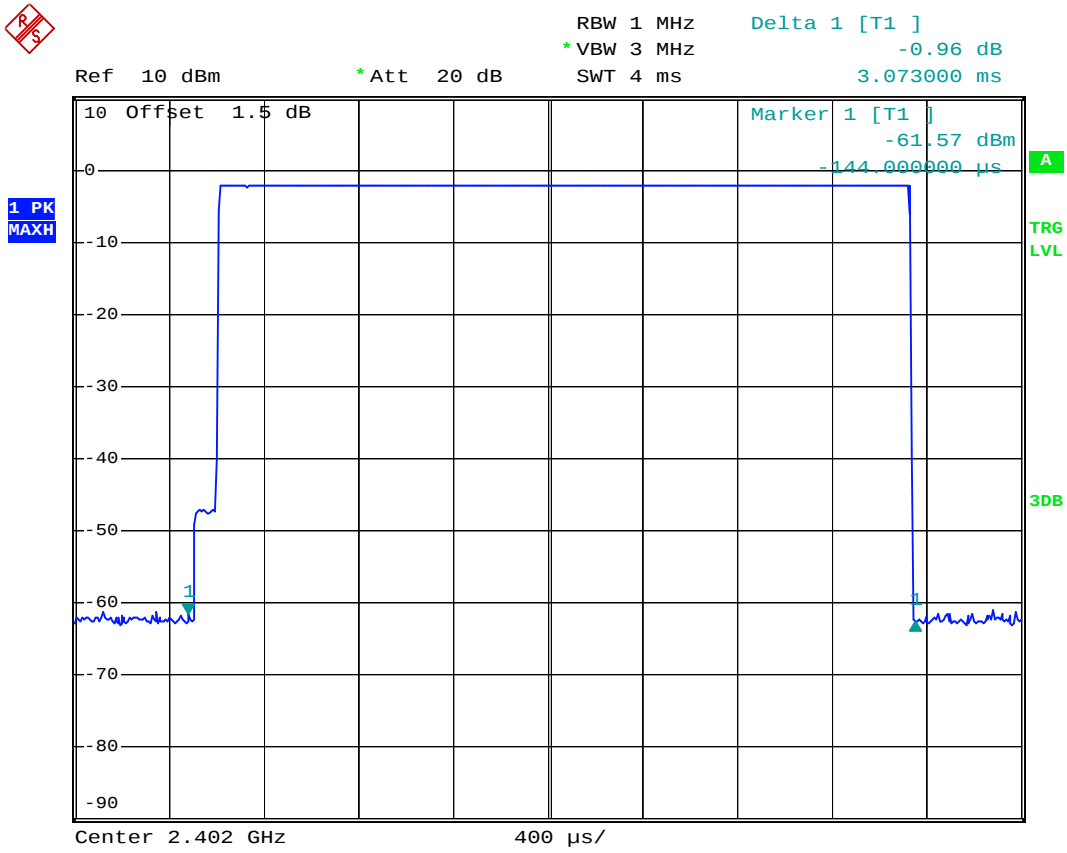
DH3:



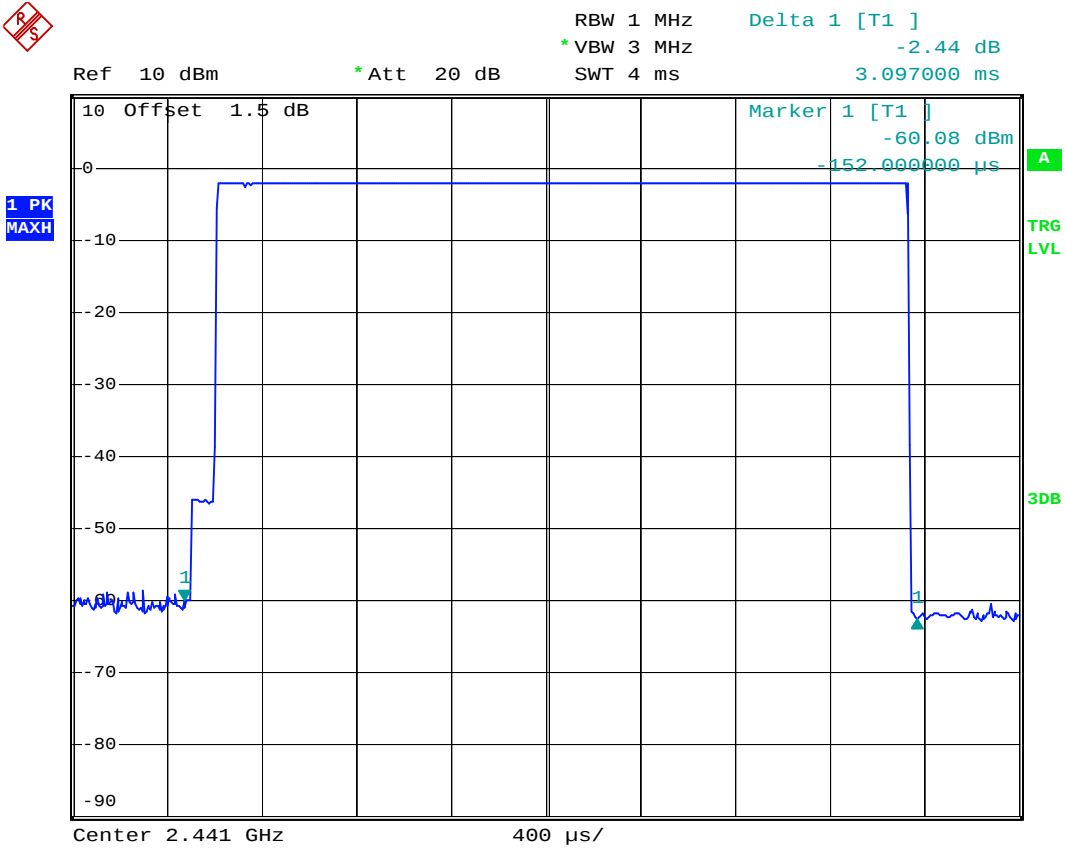
DH3:



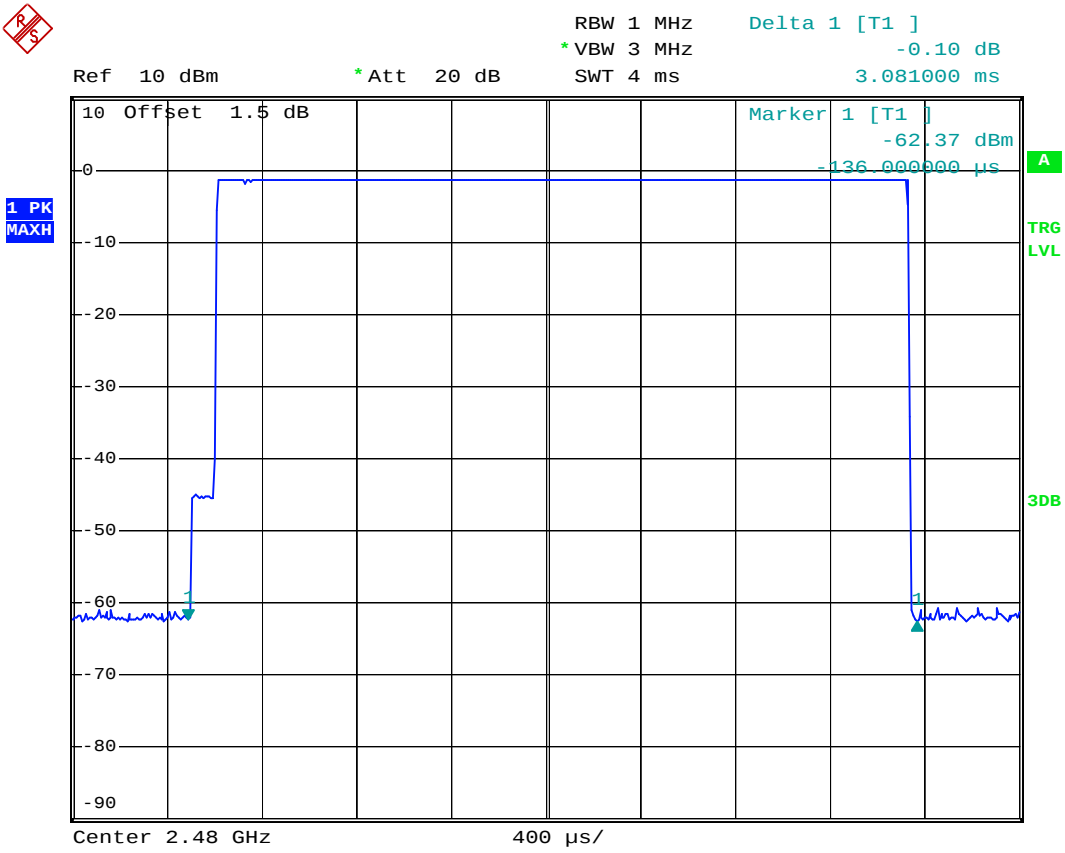
DH5:



DH5:

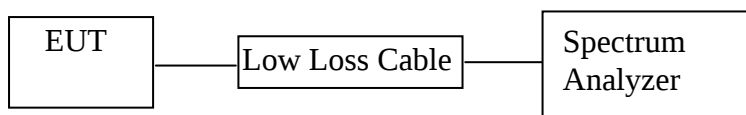


DH5:



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

9.2. The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): 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.

9.3. EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number	: CQZ501-B
Serial Number	: N/A
Manufacturer	: Sure Wave (HongKong) Limited

9.4. Operating Condition of EUT

9.4.1. Setup the EUT and simulator as shown as Section 9.1.

9.4.2. Turn on the power of all equipment.

9.4.3. Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5. Test Procedure

9.5.1. The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.

9.5.3. Measurement the maximum peak output power.

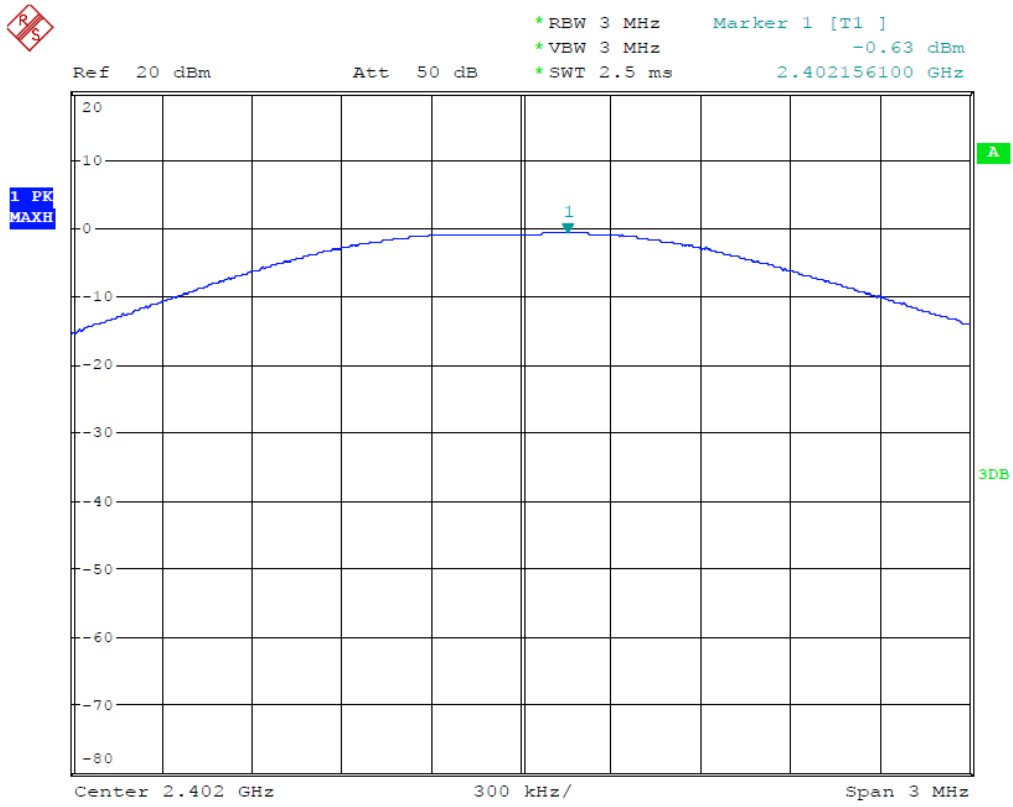
9.6. Test Result

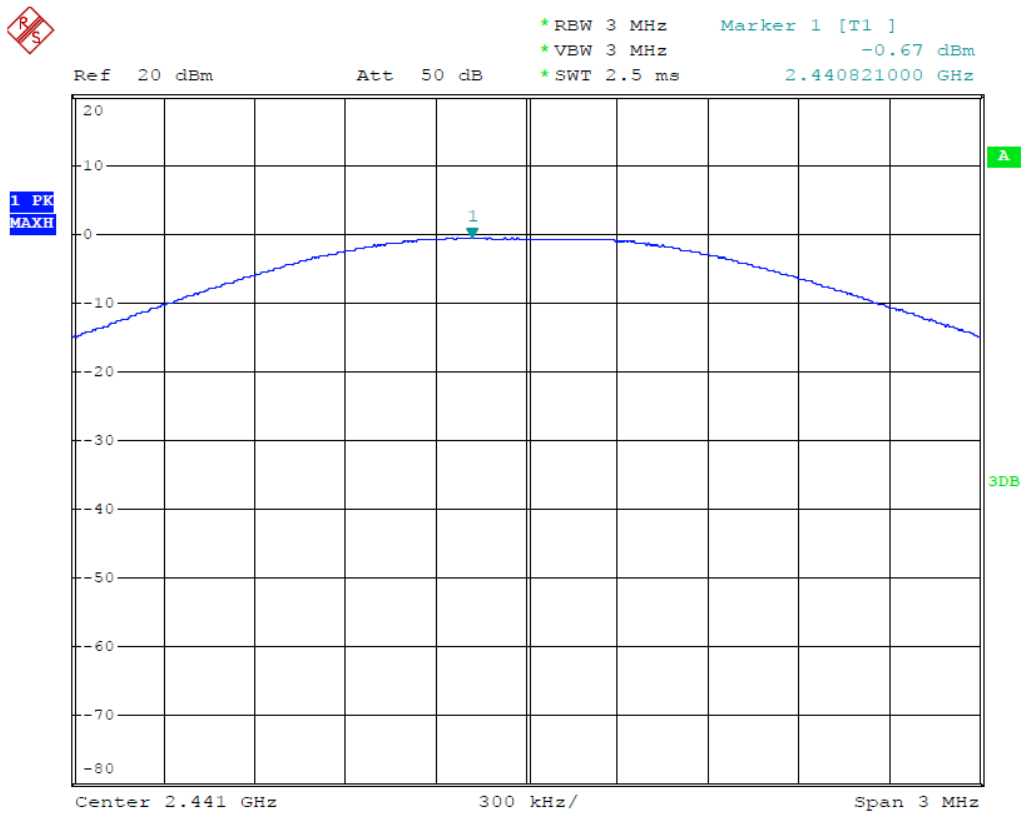
PASS.

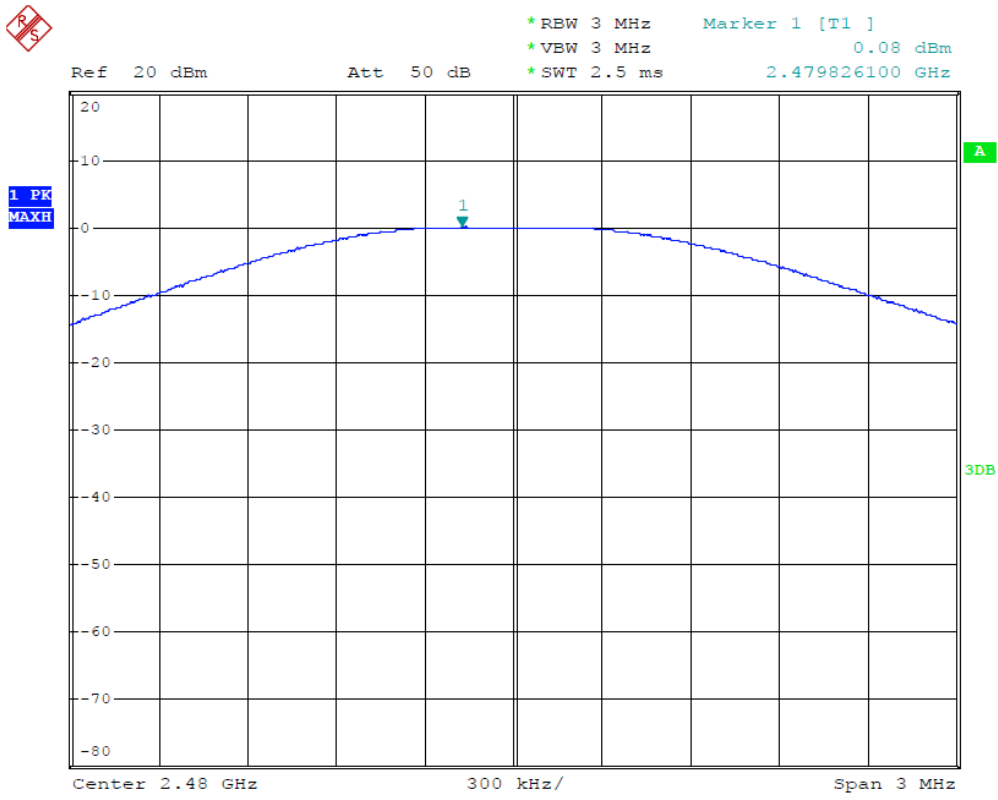
Date of Test:	<u>December 24, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX</u>	Test Engineer:	<u>Rickey</u>

Channel	Frequency (MHz)	Peak Output Power (dBm)	Peak Output Power (mW)	Limits dBm / mW
Low	2402	-0.63	0.86	21 dBm / 125 mW
Middle	2441	-0.67	0.85	21 dBm / 125 mW
High	2480	0.08	1.01	21 dBm / 125 mW

The spectrum analyzer plots are attached as below.



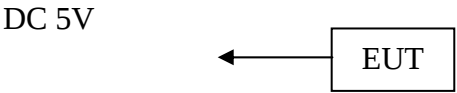




10.RADIATED EMISSION TEST

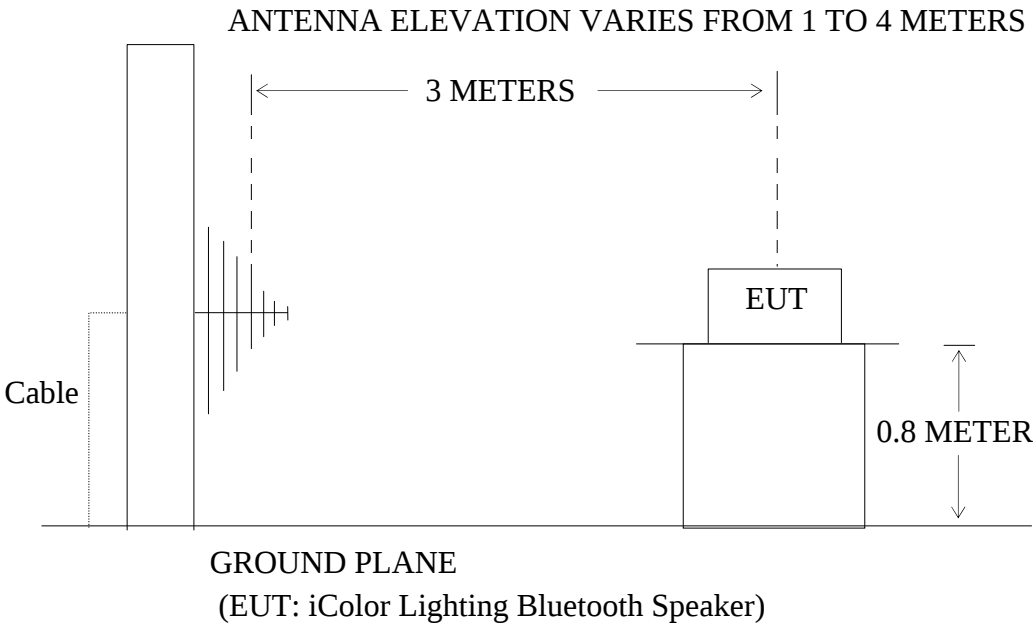
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and simulators



(EUT: iColor Lighting Bluetooth Speaker)

10.1.2.Anechoic Chamber Test Setup Diagram



10.2.The Limit For Section 15.247(d)

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

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 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
8.41425-8.41475	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	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.4.1.iColor Lighting Bluetooth Speaker (EUT)

Model Number : CQZ501-B
 Serial Number : N/A
 Manufacturer : Sure Wave (HongKong) Limited

10.5.est Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4- 2009 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120 KHz in 30-1000MHz. and set at 1MHz in above 1000MHz.

The frequency range from 30MHz to 25000MHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

10.6.The Field Strength of Radiation Emission Measurement Results

PASS.

Date of Test:	December 24, 2013	Temperature:	25°C
EUT:	iColor Lighting Bluetooth Speaker	Humidity:	50%
Model No.:	CQZ501-B	Power Supply:	DC 5V
Test Mode:	TX (2402MHz)	Test Engineer:	Rickey

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
34.2760	45.06	-19.26	-25.80	40.00	-14.20	Horizontal
57.1914	44.99	-21.00	-23.99	40.00	-16.01	Horizontal
207.8501	46.39	-20.03	26.36	43.50	-17.14	Horizontal
34.3964	49.81	-19.30	30.51	40.00	-9.49	Vertical
55.0274	50.78	-20.92	29.86	40.00	-10.14	Vertical
144.3348	53.62	-23.67	29.95	43.50	-13.55	Vertical

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

Note: 1. The emission emitted by the EUT is too low to be measured except the emission listed above.

2. *: Denotes restricted band of operation.

3. The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.

Date of Test:	December 24, 2013	Temperature:	25°C
EUT:	iColor Lighting Bluetooth Speaker	Humidity:	50%
Model No.:	CQZ501-B	Power Supply:	DC 5V
Test Mode:	TX (2441MHz)	Test Engineer:	Rickey

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
34.3963	45.79	-19.30	26.49	40.00	-13.51	Horizontal
54.5348	45.48	-20.91	24.57	40.00	-15.43	Horizontal
207.8500	45.58	-20.03	25.55	43.50	-17.95	Horizontal
34.3964	49.06	-19.30	29.76	40.00	-10.24	Vertical
55.2207	51.28	-20.92	30.36	40.00	-9.64	Vertical
141.8262	52.23	-23.56	28.67	43.50	-14.83	Vertical

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

Note: 1. The emission emitted by the EUT is too low to be measured except the emission listed above.**2. *: Denotes restricted band of operation.****3. The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.**

Date of Test:	December 24, 2013	Temperature:	25°C
EUT:	iColor Lighting Bluetooth Speaker	Humidity:	50%
Model No.:	CQZ501-B	Power Supply:	DC 5V
Test Mode:	TX (2480MHz)	Test Engineer:	Rickey

For 30MHz-1000MHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading (dBμV/m)	Factor Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
	QP		QP	QP	QP	
34.3964	45.53	-19.30	26.23	40.00	-13.77	Horizontal
55.0274	47.07	-20.92	26.15	40.00	-13.85	Horizontal
167.8243	48.22	-22.02	26.20	43.50	-17.30	Horizontal
34.2760	49.36	-19.26	30.10	40.00	-9.90	Vertical
55.2207	50.69	-20.92	29.77	40.00	-10.23	Vertical
142.8243	52.67	-23.60	29.07	43.50	-14.43	Vertical

For 1GHz-25GHz

Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

Frequency (MHz)	Reading(dBμV/m)		Factor Corr. (dB)	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
-	-	-	-	-	-	-	-	-	-	Vertical
-	-	-	-	-	-	-	-	-	-	Horizontal

Note: 1. The emission emitted by the EUT is too low to be measured except the emission listed above.**2. *: Denotes restricted band of operation.****3. The fundamental radiated emissions were reduced by 2.4G Band Reject Filter in the attached plots.**



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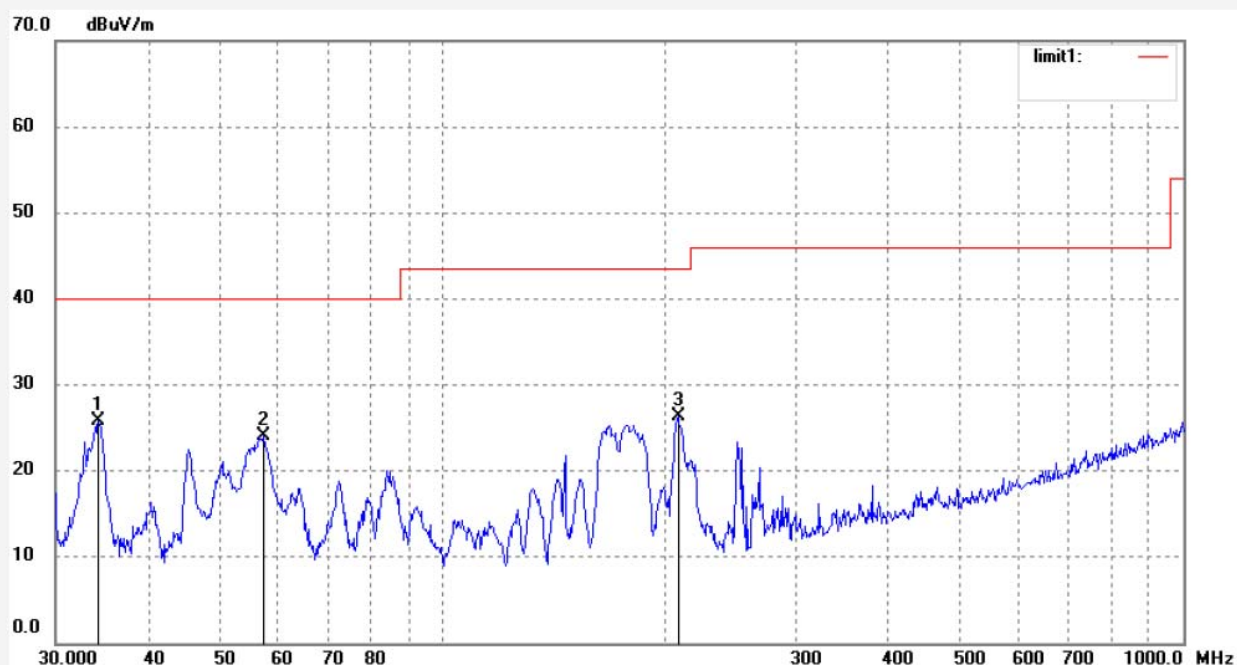
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4257
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2402MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Horizontal
Power Source: DC 5V
Date: 13/12/24/
Time: 13/57/58
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.2760	45.06	-19.26	25.80	40.00	-14.20	peak			
2	57.1914	44.99	-21.00	23.99	40.00	-16.01	peak			
3	207.8501	46.39	-20.03	26.36	43.50	-17.14	peak			



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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4258

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2402MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Vertical

Power Source: DC 5V

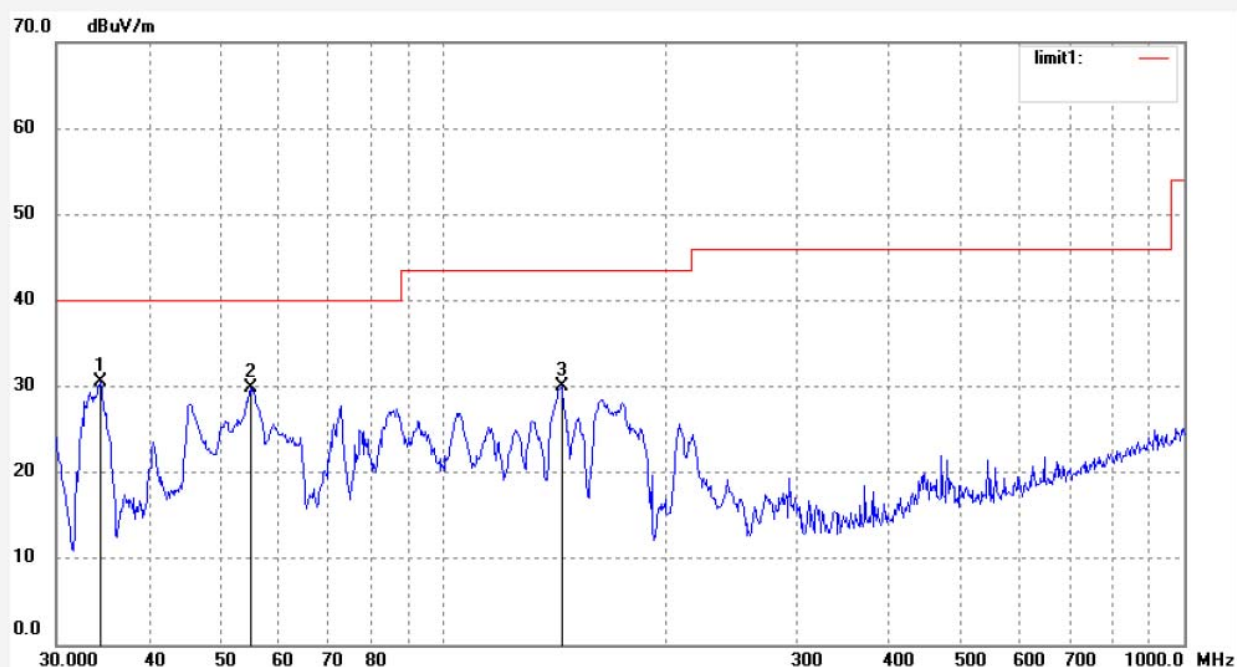
Date: 13/12/24/

Time: 13/58/46

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3964	49.81	-19.30	30.51	40.00	-9.49	peak			
2	55.0274	50.78	-20.92	29.86	40.00	-10.14	peak			
3	144.3348	53.62	-23.67	29.95	43.50	-13.55	peak			



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star #4267

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2402MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Vertical

Power Source: DC 5V

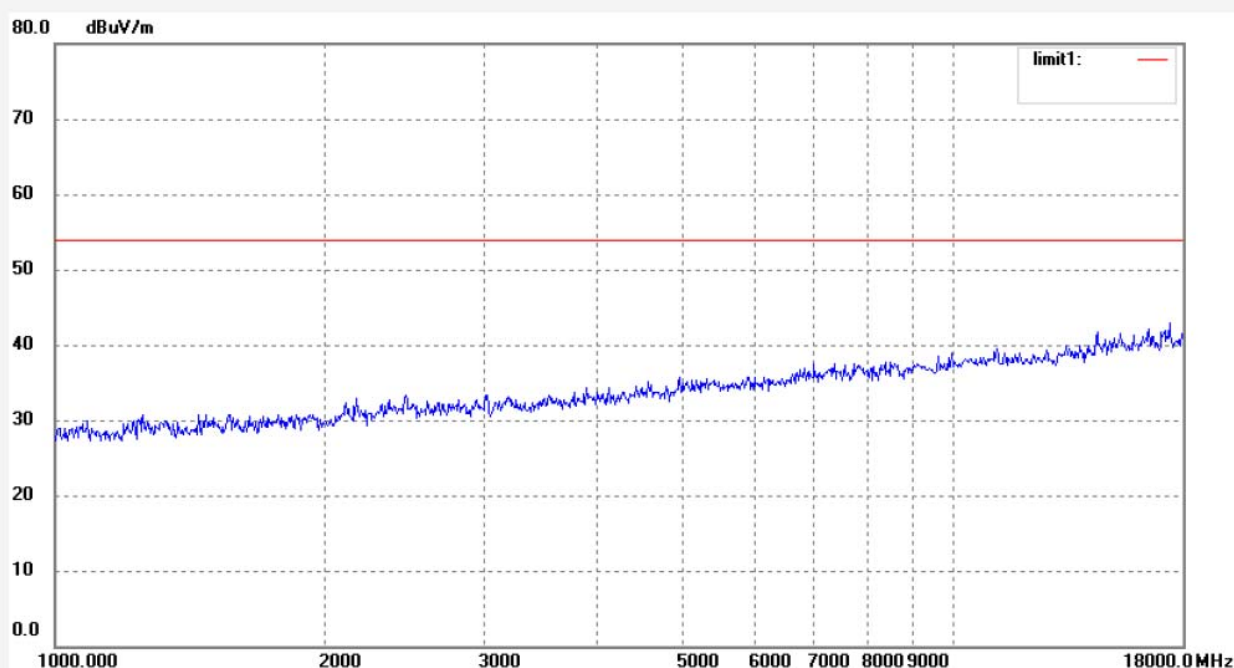
Date: 13/12/24/

Time: 14/11/47

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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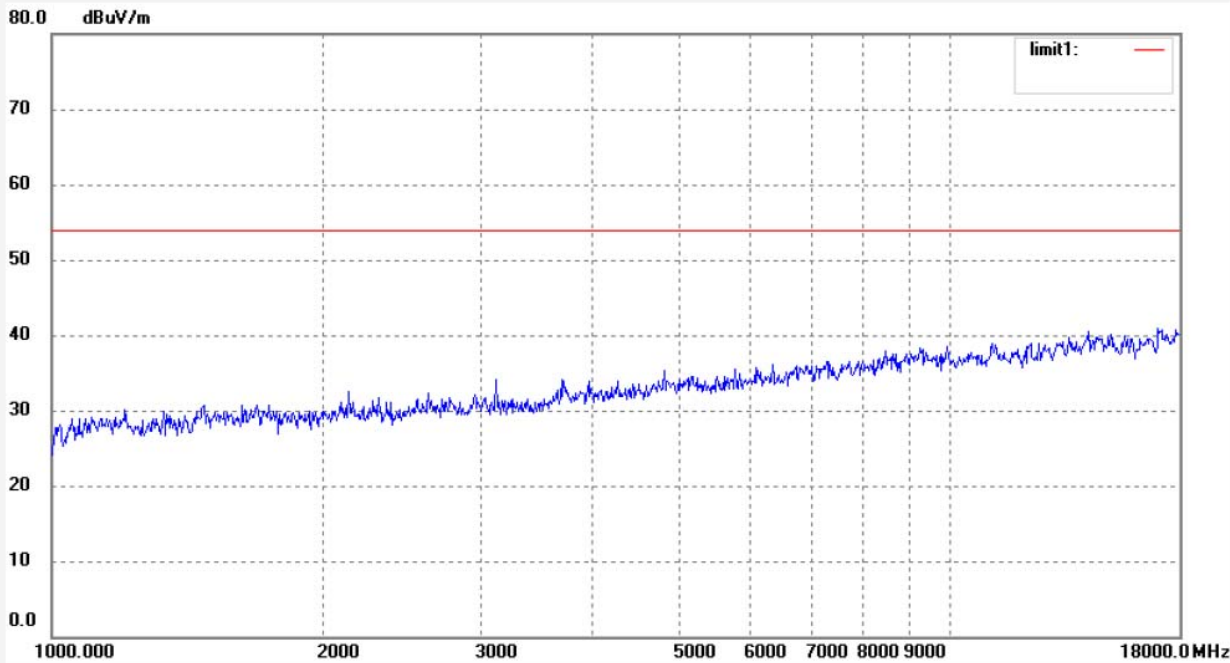
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4268
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2402MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Horizontal
Power Source: DC 5V
Date: 13/12/24/
Time: 14/12/43
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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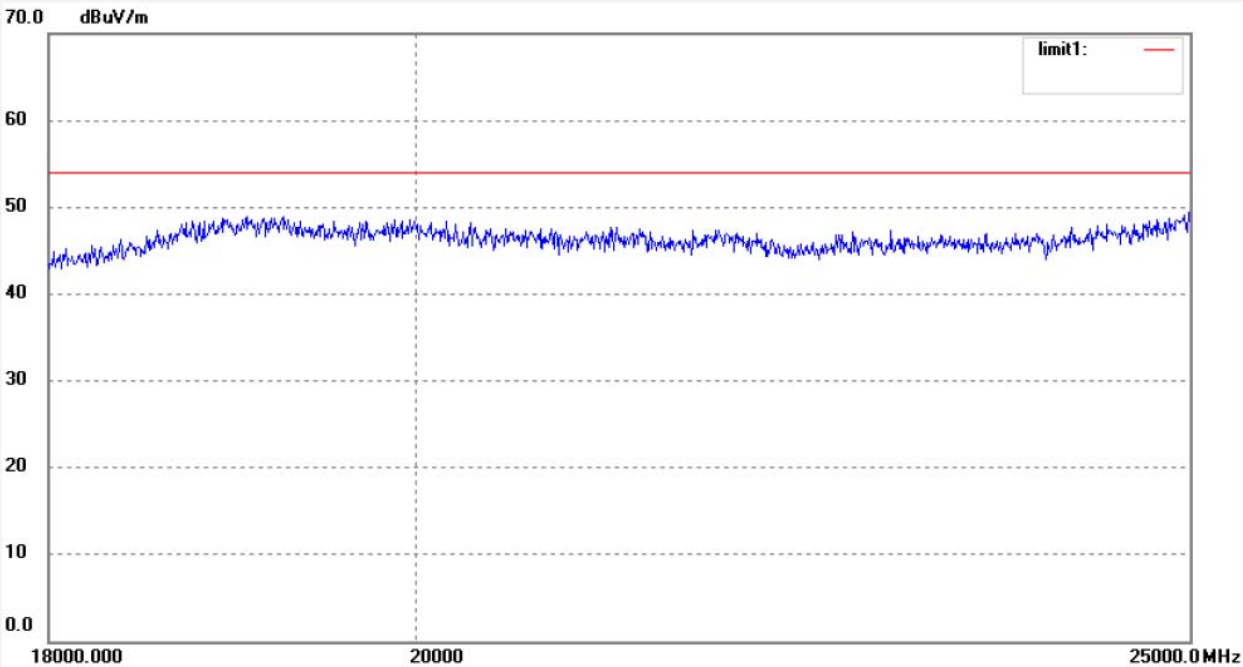


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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Alen #651	Polarization: Vertical
Standard: FCC 15C	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 11:41:05
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature: Alen
Mode: TX 2402MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	
Note: Report No:ATE20132710	



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
-----	----------------	---------------------	----------------	--------------------	-------------------	----------------	----------	----------------	------------------	--------



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Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Alen #652

Standard: FCC 15C

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 50 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2402MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Horizontal

Power Source: DC 5V

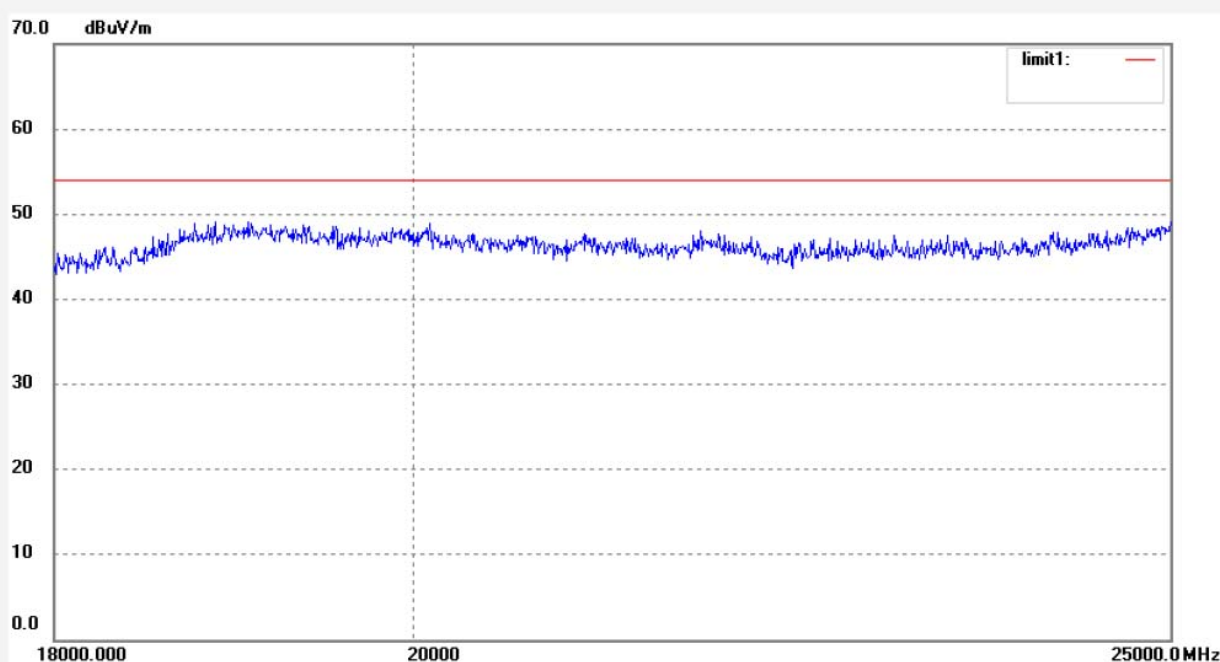
Date: 13/12/24/

Time: 11:42:56

Engineer Signature: Alen

Distance: 3m

Note: Report No:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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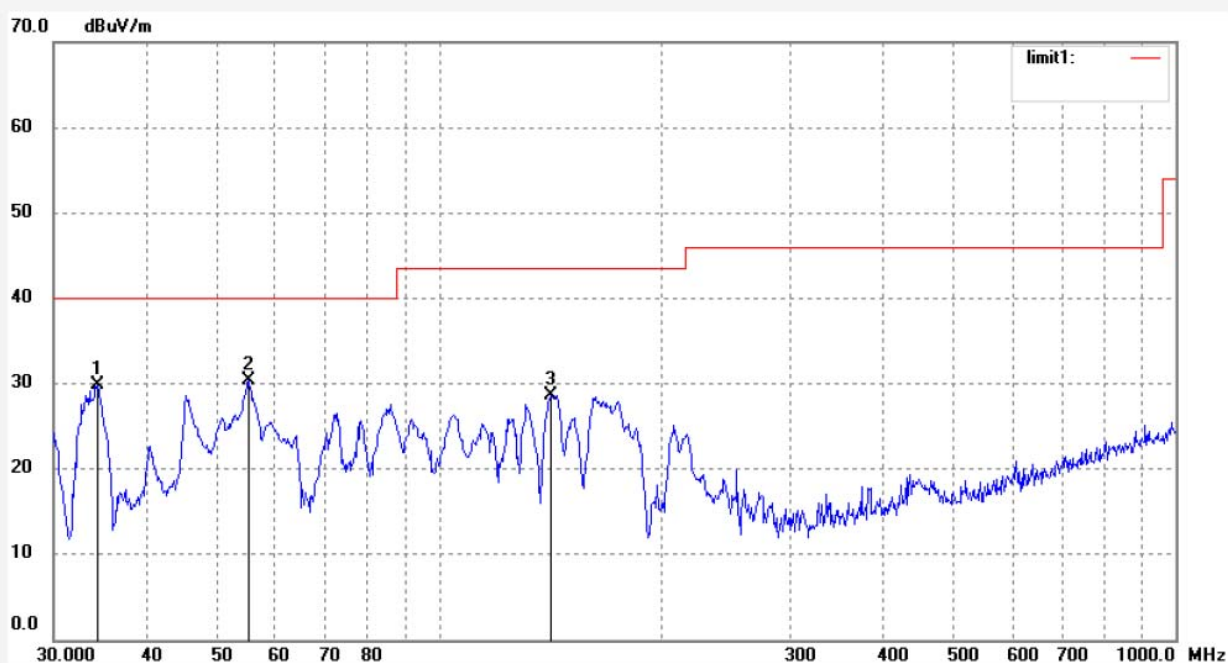
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4259
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2441MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Vertical
Power Source: DC 5V
Date: 13/12/24/
Time: 13/59/29
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3964	49.06	-19.30	29.76	40.00	-10.24	peak			
2	55.2207	51.28	-20.92	30.36	40.00	-9.64	peak			
3	141.8262	52.23	-23.56	28.67	43.50	-14.83	peak			



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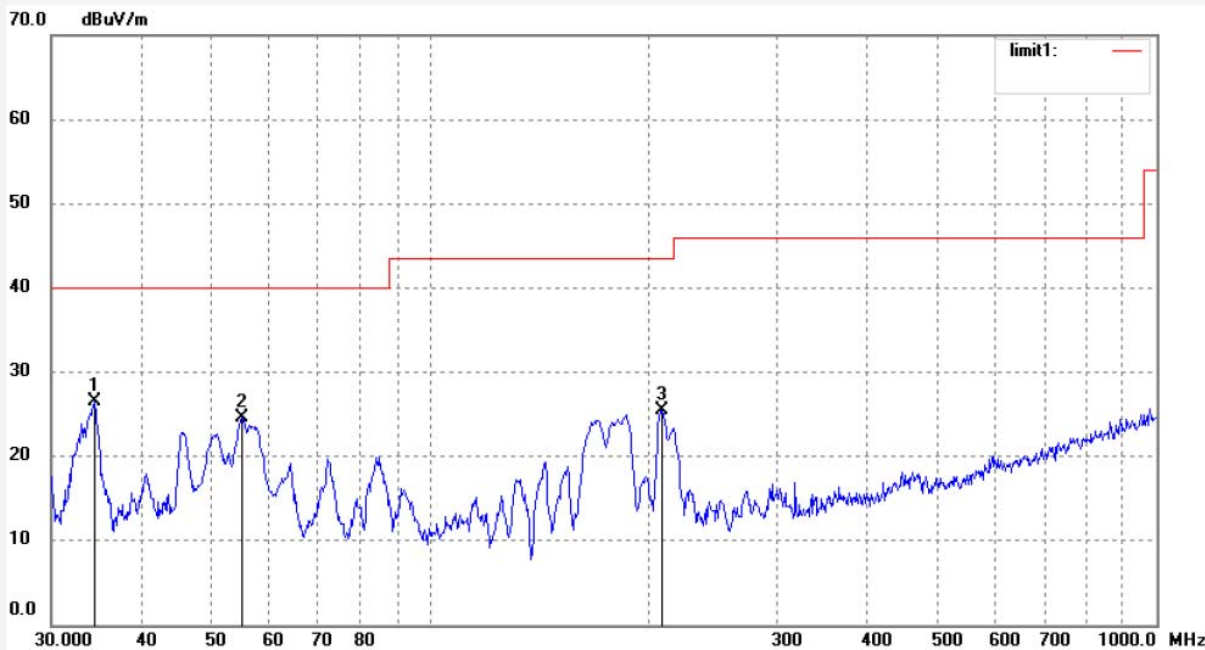
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4260
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2441MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Horizontal
Power Source: DC 5V
Date: 13/12/24/
Time: 14/00/46
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3963	45.79	-19.30	26.49	40.00	-13.51	peak			
2	54.8348	45.48	-20.91	24.57	40.00	-15.43	peak			
3	207.8500	45.58	-20.03	25.55	43.50	-17.95	peak			



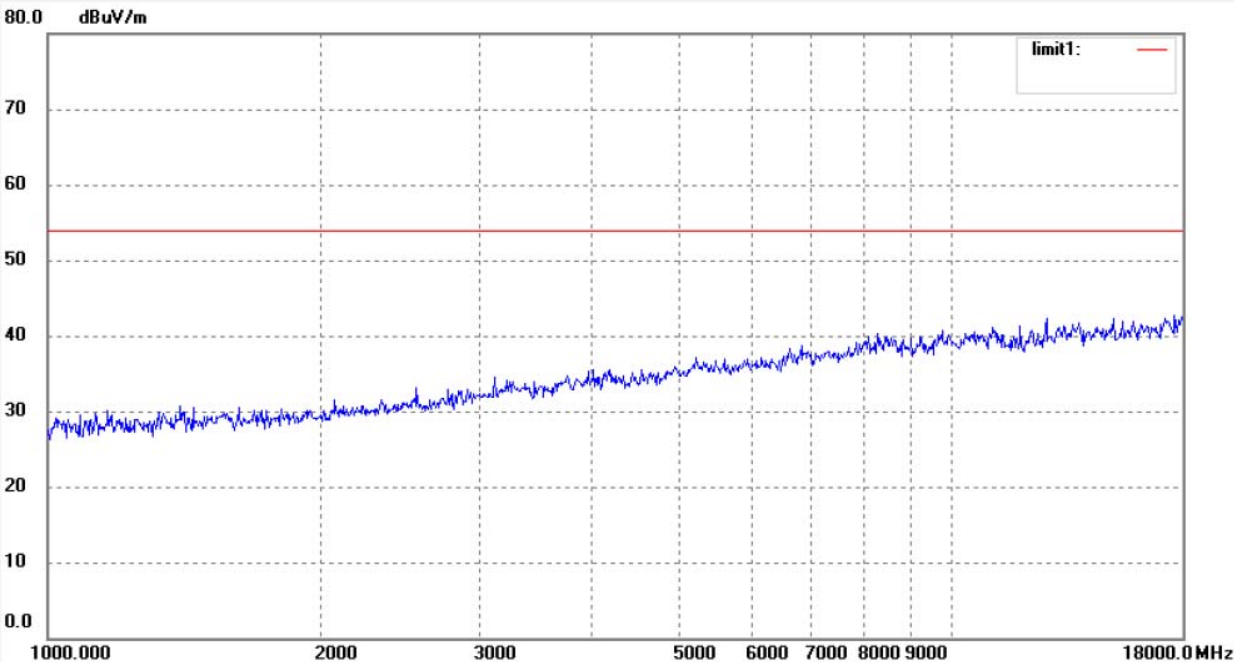
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4265	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/08/45
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature:
Mode: TX 2441MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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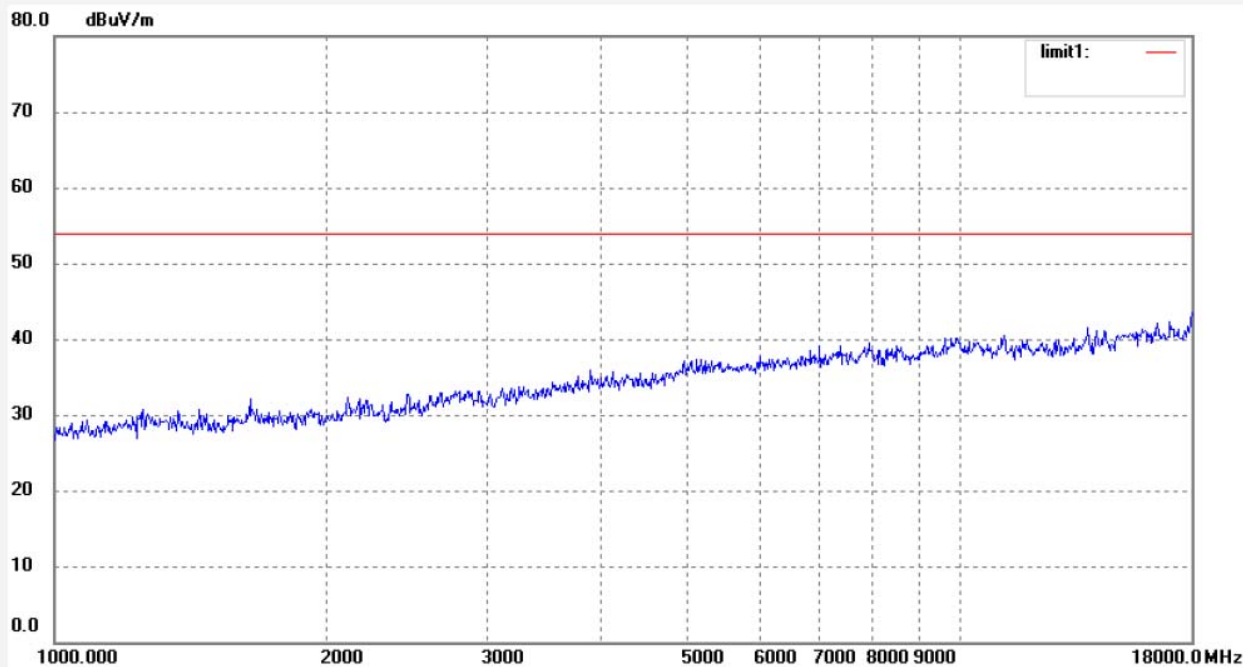
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4266	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/10/44
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature:
Mode: TX 2441MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
-----	----------------	---------------------	----------------	--------------------	-------------------	----------------	----------	----------------	------------------	--------



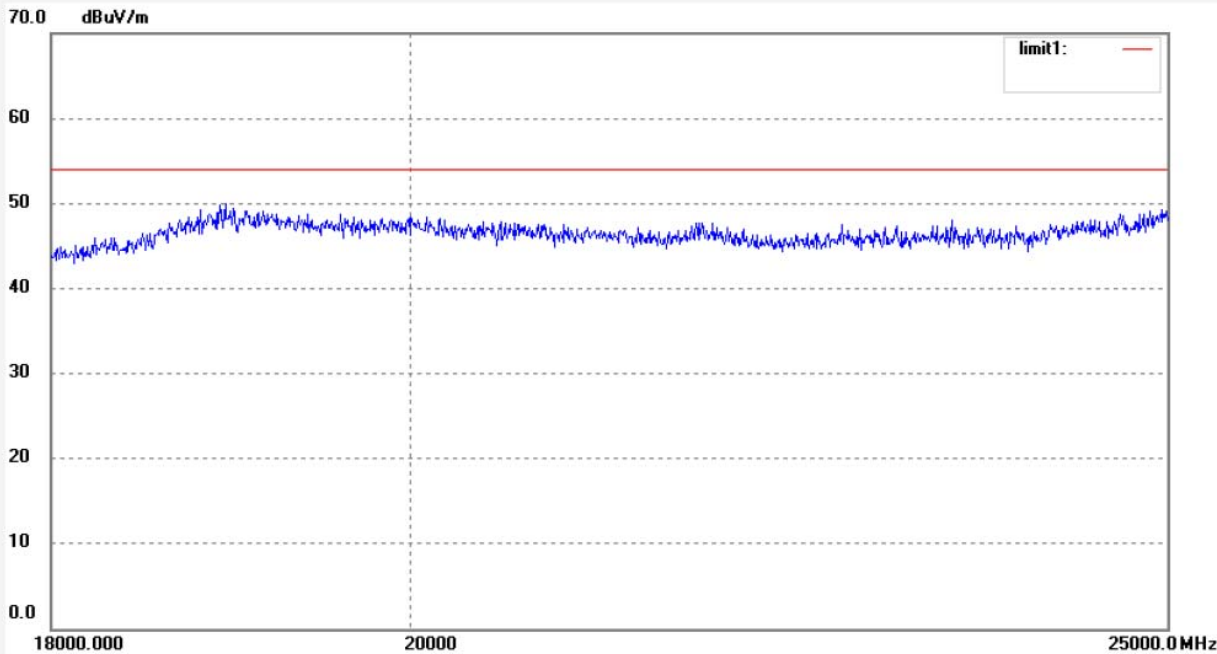
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Alen #653	Polarization: Horizontal
Standard: FCC 15C	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 11:44:38
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature: Alen
Mode: TX 2441MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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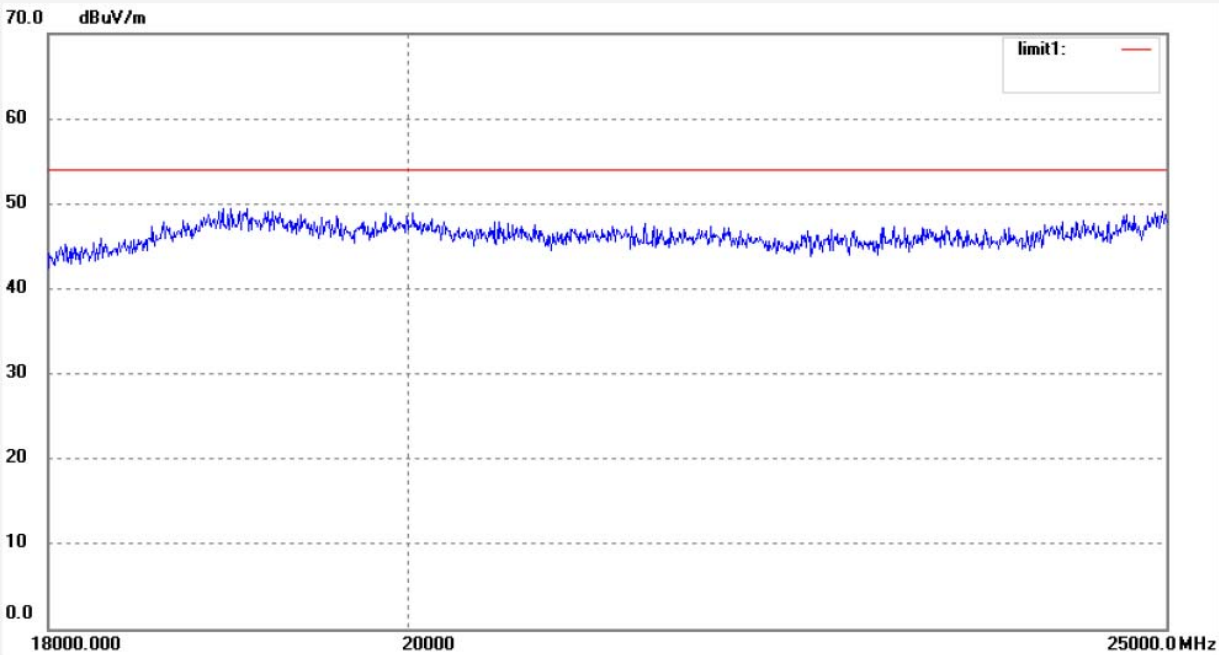
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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Alen #654	Polarization: Vertical
Standard: FCC 15C	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 11:45:42
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature: Alen
Mode: TX 2441MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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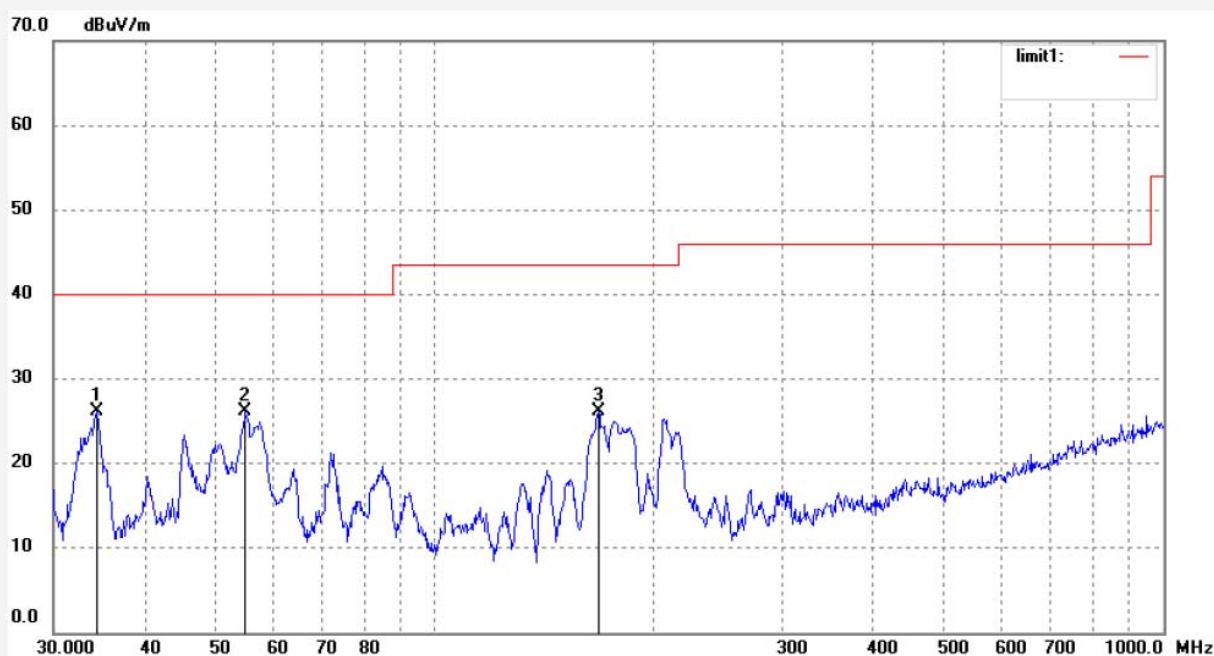
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4261
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2480MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Horizontal
Power Source: DC 5V
Date: 13/12/24/
Time: 14/02/10
Engineer Signature:
Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.3964	45.53	-19.30	26.23	40.00	-13.77	peak			
2	55.0274	47.07	-20.92	26.15	40.00	-13.85	peak			
3	167.8243	48.22	-22.02	26.20	43.50	-17.30	peak			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star #4262

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2480MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Vertical

Power Source: DC 5V

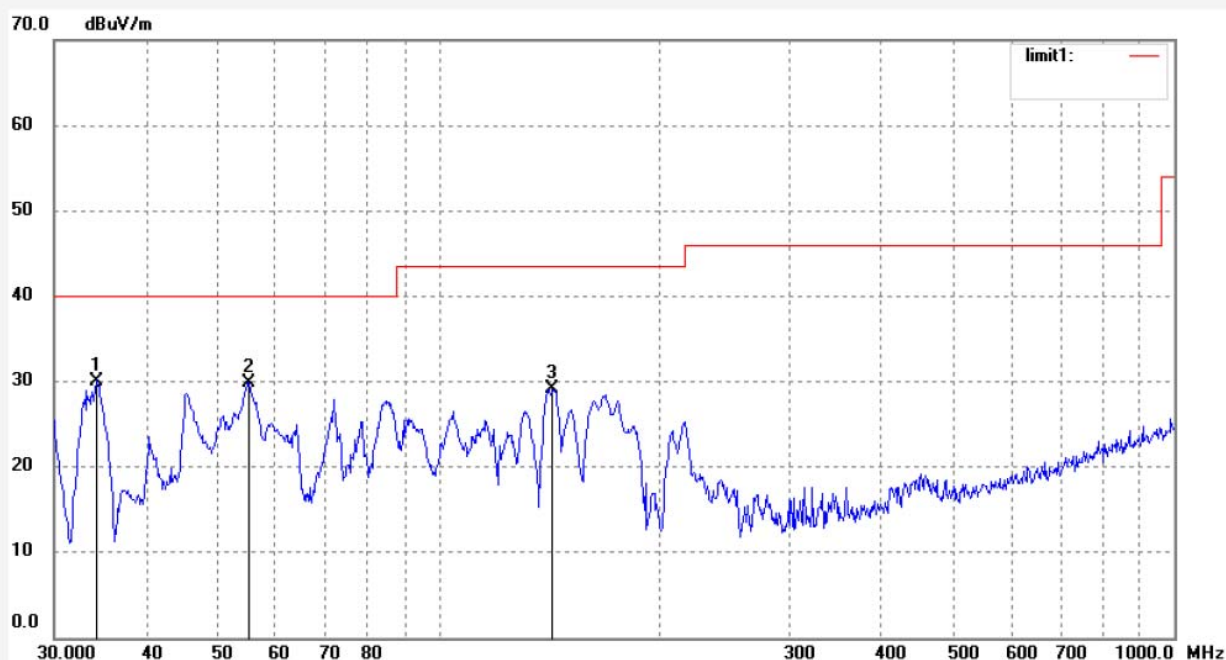
Date: 13/12/24/

Time: 14/03/00

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.2760	49.36	-19.26	30.10	40.00	-9.90	peak			
2	55.2207	50.69	-20.92	29.77	40.00	-10.23	peak			
3	142.8243	52.67	-23.60	29.07	43.50	-14.43	peak			



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: star #4263

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2480MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Vertical

Power Source: DC 5V

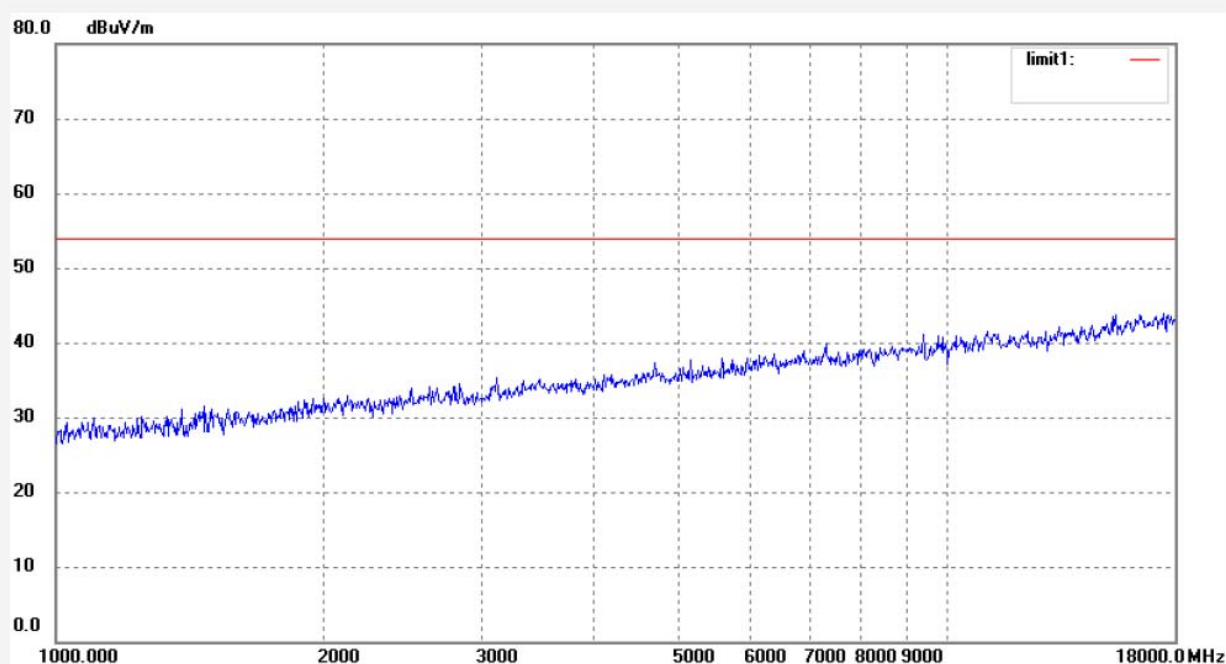
Date: 13/12/24/

Time: 14/05/08

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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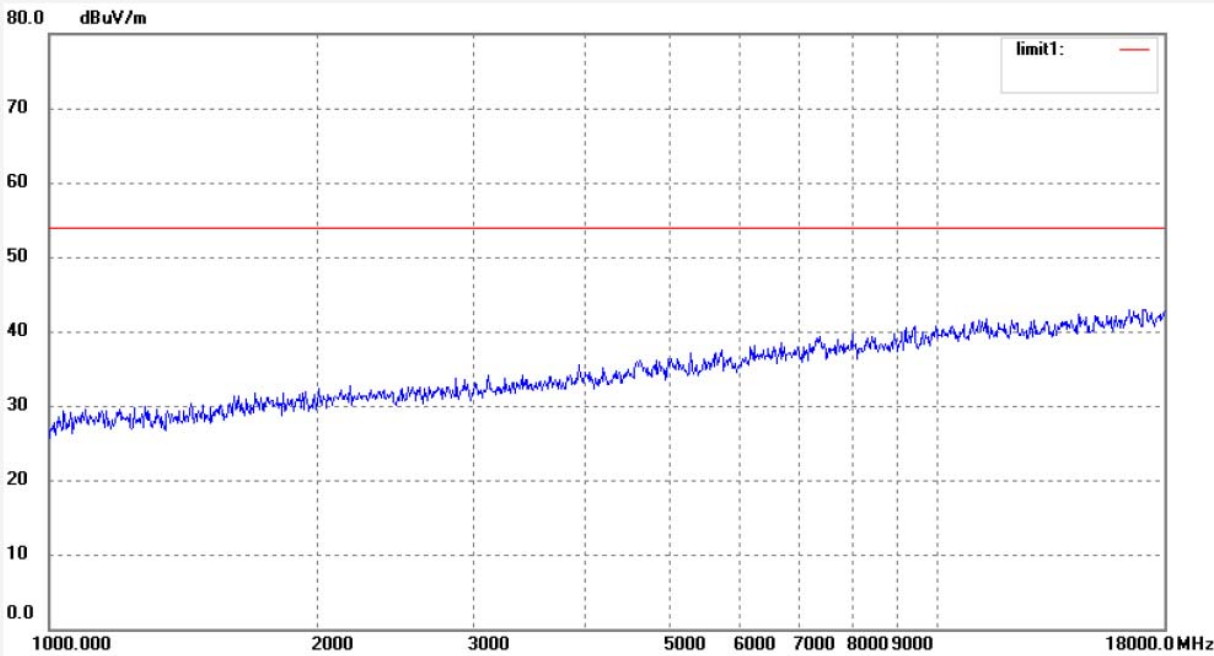
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F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star #4264	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/06/04
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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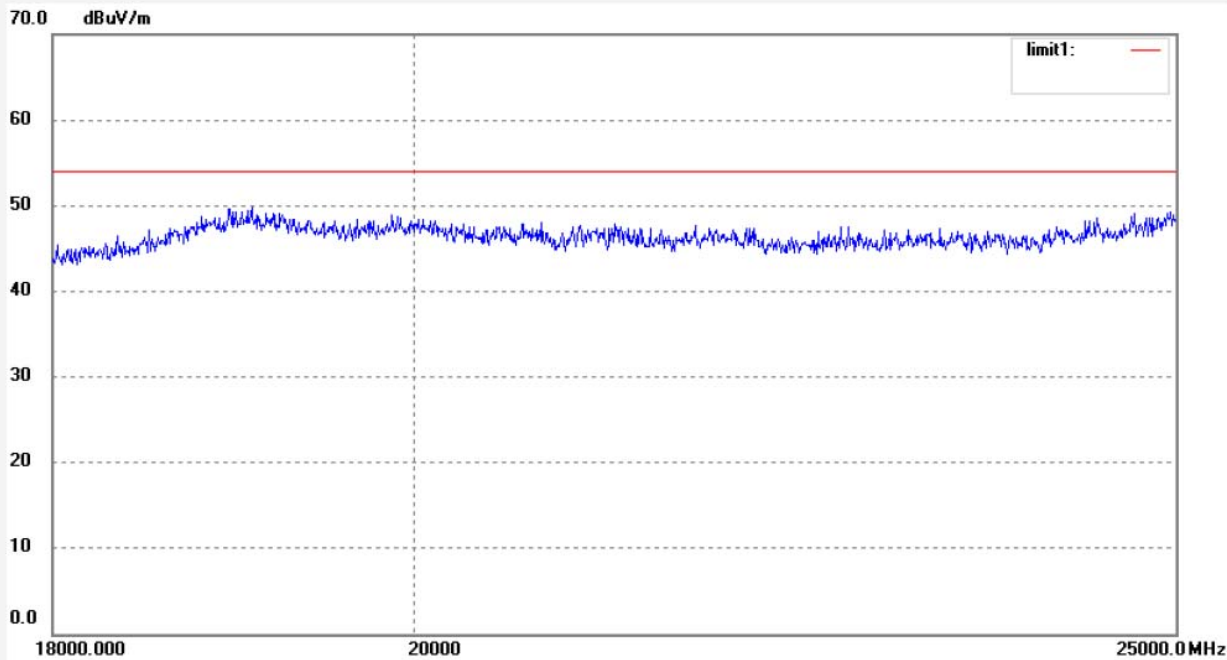
ACCURATE TECHNOLOGY CO., LTD.

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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Alen #655	Polarization: Vertical
Standard: FCC 15C	Power Source: DC 5V
Test item: Radiation Test	Date: 13/12/24/
Temp.(C)/Hum.(%) 25 C / 50 %	Time: 11:48:59
EUT: iColor Lighting Bluetooth Speaker	Engineer Signature: Alen
Mode: TX 2480MHz	Distance: 3m
Model: CQZ501-B	
Manufacturer: Sure Wave	

Note: Report No:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
-----	----------------	---------------------	----------------	--------------------	-------------------	----------------	----------	----------------	------------------	--------


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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 966 chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Alen #656

Standard: FCC 15C

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 50 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2480MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Horizontal

Power Source: DC 5V

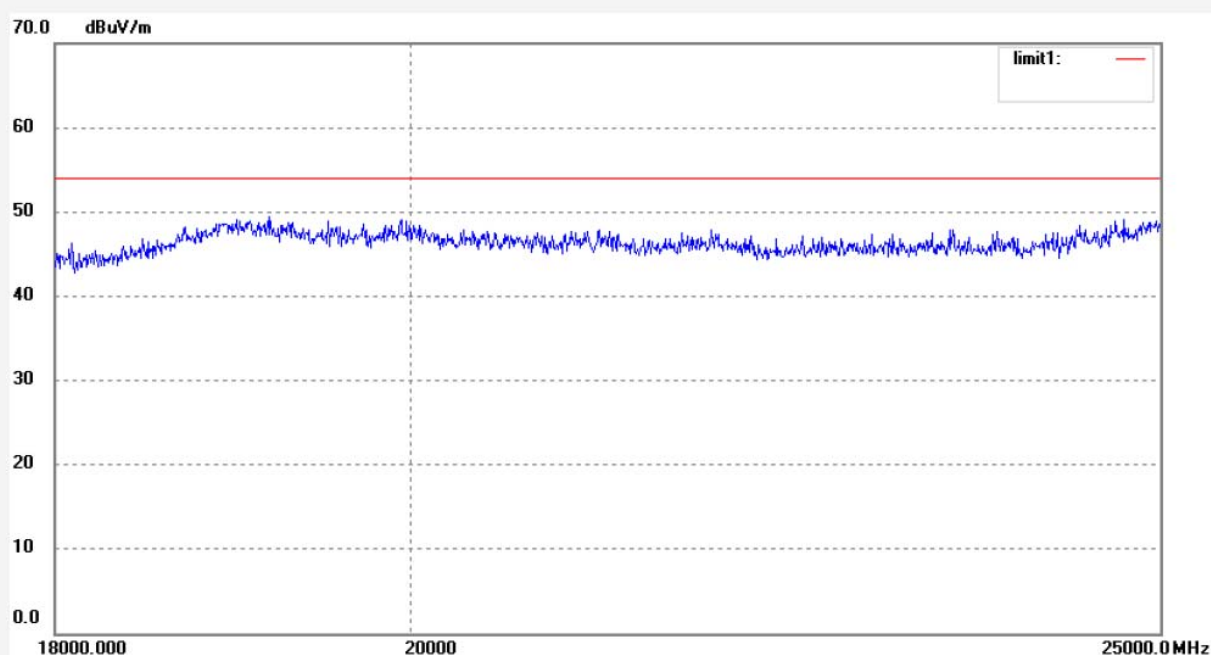
Date: 13/12/24/

Time: 11:52:35

Engineer Signature: Alen

Distance: 3m

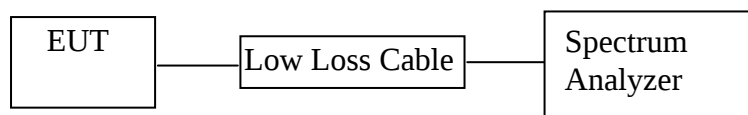
Note: Report No:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
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11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: iColor Lighting Bluetooth Speaker)

11.2.The Requirement For Section 15.247(d)

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

11.3.EUT Configuration on Measurement

The following equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.3.1.iColor Lighting Bluetooth Speaker (EUT)

Model Number	:	CQZ501-B
Serial Number	:	N/A
Manufacturer	:	Sure Wave (HongKong) Limited

11.4. Operating Condition of EUT

11.4.1. Setup the EUT and simulator as shown as Section 10.1.

11.4.2. Turn on the power of all equipment.

11.4.3. Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5. Test Procedure

Conducted Band Edge:

11.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2. Set RBW of spectrum analyzer to 300kHz and VBW to 1MHz.

Radiate Band Edge:

11.5.3. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.

11.5.4. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

11.5.5. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

11.5.6. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

11.5.7. The band edges was measured and recorded.

11.6. Test Result

Pass

Date of Test:	<u>December 25, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX (Hopping off)</u>	Test Engineer:	<u>Rickey</u>

Conducted test

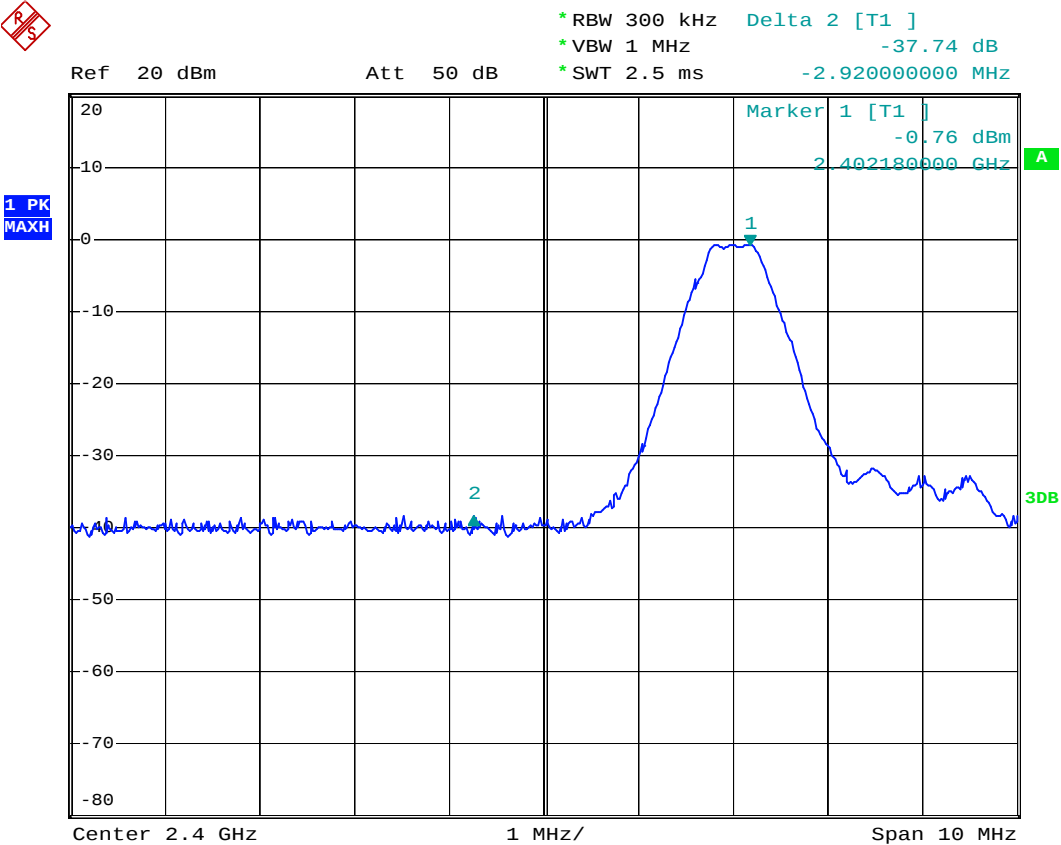
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2402	37.74	> 20dBc
2480	38.25	> 20dBc

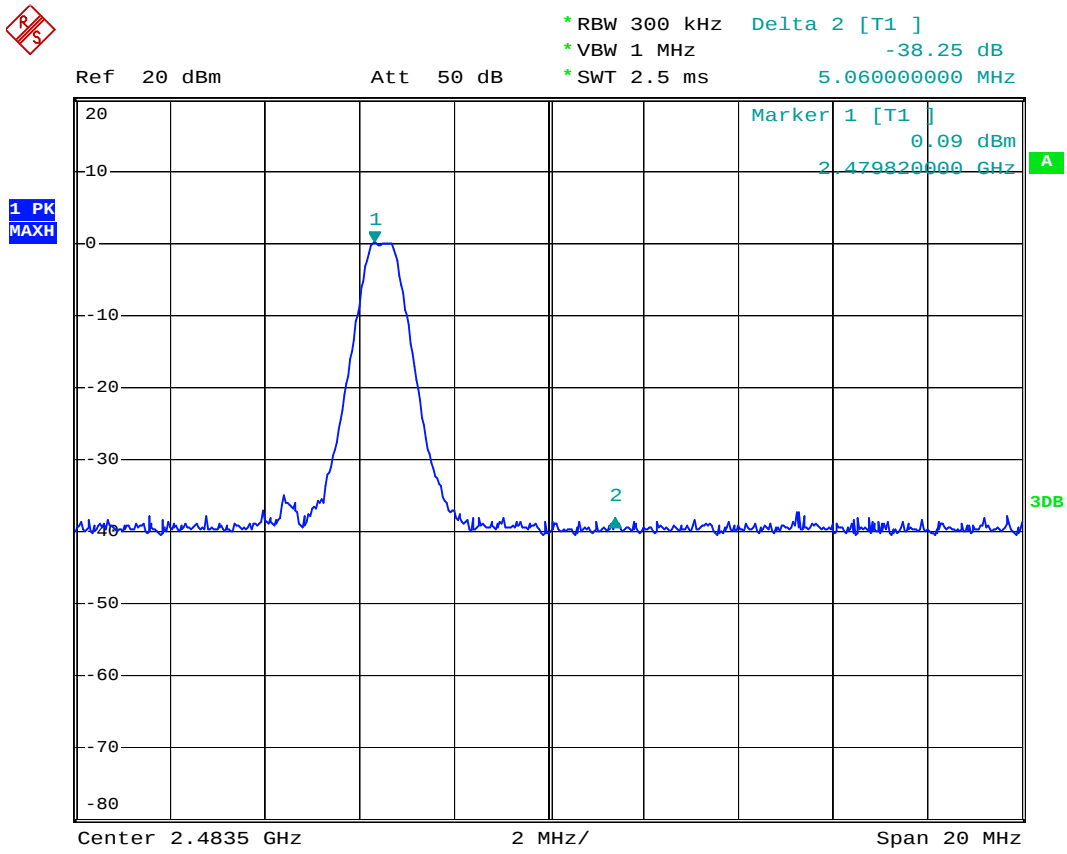
Date of Test:	<u>December 25, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX (Hopping on)</u>	Test Engineer:	<u>Rickey</u>

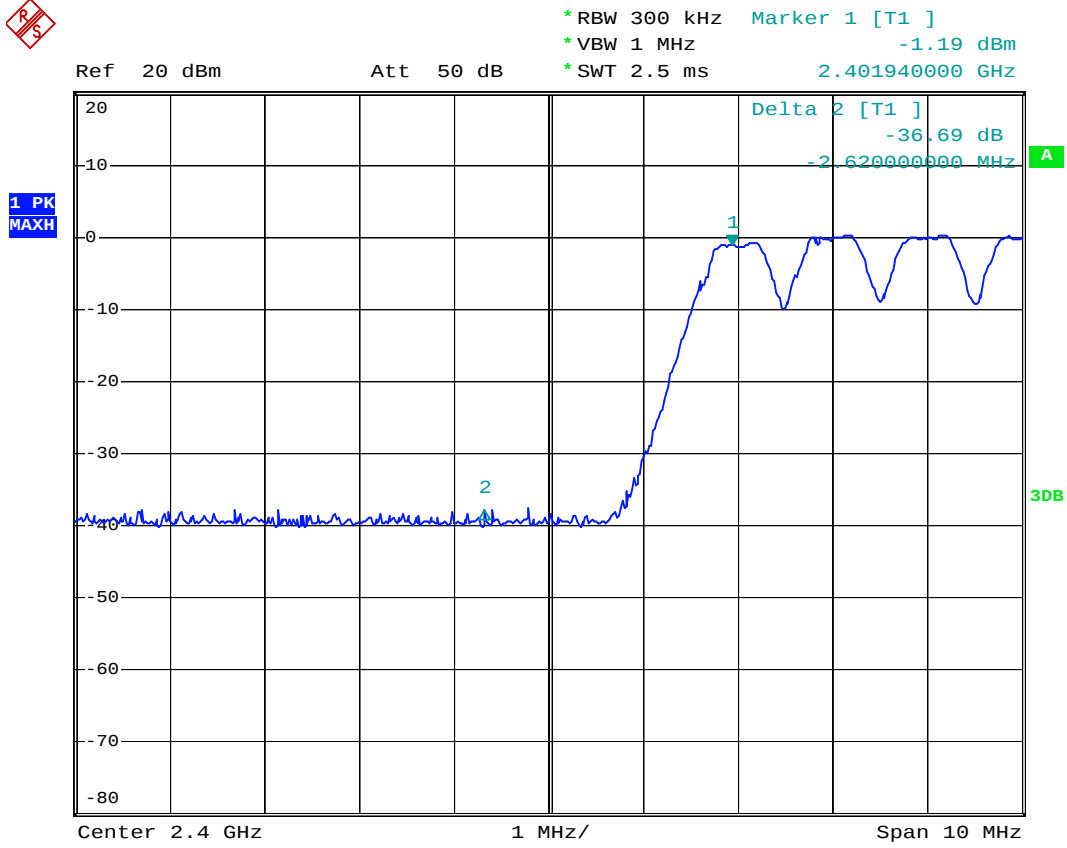
Conducted test

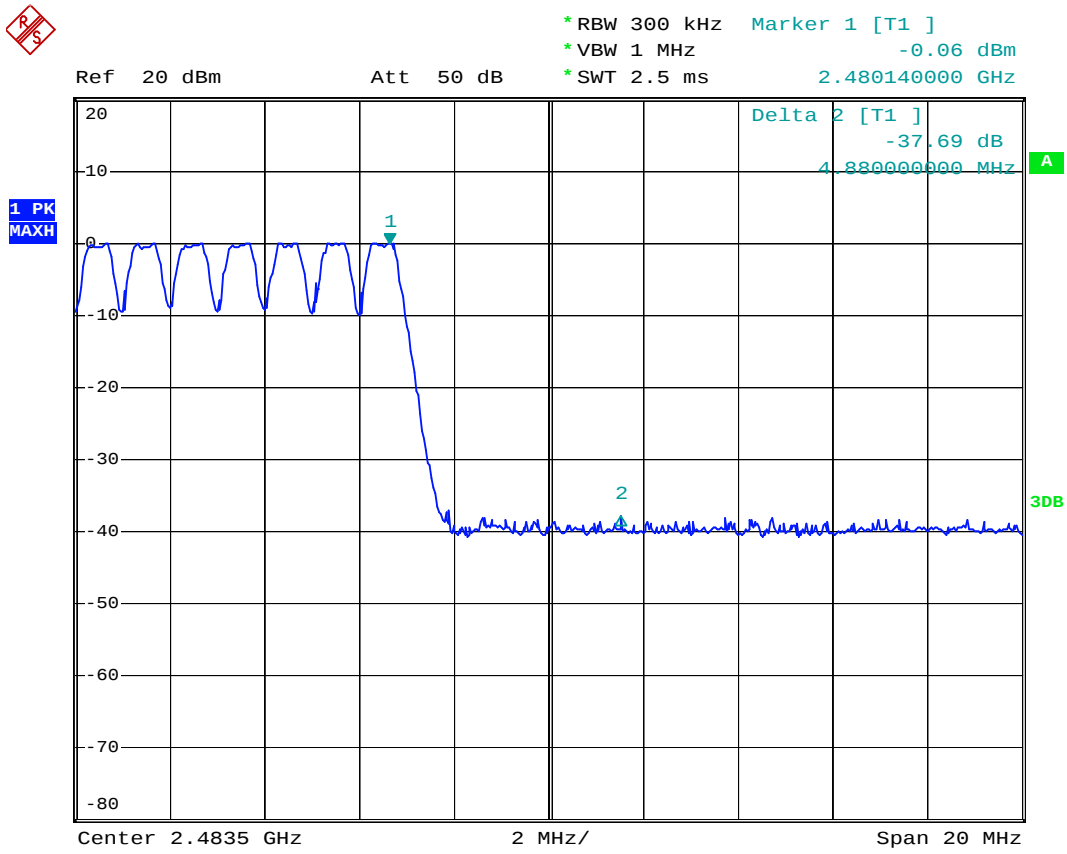
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2402	36.69	> 20dBc
2480	37.69	> 20dBc

"Spectrum analyzer" is R/S









Radiated Band Edge Result

Date of Test:	<u>December 25, 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth Speaker</u>	Humidity:	<u>50%</u>
Model No.:	<u>CQZ501-B</u>	Power Supply:	<u>DC 5V</u>
Test Mode:	<u>TX 2402MHz(Hopping off)</u>	Test Engineer:	<u>Rickey</u>

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2310.000	37.85	43.50	-7.81	30.04	35.69	54.00	74.00	-23.96	-38.31	Vertical
2356.237	37.60	45.21	-7.75	29.85	37.46	54.00	74.00	-25.15	-36.54	Vertical
2390.000	35.12	42.97	-7.53	27.59	35.44	54.00	74.00	-26.41	-38.56	Vertical
2310.000	35.40	43.50	-7.81	27.59	35.69	54.00	74.00	-26.41	-38.31	Horizontal
2356.237	42.21	37.31	-7.75	37.46	29.56	54.00	74.00	-16.54	-44.44	Horizontal
2390.000	36.67	43.41	-7.53	29.14	35.88	54.00	74.00	-24.86	-38.12	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$
3. Display the measurement of peak values.

Date of Test: December 25, 2013

Temperature: 25°C

EUT: iColor Lighting Bluetooth Speaker

Humidity: 50%

Model No.: CQZ501-B

Power Supply: DC 5V

Test Mode: TX 2480MHz (Hopping off)

Test Engineer: Rickey

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2483.500	36.30	42.30	-7.37	28.93	34.93	54.00	74.00	-25.07	-39.07	Vertical
2492.896	39.30	46.26	-7.39	31.91	38.87	54.00	74.00	-22.09	-35.13	Vertical
2500.000	38.73	44.00	-7.40	31.33	36.60	54.00	74.00	-22.67	-37.40	Vertical
2483.500	35.67	43.15	-7.37	28.30	35.78	54.00	74.00	-25.70	-38.22	Horizontal
2495.435	37.80	46.36	-7.39	30.41	38.97	54.00	74.00	-23.59	-35.03	Horizontal
2500.000	36.08	43.91	-7.70	28.68	36.51	54.00	74.00	-25.32	-37.49	Horizontal

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Date of Test: December 25, 2013

Temperature: 25°C

EUT: iColor Lighting Bluetooth Speaker

Humidity: 50%

Model No.: CQZ501-B

Power Supply: DC 5V

Test Mode: TX 2480MHz (Hopping on)

Test Engineer: Rickey

Frequency (MHz)	Reading(dBμV/m)		Factor(dB) Corr.	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	AV	PEAK		AV	PEAK	AV	PEAK	AV	PEAK	
2310.000	28.60	34.65	-6.99	21.61	27.66	54.00	74.00	-32.39	-46.34	Horizontal
2390.000	28.99	34.67	-6.78	22.21	27.89	54.00	74.00	-31.79	-46.11	Horizontal
2483.500	42.50	47.80	-6.54	35.96	41.26	54.00	74.00	-18.04	-32.74	Horizontal
2500.000	37.25	42.70	-6.50	30.75	36.20	54.00	74.00	-23.25	-37.80	Horizontal
2310.000	28.99	34.33	-6.99	22.00	27.34	54.00	74.00	-32.00	-46.66	Vertical
2390.000	30.00	35.02	-6.78	23.22	28.24	54.00	74.00	-30.78	-45.76	Vertical
2483.500	48.20	55.71	-6.54	41.66	49.17	54.00	74.00	-12.34	-24.83	Vertical
2500.000	37.22	41.94	-6.50	30.72	35.44	54.00	74.00	-23.28	-38.56	Vertical

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Non-hopping mode



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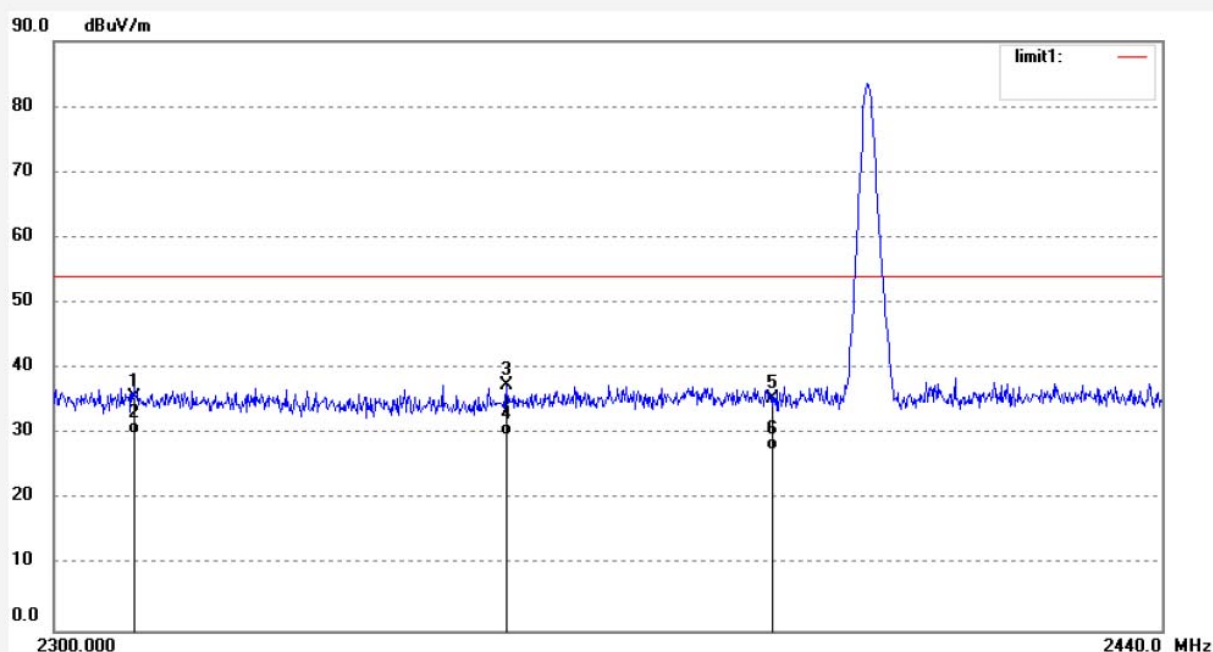
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Star_tmp #597
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 45 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2402MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Vertical
Power Source: DC 5V
Date: 2013-12-25
Time: 16:15:36
Engineer Signature:
Distance: 3m

Note: Report No.:ATE201232710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	43.50	-7.81	35.69	74.00	-38.31	peak			
2	2310.000	37.85	-7.81	30.04	54.00	-23.96	AVG			
3	2356.237	45.21	-7.75	37.46	74.00	-36.54	peak			
4	2356.237	37.60	-7.75	29.85	54.00	-24.15	AVG			
5	2390.000	42.97	-7.53	35.44	74.00	-38.56	peak			
6	2390.000	35.12	-7.53	27.59	54.00	-26.41	AVG			



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: Star_tmp #598

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 45 %

EUT: iColor Lighting Bluetooth Speaker

Mode: TX 2402MHz

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Horizontal

Power Source: DC 5V

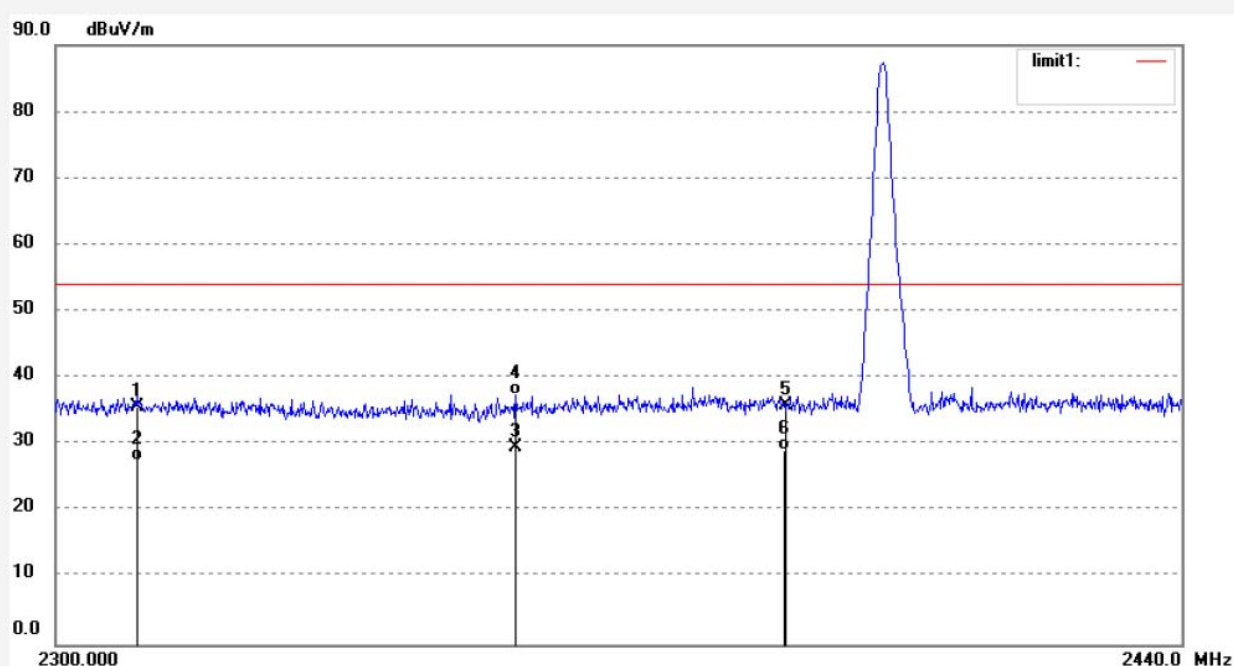
Date: 2013-12-25

Time: 16:15:58

Engineer Signature:

Distance: 3m

Note: Report No.:ATE201232710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	43.50	-7.81	35.69	74.00	-38.31	peak			
2	2310.000	35.40	-7.81	27.59	54.00	-26.41	AVG			
3	2356.237	37.31	-7.75	29.56	74.00	-44.44	peak			
4	2356.237	45.21	-7.75	37.46	54.00	-16.54	AVG			
5	2390.000	43.41	-7.53	35.88	74.00	-38.12	peak			
6	2390.000	36.67	-7.53	29.14	54.00	-24.86	AVG			



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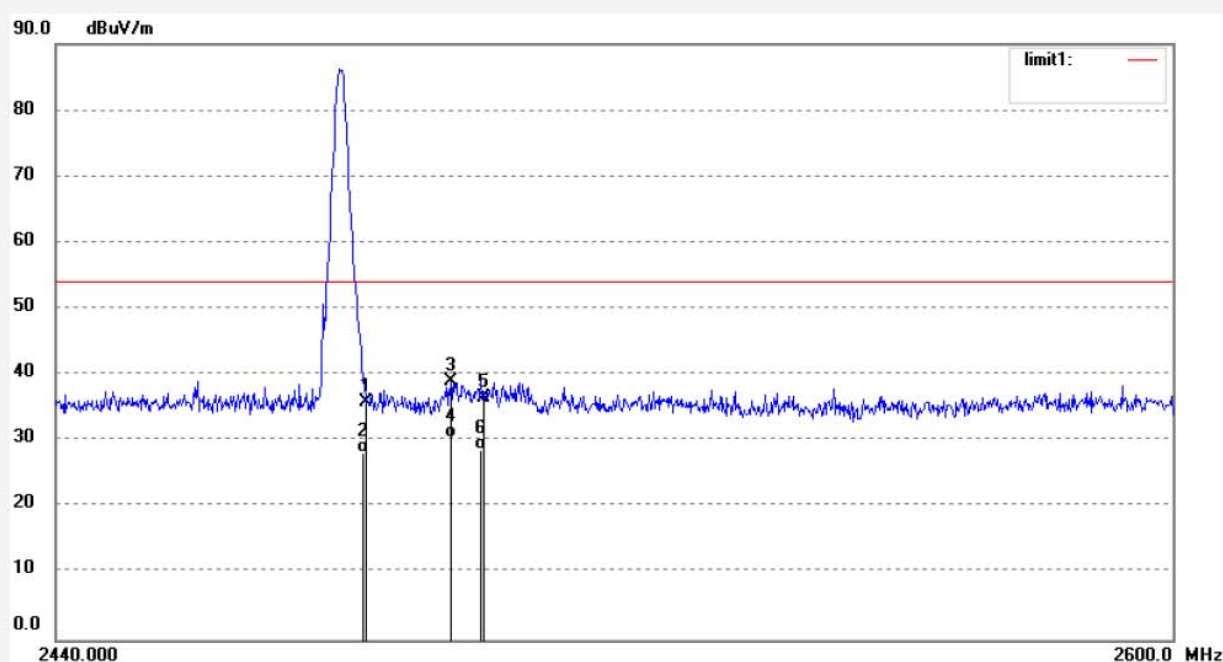
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Star_tmp #599
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 45 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2480MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Horizontal
Power Source: DC 5V
Date: 2013-12-25
Time: 16:17:19
Engineer Signature:
Distance: 3m

Note: Report No.:ATE201232710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	43.15	-7.37	35.78	74.00	-38.22	peak			
2	2483.500	35.67	-7.37	28.30	54.00	-25.70	AVG			
3	2495.435	46.36	-7.39	38.97	74.00	-35.03	peak			
4	2495.435	37.80	-7.39	30.41	54.00	-23.59	AVG			
5	2500.000	43.91	-7.40	36.51	74.00	-37.49	peak			
6	2500.000	36.08	-7.40	28.68	54.00	-25.32	AVG			



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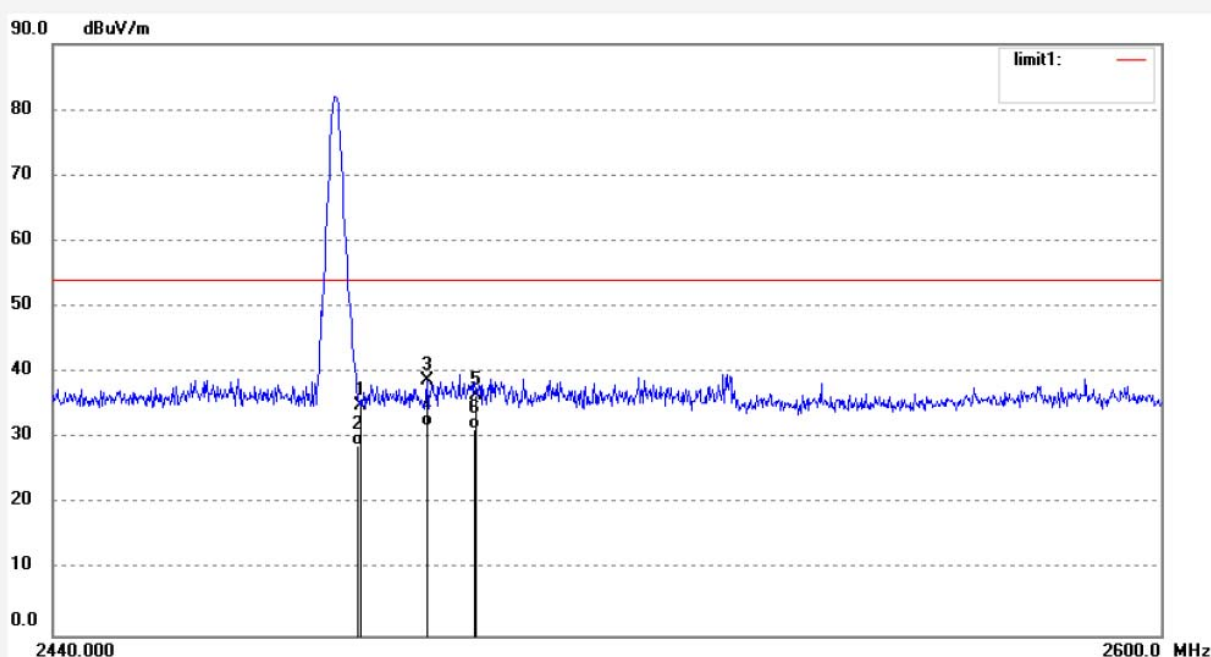
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Star_tmp #600
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 45 %
EUT: iColor Lighting Bluetooth Speaker
Mode: TX 2480MHz
Model: CQZ501-B
Manufacturer: Sure Wave

Polarization: Vertical
Power Source: DC 5V
Date: 2013-12-25
Time: 16:17:44
Engineer Signature:
Distance: 3m

Note: Report No.:ATE201232710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	42.30	-7.37	34.93	74.00	-39.07	peak			
2	2483.500	36.30	-7.37	28.93	54.00	-25.07	AVG			
3	2492.896	46.26	-7.39	38.87	74.00	-35.13	peak			
4	2492.896	39.30	-7.39	31.91	54.00	-22.09	AVG			
5	2500.000	44.00	-7.40	36.60	74.00	-37.40	peak			
6	2500.000	38.73	-7.40	31.33	54.00	-22.67	AVG			

Hopping mode



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: STAR #4269

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: HOPPING

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Horizontal

Power Source: DC 5V

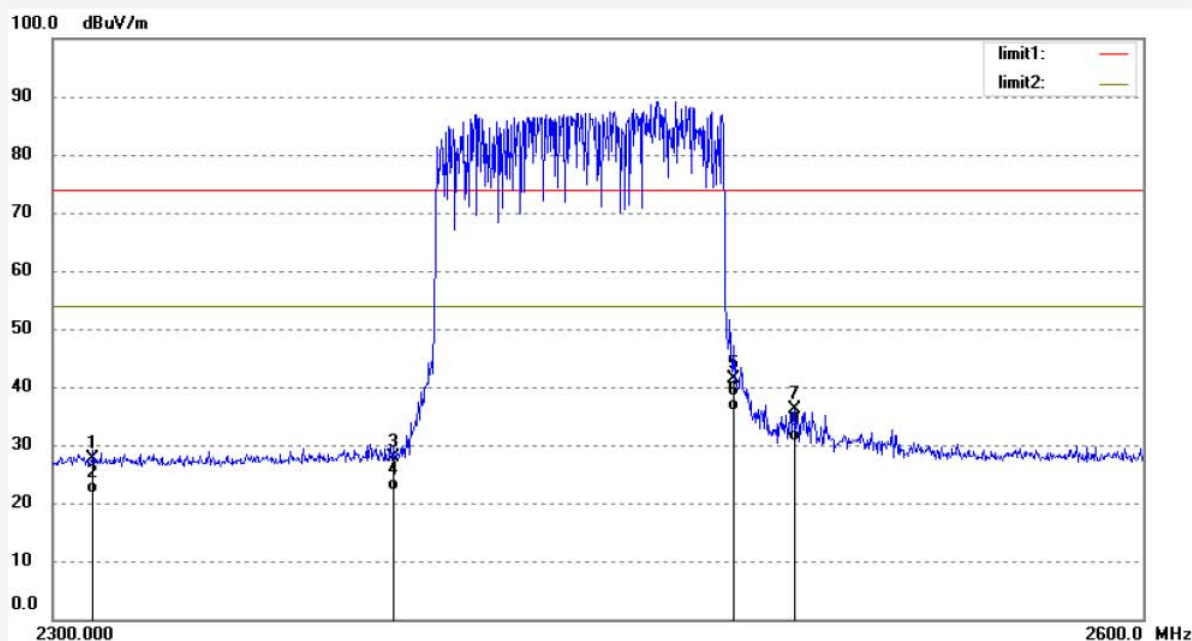
Date: 13/12/24/

Time: 14/46/59

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	34.65	-6.99	27.66	74.00	-46.34	peak			
2	2310.000	28.60	-6.99	21.61	54.00	-32.39	AVG			
3	2390.000	34.67	-6.78	27.89	74.00	-46.11	peak			
4	2390.000	28.99	-6.78	22.21	54.00	-31.79	AVG			
5	2483.500	47.80	-6.54	41.26	74.00	-32.74	peak			
6	2483.500	42.50	-6.54	35.96	54.00	-18.04	AVG			
7	2500.000	42.70	-6.50	36.20	74.00	-37.80	peak			
8	2500.000	37.25	-6.50	30.75	54.00	-23.25	AVG			



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Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR #4270

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: iColor Lighting Bluetooth Speaker

Mode: HOPPING

Model: CQZ501-B

Manufacturer: Sure Wave

Polarization: Vertical

Power Source: DC 5V

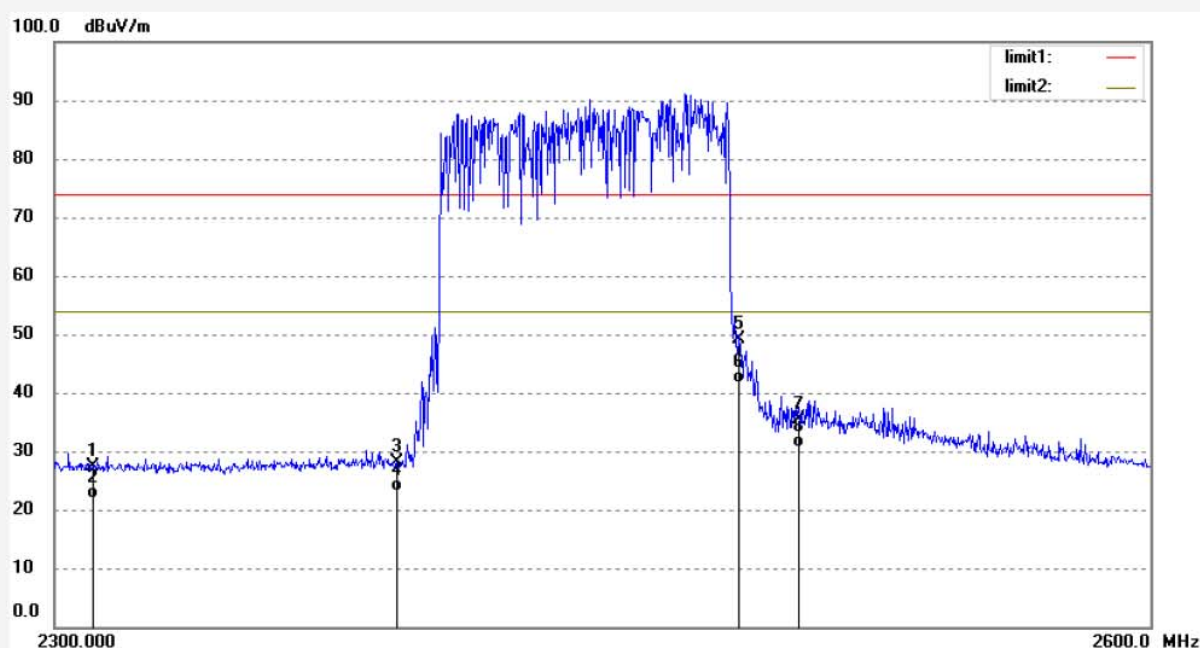
Date: 13/12/24/

Time: 14/50/55

Engineer Signature:

Distance: 3m

Note: Report No.:ATE20132710



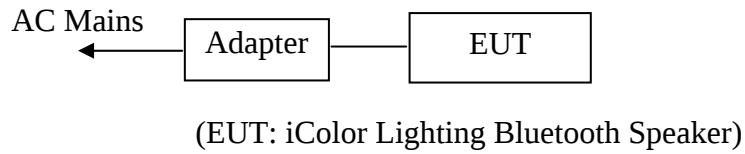
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2310.000	34.33	-6.99	27.34	74.00	-46.66	peak			
2	2310.000	28.99	-6.99	22.00	54.00	-32.00	AVG			
3	2390.000	35.02	-6.78	28.24	74.00	-45.76	peak			
4	2390.000	30.00	-6.78	23.22	54.00	-30.78	AVG			
5	2483.500	55.71	-6.54	49.17	74.00	-24.83	peak			
6	2483.500	48.20	-6.54	41.66	54.00	-12.34	AVG			
7	2500.000	41.94	-6.50	35.44	74.00	-38.56	peak			
8	2500.000	37.22	-6.50	30.72	54.00	-23.28	AVG			

12.AC POWER LINE CONDUCTED EMISSION FOR FCC PART

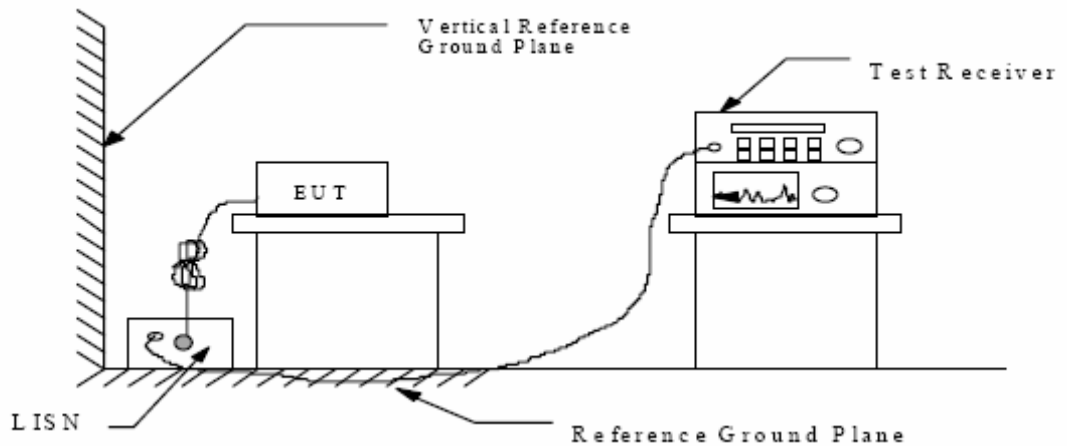
15 SECTION 15.207(A)

12.1.Block Diagram of Test Setup

12.1.1.Block diagram of connection between the EUT and simulators



12.1.2.Shielding Room Test Setup Diagram



(EUT: iColor Lighting Bluetooth Speaker)

12.2.The Emission Limit

12.2.1.Conducted Emission Measurement Limits According to Section 15.207(a)

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

* Decreases with the logarithm of the frequency.

12.3.Configuration of EUT on Measurement

The following equipment are installed on the Conducted Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

12.3.1. iColor Lighting Bluetooth Speaker (EUT)

Model Number : CQZ501-B
Serial Number : N/A
Manufacturer : Sure Wave (HongKong) Limited

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 11.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX (Operation) mode measure it.

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4- 2009 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

The frequency range from 150 kHz to 30MHz is checked.

12.6. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150 kHz to 30MHz is checked.

Date of Test:	<u>December 25 2013</u>	Temperature:	<u>25°C</u>
EUT:	<u>iColor Lighting Bluetooth</u>	Humidity:	<u>50%</u>
Model No.:	<u>Speaker</u>	Power Supply:	<u>AC 120V/60Hz</u>
Test Mode:	<u>CQZ501-B</u>	Test Engineer:	<u>Rickey</u>
	<u>Charging</u>		

Frequency (MHz)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector	Line
0.496827	49.60	56	-6.5	QP	Neutral
0.467950	40.00	57	-16.6	QP	
2.082610	41.40	56	-14.6	QP	
20.187874	38.00	60	-22.0	QP	
0.566784	37.00	46	-9.0	AV	
2.462770	41.50	46	-4.5	AV	
20.187874	34.70	50	-15.3	AV	
0.467950	40.00	57	-16.6	QP	Live
1.513251	36.20	56	-19.8	QP	
20.349700	31.40	60	-28.6	QP	
0.469822	37.20	47	-9.3	AV	
1.419618	35.50	46	-10.5	AV	
19.788917	27.40	50	-22.6	AV	

Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

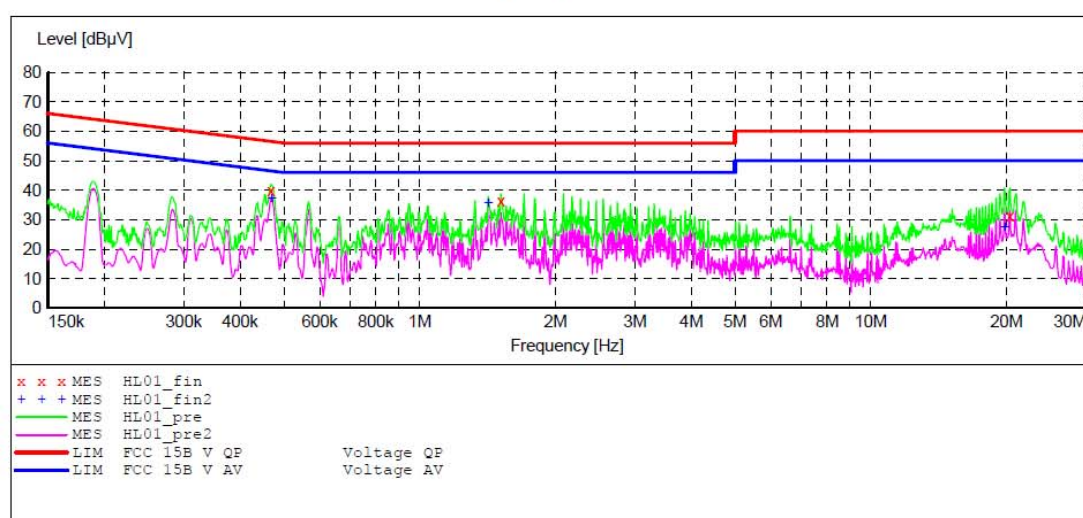
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: iColor Lighting Bluetooth Speaker M/N:CQZ501-B
 Manufacturer: Sure Wave
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: L 120V/60Hz
 Comment: Report No:ATE20132710
 Start of Test: 12/25/2013 / 10:00:41AM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "HL01_fin"

12/25/2013 10:03AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.467950	40.00	12.5	57	16.6	QP	L1	GND
1.513251	36.20	12.4	56	19.8	QP	L1	GND
20.349700	31.40	12.1	60	28.6	QP	L1	GND

MEASUREMENT RESULT: "HL01_fin2"

12/25/2013 10:03AM

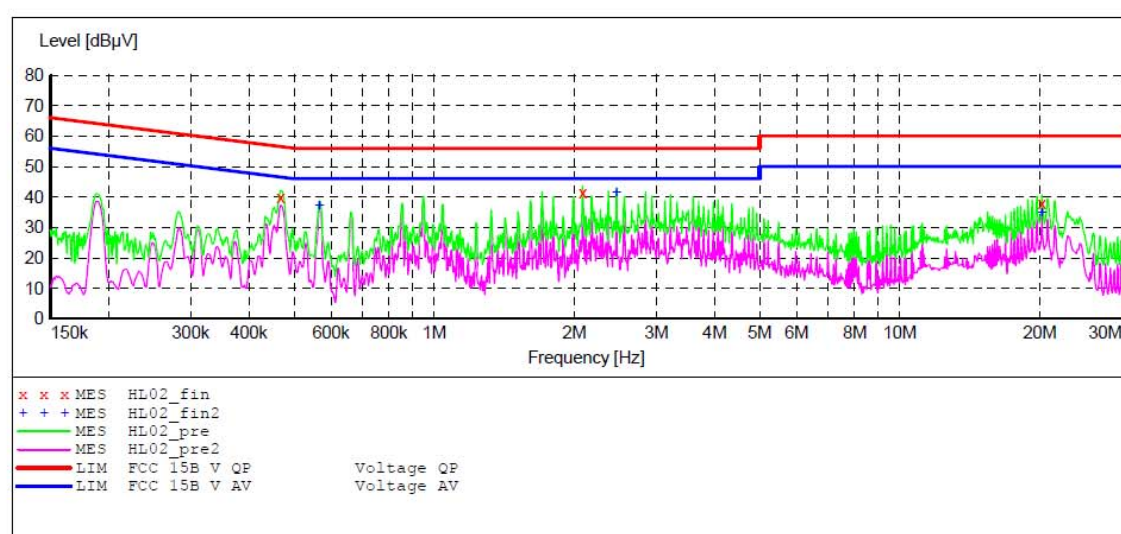
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.469822	37.20	12.5	47	9.3	AV	L1	GND
1.419618	35.50	12.4	46	10.5	AV	L1	GND
19.788917	27.40	12.1	50	22.6	AV	L1	GND

ACCURATE TECHNOLOGY CO., LTD**CONDUCTED EMISSION STANDARD FCC PART 15B**

EUT: iColor Lighting Bluetooth Speaker M/N:CQZ501-B
 Manufacturer: Sure Wave
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Star
 Test Specification: N 120V/60Hz
 Comment: Report No:ATE20132710
 Start of Test: 12/25/2013 / 10:03:43AM

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average

**MEASUREMENT RESULT: "HL02_fin"**

12/25/2013 10:05AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.467950	40.00	12.5	57	16.6	QP	N	GND
2.082610	41.40	12.4	56	14.6	QP	N	GND
20.187874	38.00	12.1	60	22.0	QP	N	GND

MEASUREMENT RESULT: "HL02_fin2"

12/25/2013 10:05AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.566784	37.00	12.6	46	9.0	AV	N	GND
2.462770	41.50	12.4	46	4.5	AV	N	GND
20.187874	34.70	12.1	50	15.3	AV	N	GND

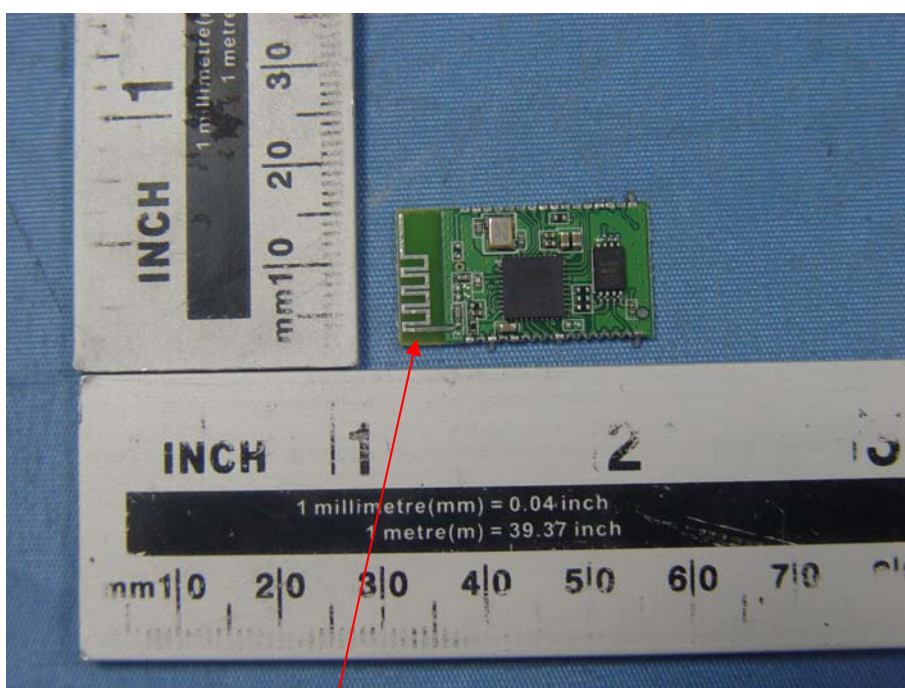
13.ANTENNA REQUIREMENT

13.1.The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

13.2.Antenna Construction

The antenna is PCB Layout antenna, no consideration of replacement. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna