



Report No.: TW2012404E File reference No.: 2021-01-14

Applicant: TOPSAIL (HONG KONG) LIMITED

Product: Bluetooth Speaker

Model No.: 902B,901B,903B,904B,905B,910B

Brand Name: N/A

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10&FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility



Dated: January 14, 2021

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

# SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

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# **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

## **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

# FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

# Industry Canada (IC) —Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

# A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

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# **Test Report Conclusion**

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#### 1.0 General Details

#### 1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le

Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189 For 3m Anechoic Chamber

#### 1.2 Applicant Details

Applicant: TOPSAIL (HONG KONG) LIMITED

Address: Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, Kowloon, HongKong

Telephone: 852 2668 1868 Fax: 852 2668 1868

# 1.3 Description of EUT

Product: Bluetooth Speaker

Manufacturer: TOPSAIL (HONG KONG) LIMITED

Address: Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui,

Kowloon, HongKong

Brand Name: N/A

Model Number: 902B, 901B,903B,904B,905B,910B

Test Model No.: 902B

Remark: These models are identical in interior structure, electrical circuits and components, different model names for the marketing requirement.

Hardware Version: V1.0

Software Version: V003

Serial No.: 2021010001. 2021010002. 2021010003...

Rating: DC5V or Built-in DC 3.7V/1200mAh Li-ion battery;

Modulation Type: GFSK, Pi/4D-QPSK, 8DPSK (Bluetooth)

Operation Frequency: 2402-2480MHz

Channel Separate: 1MHz
Channel Number: 79

Antenna Designation PCB antenna with gain -0.40dBi Max (Get from the antenna specification

provided by the applicant)

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1.4 Submitted Sample: 1 Sample

1.5 Test Duration

2020-12-31 to 2021-01-13

1.6 Test Uncertainty

Conducted Emissions Uncertainty = 3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty =6.0dB

Occupied Channel Bandwidth Uncertainty =5%

Conducted Emissions Uncertainty =3.6dB

Note: The measurement uncertainty is for governge factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

The sample tested by

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2020-06-23	2021-06-22
LISN	R&S	EZH3-Z5	100294	2020-06-23	2021-06-22
LISN	R&S	EZH3-Z5	100253	2020-06-23	2021-06-22
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2020-06-23	2021-06-22
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2020-06-23	2021-06-22
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2020-06-23	2021-06-22
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2020-06-23	2021-06-22
Power sensor	Anritsu	MA2491A	32263	2020-06-23	2021-06-22
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic			N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2020-06-23	2021-06-22
EMI Test Receiver	RS	ESH3	860904/006	2020-06-23	2021-06-22
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2020-06-23	2021-06-22
Spectrum	HP/Agilent	E4407B	MY50441392	2020-06-23	2021-06-22
Spectrum	RS	FSP	1164.4391.38	2020-01-16	2021-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA		2020-06-23	2021-06-22
RF Cable	Zhengdi	7m		2020-06-23	2021-06-22
RF Switch	EM	EMSW18	060391	2020-06-23	2021-06-22
Pre-Amplifier	Schwarebeck	BBV9743	#218	2020-06-23	2021-06-22
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2020-06-23	2021-06-22
LISN	SCHAFFNER	NNB42	00012	2020-01-07 2021-01-06	2021-01-06 2022-01-05

#### 2.2 Automation Test Software

# For Conducted Emission Test

Name	Version
EZ-EMC	Ver.EMC-CON 3A1.1

#### For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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#### 3.0 Technical Details

# 3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Paragraph 15.209 and RSS-210	Radiated Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies

#### 3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.249, ANSI C63.4:2014 and ANSI C63.10:2013

## 4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

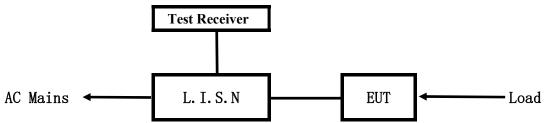
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#### 5. Power Line Conducted Emission Test

#### 5.1 Schematics of the test

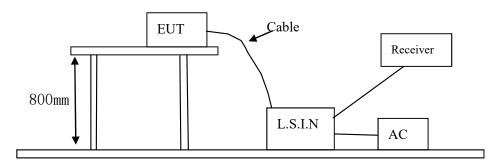


**EUT: Equipment Under Test** 

# 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013. Test Voltage: AC120V 60Hz.

#### Block diagram of Test setup



# 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

#### A. EUT

Device	Manufacturer	Model	FCC ID
Bluetooth Speaker	th Speaker TOPSAIL (HONG KONG) LIMITED		2ACCE-BT902
Dideloon Speaker	TOP SAIL (HONG KONG) LIWITED	904B,905B,910B	2ACCE-B1902

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#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

# C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	KEYU	KA23-0502000DEU	Input: 100-240V~, 50/60Hz, 0.35A;
			Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2013

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

E (MII-)	Class B Lim	nits (dB µ V)
Frequency(MHz)	Quasi-peak Level	Average Level
$0.15 \sim 0.50$	66.0~56.0*	56.0~46.0*
$0.50 \sim 5.00$	56.0	46.0
$5.00 \sim 30.00$	60.0	50.0

Notes:

- 1. \*Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

#### 5.6 Test Results:

Pass

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# A: Conducted Emission on Live Terminal (150kHz to 30MHz)

**EUT Operating Environment** 

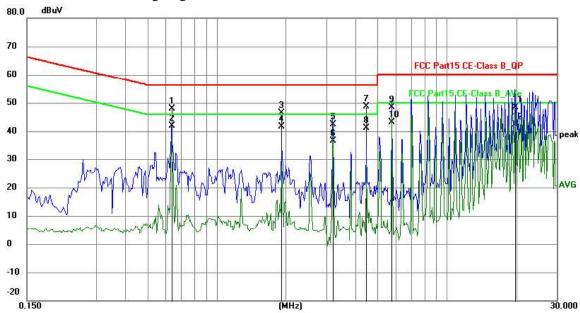
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Charging and Communication by Bluetooth** 

**Equipment Level: Class B** 

**Results: PASS** 

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.6375	38.03	9.78	47.81	56.00	-8.19	QP	Р
2	0.6375	32.18	9.78	41.96	46.00	-4.04	AVG	Р
3	1.9167	36.69	9.80	46.49	56.00	-9.51	QP	Р
4	1.9167	31.93	9.80	41.73	46.00	-4.27	AVG	Р
5	3.1989	32.61	9.85	42.46	56.00	-13.54	QP	Р
6	3.1989	26.71	9.85	36.56	46.00	-9.44	AVG	Р
7	4.4703	38.82	9.91	48.73	56.00	-7.27	QP	Р
8	4.4703	31.19	9.91	41.10	46.00	-4.90	AVG	Р
9	5.7495	38.35	9.96	48.31	60.00	-11.69	QP	Р
10	5.7495	33.18	9.96	43.14	50.00	-6.86	AVG	Р
11	19.7973	37.81	10.67	48.48	60.00	-11.52	QP	Р
12	19.7973	31.73	10.67	42.40	50.00	-7.60	AVG	Р

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# B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

**EUT Operating Environment** 

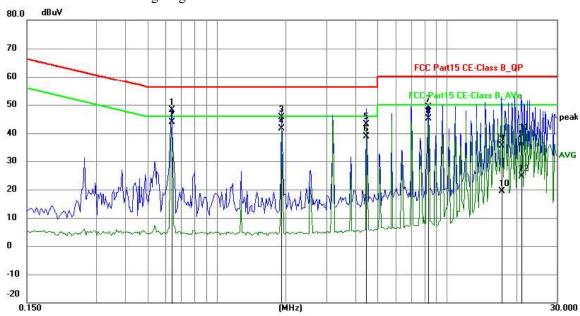
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Charging and Communication by Bluetooth** 

**Equipment Level: Class B** 

**Results: Pass** 

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.6375	38.42	9.78	48.20	56.00	-7.80	QP	Р
2	0.6375	34.05	9.78	43.83	46.00	-2.17	AVG	Р
3	1.9128	35.90	9.80	45.70	56.00	-10.30	QP	Р
4	1.9128	31.72	9.80	41.52	46.00	-4.48	AVG	Р
5	4.4664	33.29	9.91	43.20	56.00	-12.80	QP	Р
6	4.4664	29.01	9.91	38.92	46.00	-7.08	AVG	Р
7	8.3040	39.01	10.08	49.09	60.00	-10.91	QP	Р
8	8.3040	35.13	10.08	45.21	50.00	-4.79	AVG	Р
9	17.2350	25.15	10.51	35.66	60.00	-24.34	QP	Р
10	17.2350	8.82	10.51	19.33	50.00	-30.67	AVG	Р
11	21.0687	28.56	10.75	39.31	60.00	-20.69	QP	Р
12	21.0687	13.80	10.75	24.55	50.00	-25.45	AVG	Р

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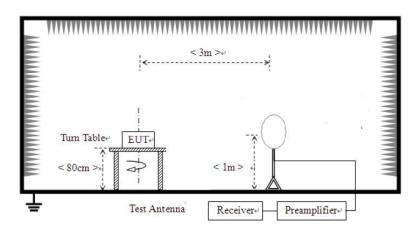


#### **6** Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

#### **Block diagram of Test setup**

For radiated emissions from 9kHz to 30MHz

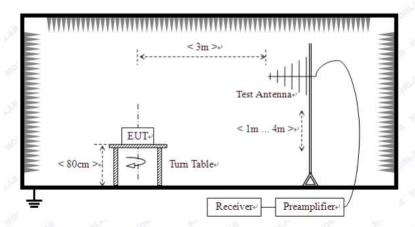


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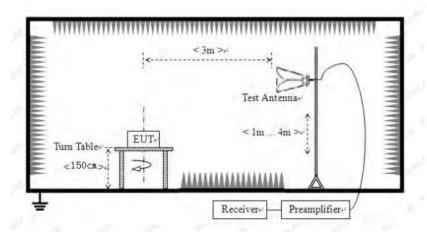
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For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



- 6.2 Configuration of The EUT

  Same as section 5.3 of this report
- 6.3 EUT Operating Condition
  Same as section 5.4 of this report.
- 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

# A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Stre	Field Strength of Fundamental (3m)		Field Strength of Harmonics (3m)		
(MHz)	mV/m	dBuV/m	uV/m	dBuV/m		

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2400-2483.5 50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)
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Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

# B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 5. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK. For fundamental measurement, PK detector used.
- 6. Battery full charged during tests.
- 7. The three modulation modes of GFSK, Pi/4D-QPSK, and 8DPSK were tested. And only the worst case was recorded in the test report. GFSK was the worst case.

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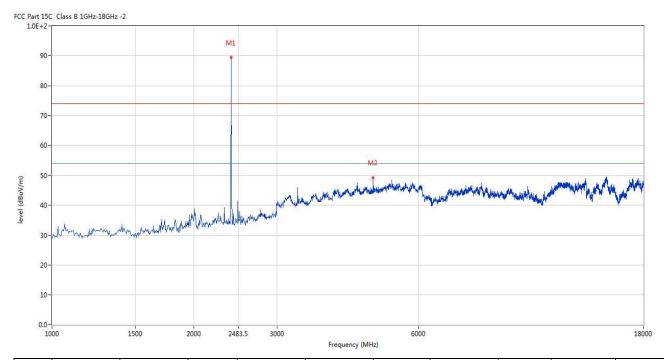


#### 6.5 Test result

# A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2402MHz

#### Horizontal



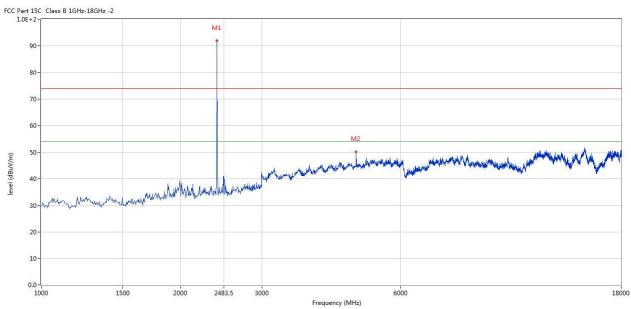
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2402.500	89.38	-3.57	114.0	-24.62	Peak	191.00	100	Horizontal	Pass
2	4803.750	49.24	3.13	74.0	-24.76	Peak	342.00	100	Horizontal	Pass

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## Vertical



1	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict	
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)			
	1	2402.500	91.85	-3.57	114.0	-22.15	Peak	178.00	100	Vertical	Pass	
2	2	4803.750	50.00	3.13	74.0	-24.00	Peak	302.00	100	Vertical	Pass	

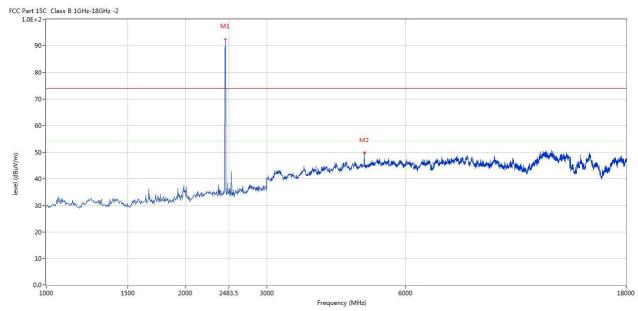
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Please refer to the following test plots for details: Middle Channel-2441MHz

#### Horizontal



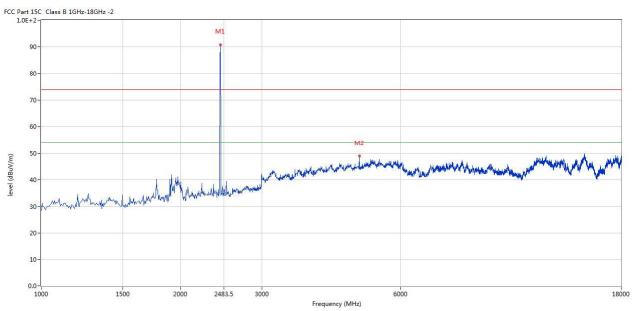
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2440.750	92.46	-3.57	114.0	-21.54	Peak	347.00	100	Horizontal	Pass
2	4880.250	49.70	3.20	74.0	-23.30	Peak	360.00	100	Horizontal	Pass

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## Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2440.750	90.79	-3.57	114.0	-23.21	Peak	45.00	100	Vertical	Pass
2	4880.250	49.03	3.20	74.0	-23.97	Peak	159.00	100	Vertical	Pass

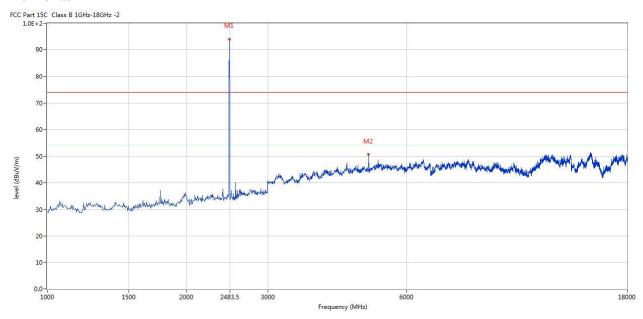
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Please refer to the following test plots for details: High Channel-2480MHz

#### Horizontal



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2479.750	94.25	-3.57	114.0	-19.75	Peak	354.00	100	Horizontal	Pass
1*	2479.750	82.53	-3.57	94.0	-11.47	AV	354.00	100	Horizontal	Pass
2	4961.000	50.14	3.36	74.0	-23.86	Peak	126.00	100	Horizontal	Pass

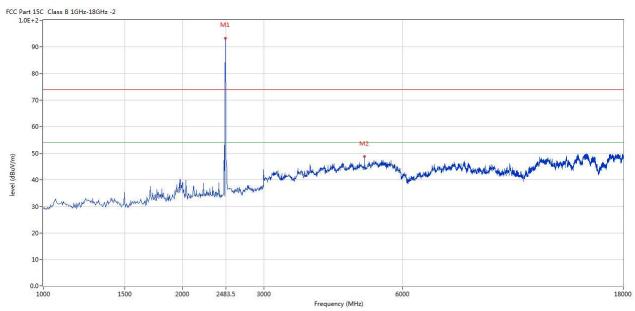
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#### Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2479.750	93.21	-3.57	114.0	-20.79	Peak	171.00	100	Vertical	Pass
1*	2479.750	81.65	-3.57	94.0	-12.35	AV	171.00	100	Vertical	Pass
2	4961.000	49.15	3.36	74.0	-24.85	Peak	185.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

- (3)Margin=Emission-Limits
- (4)According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) For test purpose, keep EUT continuous transmitting
- (5) For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.
- (6) the measured PK value less than the AV limit. No necessary to take down the AV measurement value.

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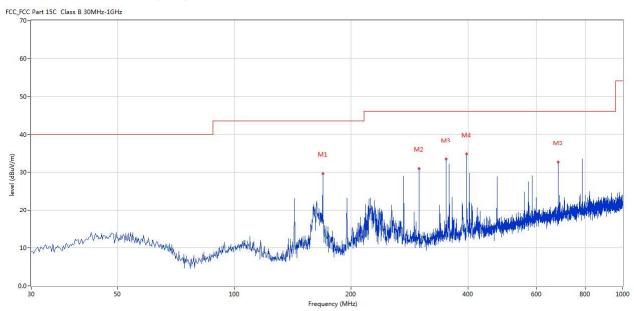


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	168.918	29.63	-16.11	43.5	-13.87	Peak	22.00	100	Horizontal	Pass
2	298.865	30.96	-11.10	46.0	-15.04	Peak	12.00	100	Horizontal	Pass
3	350.990	33.42	-9.36	46.0	-12.58	Peak	1.00	100	Horizontal	Pass
4	396.568	34.81	-8.74	46.0	-11.19	Peak	0.00	100	Horizontal	Pass
5	682.404	32.69	-4.42	46.0	-13.31	Peak	0.00	100	Horizontal	Pass

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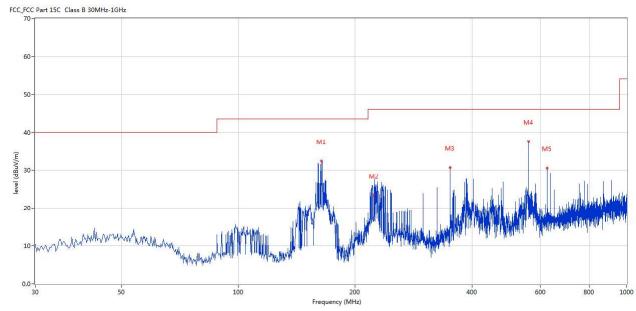


#### Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	Limit (dB)			(cm)		
1	163.584	24.37	-16.33	43.5	-19.13	Peak	360.00	100	Vertical	Pass
2	224.436	23.60	-13.00	46.0	-22.40	Peak	360.00	100	Vertical	Pass
3	350.990	30.74	-9.36	46.0	-15.26	Peak	360.00	100	Vertical	Pass
4	559.003	39.54	-6.30	46.0	-6.46	Peak	360.00	100	Vertical	Pass
5	637.068	33.24	-4.73	46.0	-12.76	Peak	360.00	100	Vertical	Pass

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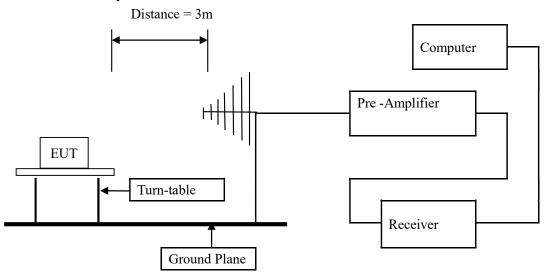


#### 7. Band Edge

#### 7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

## 7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

#### 7.3 Configuration of The EUT

Same as section 5.3 of this report

# 7.4 EUT Operating Condition

Same as section 5.4 of this report.

#### 7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

The report refers only to the sample tested and does not apply to the bulk.

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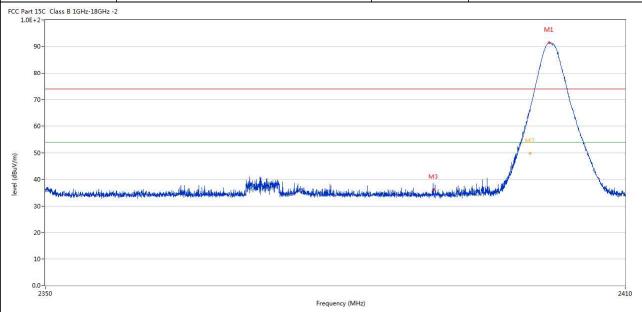
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#### 7.6 Test Result

Product:	Bluetooth Speaker	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
2	2400.040	65.60	-3.57	74.0	-8.40	Peak	340.00	100	Horizontal	Pass
2**	2400.040	49.69	-3.57	54.0	-4.31	AV	340.00	100	Horizontal	Pass
3	2390.020	36.07	-3.53	74.0	-37.93	Peak	234.00	100	Horizontal	Pass

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Prod	luct:		Blueto	oth Speaker		Detec	tor		Vertical	
Mo	ode		Keeping	Transmittin	ng	Test Vol	ltage	]	DC3.7V	
Tempe	erature		24	deg. C,		Humid	lity		56% RH	
Test R	Result:			Pass						
90- 80- 70-	sss B 1GHz-18GHz -2								M1	
40- 40- 20- 10- 2350	maria lafornital (de pad precupid	roparish parameter and are a second	unadaneenteende	assistant also de la constitución de la constitució	inthamples and his sales	Inschalest replaced accept	N3 Hardel Mark	A Marie and Area of Marie and Marie		2410
30 - 20 - 10 - 0.0 - 2350			madensialization	assistant alandara	Frequency (MH	ı	N3 H			2410
30- 20- 10- 0.0- 2350	Frequency	Results	Factor	Limit	Over Limit	z) Detector	Table (o)	Height	ANT	910099.290
30 - 20 - 10 - 0.0 - 2350	Frequency (MHz)	Results (dBuV/m)	(dB)	(dBuV/m)	Over Limit (dB)	Detector	, ,	Height (cm)	ANT	Verdic
30- 20- 10- 2350	Frequency (MHz) 2400.040	Results (dBuV/m) 66.94	(dB) -3.57	(dBuV/m) 74.0	Over Limit (dB) -7.06	Detector Peak	170.00	Height (cm)	ANT Vertical	Verdic Pass
40- 30- 20- 10- 2350	Frequency (MHz)	Results (dBuV/m)	(dB)	(dBuV/m)	Over Limit (dB)	Detector	, ,	Height (cm)	ANT	Verdic

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2483.520

41.78

-3.57

54.0



PI	roduct:		Bluet	ooth Speake	er	Pola	rity		Horizontal	
I	Mode		Keepin	g Transmitt	ing	Test Vo	oltage		DC3.7V	
Ten	nperature		2	4 deg. C,		Humi	dity		56% RH	
Tes	st Result:			Pass						
Part 15C	C Class B 1GHz-18GHz	: -2								
90 - 80 - 70 -										
50 <b>-</b>			<b>/</b>					4	T.	
14884		AND THE PROPERTY OF THE PERSON NAMED AND POST OF THE PERSON NAMED AND PASS				the made was	a secundariji da da amid qulaya), a	May have product representative	d et average and the state of t	one of any lotter later of the
40-	المسترس وأمر والمراد و	describe de la distribución de la describación de l	par de la companya de			Made de Made d	. જાત તમ્મી અને તે ત્રી સ્વાર્થનો ત્રી સ્વાર્થનો ત્રી સ્વાર્થનો ત્રી સ્વાર્થનો ત્રી સ્વાર્થનો ત્રી સ્વાર્થનો ત	Majohandrikajarengia	d share any shakis share share	ourse and their second stables
40- 30- 20- 10-	indiana, angkan di dan 3 di mpinané anak pad	Maria Ma			2483.5 Frequency (MH		n serve a staronje i de ste somi e a sterot je	Market and the second	al and a second second second second	2500
40- 30- 20- 10- 0.0-1 24	indian, softing death of the principle o	Results	Factor	Limit	2483.5		Table (o)	Height	ANT	2500
40- 30- 20- 10-	industrial and approximation of the second		Factor (dB)	Limit (dBuV/m)	2483.5 Frequency (MH	(z)		70.700	ANT	1,703030

ΑV

121.00

100

Horizontal

Pass

-12.22

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P	roduct:		Blueto	oth Speaker		Detec	tor		Vertical	
	Mode		Keeping	Transmittii	ng	Test Vo	ltage		DC3.7V	
Ten	nperature		24	deg. C,		Humio	lity		56% RH	
Tes	st Result:			Pass						
90- 80-	i-	:-2								
60-										
evel (dBuV/m) 40-		والمراجع والمتناط والمتناط والمتناط والمتناط والمتناط			1	hiral good, extendiques and	instaalandeesteesteesteesteesteesteesteesteestees	المائد مساور والمائد و	engladiyladya sürkisində olkisi mi	ondra sensa i Alaska dadinari
<u>o</u>	-									
0.00	-									
20· 10·	-				2483.5 Frequency (N	MHz)				2500
30· 20· 10·	-  -	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)		IHz) Detector	Table (o)	Height (cm)	ANT	2500 Verdict
20· 10· 0.0· 2·	Frequency				Frequency (N		Table (o) 51.00		ANT Vertical	170701888

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

- 2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 3. The three modulation modes of GFSK, Pi/4D-QPSK, and 8DPSK were tested. And only the worst case was recorded in the test report. GFSK was the worst case.

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# 8.0 Antenna Requirement

#### Applicable Standard

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

This product has a PCB antenna. The antenna gain is -0.40dBi Max. It fulfills the requirement of this section. Test Result: Pass

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9.0 20dB Bandwidth M	Measurement							
GFSK Modulation								
Product:	Blueto	oth Speaker		Test Mod	e:	Keep tra	nsmitting	
Mode	Keeping	Transmitting		Test Volta	ge	DC3	3.7V	
Temperature	24	deg. C,		Humidit	y	56%	RH	
Test Result:		Pass		Detector	r	P	K	
20dB Bandwidth	820	0.64kHz				-	-	
<u> </u>	Delta 1	[T1]	RI	BW 30	kHz	RF Att	40 dB	
Ref Lvl		-1.35 dB	VI	BW 100	kHz			
10 dBm	820.	64128257 kHz	SI	WT 8.5	ms	Unit	dBm	ı
10				_	1 [T1]	-1	9.14 dBm	
		2				2.4017	259 GHz	A
0		X		_	1 [T1]	_	1.35 dB	
			$\wedge \wedge$			820.64128		
-10			-	$\nabla$	2 [T1]	- 4000	0.72 dBm	
		1 ممم				2.40201	L202 GHz	
-20 <del>120</del> .72	<del>dDm</del>							
1MAX				1				1MA
-30		•			نح			
	/				M			
-40	<i></i>				ţ			
-50 May may be to the last	John British				L. L. L.			
-50			1			40	inthaties	
							ALCONOMINE TO	
-60			1					
-70			1					
-80								
-90								
	2165331 GHz	300	kHz/	-	-	Spa	an 3 MHz	
Date: 12.J	AN.2021 13:3	31:05						

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Product:		Bluet	tooth Spea	ker	T	est Mode:		Keep tra	nsmitting	
Mode			ng Transmi			est Voltage			3.7V	
Temperature			4 deg. C,	<u> </u>		Humidity			6 RH	
Test Result:			Pass			Detector			PK	
20dB Bandwidth		8	29.66kHz							
EA		Delta 1	[T1]		RBW	30 k	Hz F	RF Att	40 dB	
Ref Lvl				.61 dB	VBW		Hz			
10 dBm	0 dBm 829.65931864 kF				SWT	8.5 m	ıs (	Jnit	dBn	n
10						<b>V</b> 1	[T1]	-2	0.56 dBm	A
				2				2.4407	8357 GHz	E
0				Å	_	<b>^</b> 1	[T1]		0.61 dB	
					W	<b>₽</b> °		29.6593		
-10				<del>                                     </del>		<b>∇</b> 2	[T1]	2.4410	0.49 dBm 1202 GHz	1
			1	and the same of th	مما	1		2.4410	1202 9112	
-20 <del></del>	9 dBm					<del></del>				ł
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		لمرا					7			
-40							1			
	A CONTRACTOR	للمحصر					1			
-50	,A.T.						\ <u></u>			
N. May								W.C.	which the second	
60										
-60										
-70										1
-80										1
-90									an 3 MHz	]

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Product:		Bluet	tooth Spea	ker	T	est Mode:		Keep tr	ansmitt	ing	
Mode			ng Transmi		Te	est Voltage			C3.7V		
Temperature			24 deg. C,			Humidity			% RH		
Test Result:			Pass			Detector			PK		
20dB Bandwidth		8:	29.66kHz								
		Delta 1	[T1]		RBW	30 k	Hz	RF Att	40	dВ	
Ref Lvl					VBW		Ηz				
10 dBm	10 dBm 829.65931864 kH				SWT	8.5 m	s	Unit		dBm	ı
10.						▼1	[T1]	-1	9.95	dBm	Z
				2				2.4797	8958	GHz	
0				Ā	_	<b>^</b> 1	[T1]	_	0.54	đВ	
				/ / /	$\sim$	70	[T1]	829.6593	1864	kHz	
-10				1		▼2		2.4800		dBm GHz	
			1 /	de la companya de la						0112	
-20 <del>-20.7</del>	<del>0 dBm</del>					<del>10 +</del>					
1MAX			- Jel			4					11
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		nest.				t	Į.				
-40							<u> </u>				
	<i></i>	للممار					N. Carrier				
-50 <b>bu</b>	J/						J.	J. T.			
S. D. Margar								VA.	kulikizaj	K <sub>IN</sub> III	
6.0										•	
-60											
-70											
-80											
-90	ļ				kHz/		_				ļ

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Product:		Blue	tooth Spea	ker	T	est Mode:		Keep tra	ınsmitt	ing	
Mode		Keepii	ng Transmi	tting	Te	est Voltage			3.7V		
Temperature			24 deg. C,	<del></del>		Humidity		56%	6 RH		
Test Result:			Pass			Detector		F	PK		
20dB Bandwidth		1	.152MHz								
r)		Delta 1	L [T1]		RBW	30 k	Hz R	F Att	40	dВ	
Ref Lvl				21 dB	VBW		Ηz				
10 dBm			L.115230	)46 MHz	SWT	8.5 m	s U	nit		dBm	Į.
10						<b>V</b> 1	[T1]	-1	9.90	dBm	L
					2			2.4016	1222	GHz	
0				_	Ā	<b>▲</b> <sup>1</sup>	[T1]		0.21	dВ	
				$  \wedge \rangle$	my f	_		1.1152		MHz	
-10			^	H V	+	<b>∇</b> 2	[T1]	-	0.95		
			1/\~	الم الم	\r	M / I		2.4022	9459	GHz	
-20 <u>-p1 -20.9</u>	5 dBm		<b>7</b>	ī		115					
1MAX			ļ				1				1
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-70											
-80											
	Ţ										
-90 Center 2.	402165	5331 GH	<b>L</b>	300	kHz/			Sp	an 3	MHz	ŀ

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Product:		Blue	tooth Spea	ker	T	est Mode:		Keep tra	nsmittin	g
Mode			ng Transmi			est Voltage			3.7V	
Temperature			24 deg. C,			Humidity			6 RH	
Test Result:			Pass			Detector			K	
OdB Bandwidth		1	.124MHz					-		
É		Delta 3	1 [T1]		RBW	30 k	Hz R	F Att	40 0	lВ
Ref Lvl					VBW		Ηz			
10 dBm	10 dBm 1.12424850				SWT	8.5 m	s U	nit	C	lBm
10.						<b>V</b> 1	[T1]	-19	.95 c	lBm
					2			2.44060	922 G	Ηz
0				Λ.		<b>^</b> 1	[T1]		.19 c	IB
					7	<b>V</b> 2	[T1]	1.12424		Hz
-10			Λ		<u> </u>	Λ <b>Λ</b>	[TI]	2.44130		lBm Hz
			1/ //	r de la companya della companya della companya de la companya della companya dell	Λα	4 / / 4				
-20 <u>-D1 20.6</u>	32 dBm		7			1/				-
1MAX			ļ			Ĭ	1			1
-30		<del>- [</del> \					<u> </u>			
-40		n F					-			
10	<sub>M</sub> .A	$\bigvee$					ph of	www.	-	
-50									<del>Mulve,</del>	ALC:
-60										_
-70										
-80										
-90										
Center 2.	441177	7355 GH	z	300	kHz/			Spa	an 3 M	Ηz

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Product:		Bluet	ooth Speal	ker		Test Mod	e:		Keep tra	ansmitt	ing	_
Mode			g Transmi		,	Test Volta	ge			23.7V		
Temperature			4 deg. C,			Humidit	y		569	% RH		
Test Result:			Pass			Detecto			]	PK		
OdB Bandwidth		1	.124MHz									
<u> </u>	Delta 1 [T1] ef Lvl 1.31				RBW	30	kH	z R	F Att	40	dВ	
Ref Lvl					VBW							
10 dBm		1	.124248	50 MHz	SWI	8.5	ms	U	nit		dBm	l
10.						_	1 [	T1]	-2	0.97	dBm	
					2				2.4796	0922	GHz	
0					Ā	_	1 [	T1]		1.31	dВ	
				تممر ہا 🏻	*	_			1.1242		MHz	
-10			Λ	<u> </u>		. ^	2 [	T1]	2.4803	0.95	dBm	
			$/ V_{\sim}$	per l	\^	///	1		2.4003		GIIZ	
-20 <del></del>	dBm		1									
1MAX		$-\lambda l$					Į.					1
-30		- <del>  V</del>					+					
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-50	Ņt .								<u> </u>	· Constitution	e 16.	
-50 Theresia											Vi	
-60												
-70												
-80												
-90 Center 2.4	902014	03 011-	7	300	kua/	_[	L		G	an 3	MII -	ļ

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Product:		Bluet	tooth Speal	ker		Τe	est Mode:		Keep tra	ınsmitt	ing	
Mode	ŀ		ng Transmi			Te	st Voltage			3.7V		
Temperature			4 deg. C,			F	Iumidity		56%	6 RH		
Test Result:			Pass				Detector		I	PK		
0dB Bandwidth		1	.163MHz									
	Delta 1				RB	W	30 k	Hz F	RF Att	40	dВ	
Ref Lvl			-0.		VB			Hz				
10 dBm		1	.163326	65 MHz	SW	T	8.5 m	s (	Jnit		dBm	i
							<b>V</b> 1	[T1]	-2	0.78	dBm	
				į į	2				2.4015	9419	GHz	ľ
0				r f			<u></u>	[T1]	_	0.17	đВ	
				$f(\lambda)$	$\mathcal{I}$		<b>V</b> 2		1.1633	2665	MHz	
-10			~	<del>-   VE</del> -	1	1	Λ Λ	[ + + ]	2.4021			
				endered.	1	7	, v /					
-20 <del></del>	dBm		<del>/ \</del> \			+		•				
1MAX		1	ľ									1.1
-30		#						<u> </u>				
		1						1				
-50	Mu	Į.						M.				
-20 HOWATON	4								100	delid	And.	
-60										1		
-70												
-80												
-90												
Center 2.4	0216533	1 GH:	z	300	kHz/				Sp	an 3	MHz	r

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8QPSK Modula	ation									
Product:			tooth Spea		T	est Mode:		Keep tra	nsmitting	
Mode			ig Transmi	tting	Te	est Voltage		DC	3.7V	
Temperature		2	4 deg. C,			Humidity		56%	6 RH	
Test Result:			Pass		-	Detector		F	PK	
20dB Bandwidth			.154MHz							
		Delta 1			RBW					
~	Ref Lvl 10 dBm			01 dB	VBW		kHz ms Unit			
10 dBm			.154308	862 MHz	SWT	8.5 m	S	Unit	dBm	1
10						<b>▼</b> 1	[T1]	-1	9.05 dBm	A
				2				2.4405	9719 GHz	
0				A /		<b>^</b> 1	[T1]	_	0.01 dB	
				$A \setminus A$	~	<b>V</b> 2		1.1543		
-10				- X	1	Λ Λ	[T1]	2.4411	0.57 dBm 7435 GHz	
-20 <u>D1 20 5</u>	7 dBm			لممم	\ <u>^</u>	V \		2.4411	7433 GHZ	
1MAX	, abiii	1								1MA
-30										
-40	/	w/					A	in the same		
-50	G.								San Will	i
-60										
-70										
-80										
-90 Center 2.	Center 2.441177355 GHz			300	kHz/			Sp	an 3 MHz	
ate: 12.	JAN.20		:36:32							

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8QPSK Modul	lation									
Product:		Bluet	tooth Spea	ker	-	Test Mode:		Keep tra	nsmitting	
Mode		Keepir	ıg Transmi	tting	Г	est Voltage	;	DC.	3.7V	
Temperature		2	4 deg. C,			Humidity		56%	6 RH	
Test Result:			Pass			Detector		P	K	
20dB Bandwidth			.160MHz						-	
		Delta 1		10 15	RBW	30 k		RF Att	40 dB	
Ref Lvl		1	-0. 160320.	19 dB	VBW SWT	100 k 8.5 m	Hz	Unit	dBm	1
10					21		1	1	1	
				2		▼1	[T1]	-1: 2.47959	9.91 dBm 9719 GHz	A
0				- Ā		<b>^</b> 1	[T1]	- (	.19 dB	
				$1 MJ^{*}$	7	▼2		1.16032		
-10		]	$\overline{A}$		$\overline{}$		[T1]	2.4801	0.84 dBm 7435 GHz	
-20 <del>120</del> .6	<del>34 dBm</del>				•	Ī				
1MAX -30						-				1MA
-40	_					ĺ	<u> </u>			
	1 hours	r					ph Car	$\Lambda$		
-50	<del>V</del>							- Toronto	weep of the	
-60										
-70										
-80										
-90 Center 2.	Center 2 480201403 GHz 300			300	kHz/			Spa	an 3 MHz	
	Center 2.480201403 GHz				•			- 1-		

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Date: 2021-01-14

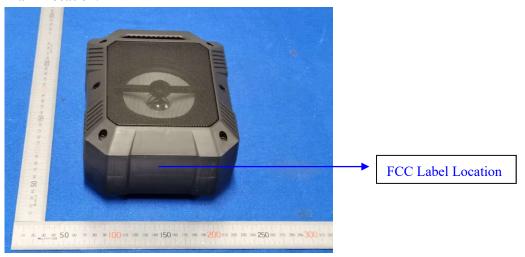


#### 10.0 FCC ID Label

#### FCC ID: 2ACCE-BT902

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

# Mark Location:



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#### 11.0 Photo of testing

#### 11.1 Conducted test View--



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#### Radiated emission test view



The report refers only to the sample tested and does not apply to the bulk.

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#### 11.2 Photographs – EUT

#### Outside View





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# Photographs – EUT

#### Outside View





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Outside View





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Inside view



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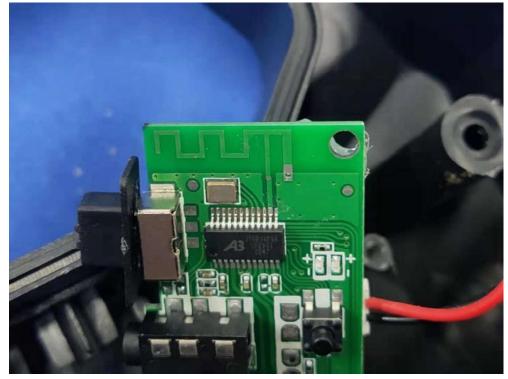
Report No.: TW2012404E

Date: 2021-01-14



Inside view





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Inside view



-- End of the report--