

FCC Part 15C

Measurement and Test Report

For

Dolphin Electronics Co., Ltd

**Building 8, Fuqiao No.3 Industrial Zone, Fuyong Baoan District, Shenzhen,
China**

FCC ID: 2AHWMTB-BTS25

FCC Rule(s): FCC Part 15C

Product Description: Bluetooth clock speaker

Tested Model: TB-BTS25

Report No.: STR16038262I-1

Tested Date: 2016-03-30 to 2016-04-09

Issued Date: 2016-04-09

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Dolphin Electronics Co., Ltd
Address of applicant: Building 8, Fuqiao No.3 Industrial Zone, Fuyong
Baoan District, Shenzhen, China
Manufacturer: Dolphin Electronics Co., Ltd
Address of manufacturer: Building 8, Fuqiao No.3 Industrial Zone, Fuyong
Baoan District, Shenzhen, China

General Description of EUT

Product Name:	Bluetooth clock speaker
Trade Name:	/
Model No.:	TB-BTS25
Adding Model(s):	/

Note: The test data is gathered from a production sample, provided by the manufacturer.

Technical Characteristics of EUT

Frequency Range:	112~205KHz
Rated Voltage:	DC 5V (Wireless output)
Rated Current:	1A (Wireless output)
Rated Power:	5W (Wireless output)

1.2 Test Standards

The following report is prepared on behalf of the Dolphin Electronics Co., Ltd in accordance with Part 2, Subpart J, and FCC Part 15, Subpart B, Subpart C, and section 15.203, 15.205 and 15.209 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.207, and 15.209 rules.

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

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. 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 and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging	With load
TM2	Charging	With mobile phone

Note: Test was performed with TM1 and TM2, TM1 is the worst case so it is only showed in this report.

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
AUX Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Mobile Phone	SAMSUNG	SM-920V	/
Adapter	Apple	A1357	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.207 (a) Conducted Emission	Compliant
§15.209(a) Radiated Emission	Compliant

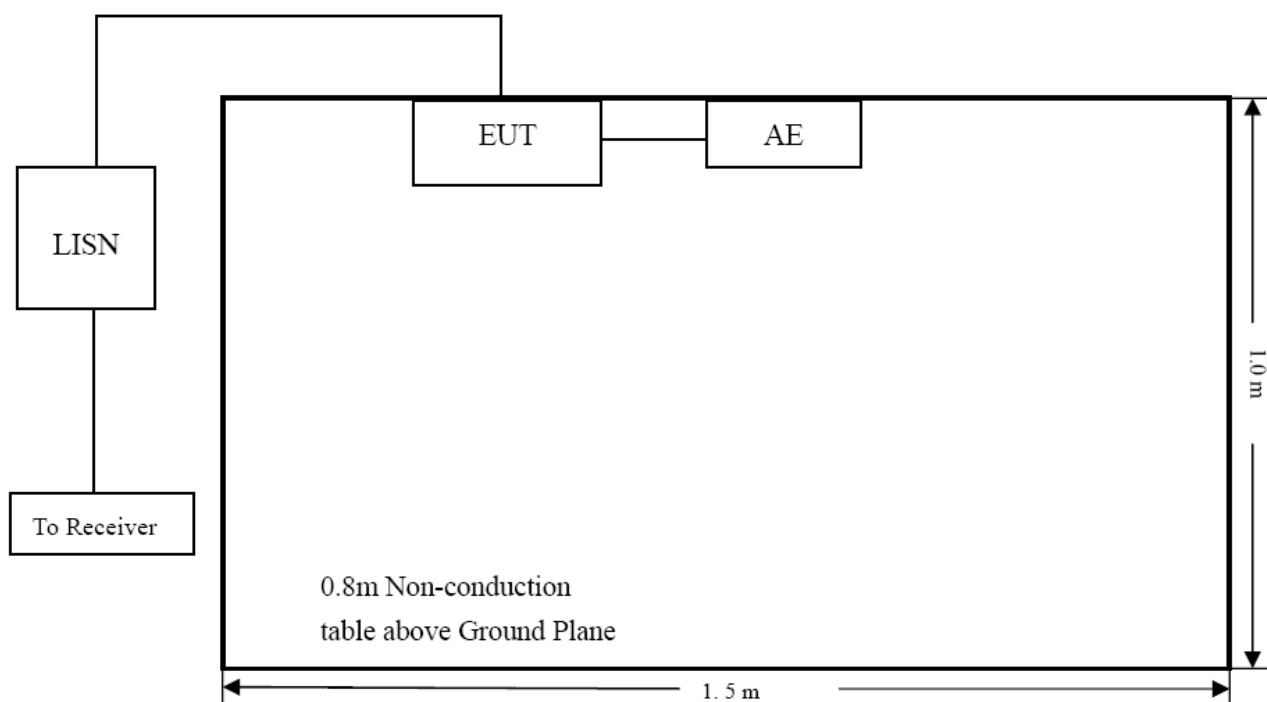
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results/Plots

According to the data in section 3.5, the EUT complied with the FCC Part 15.207(a) Conducted margin for this device, with the *worst* margin reading of:

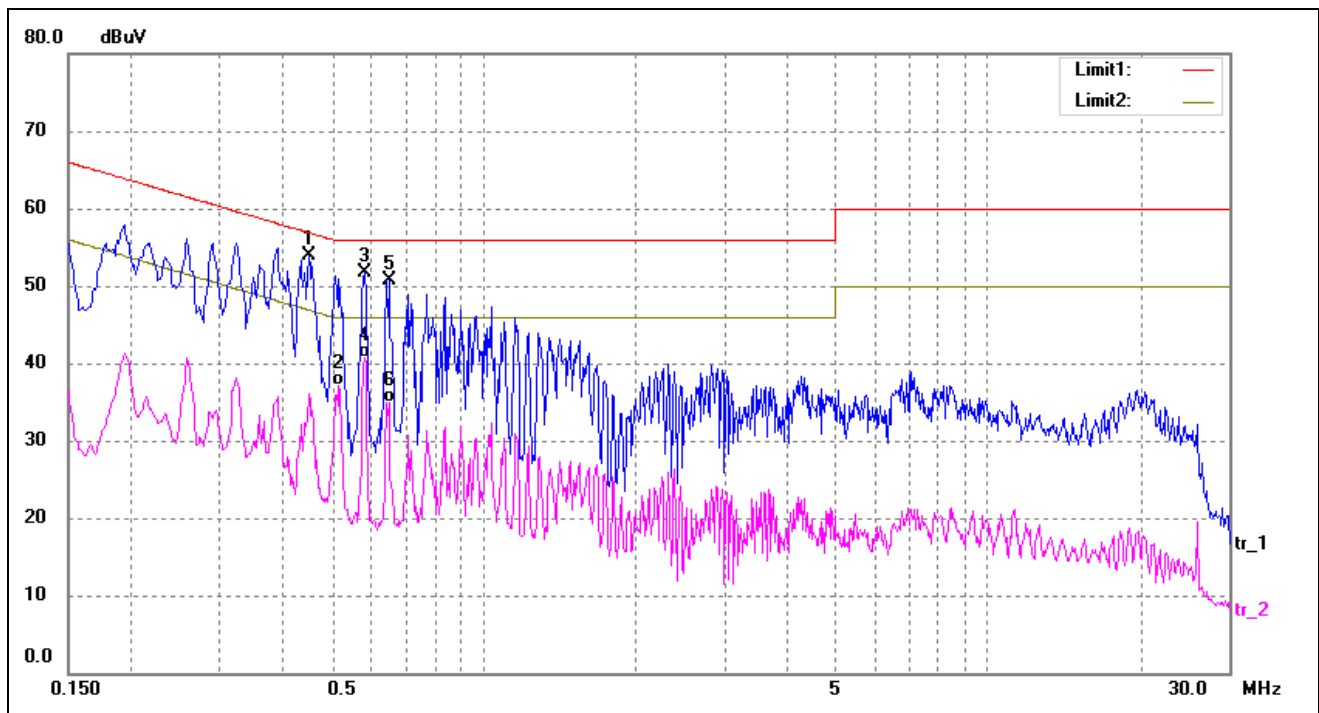
-3.03 dB at 0.4500 MHz in the **Neutral, Peak** detector, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

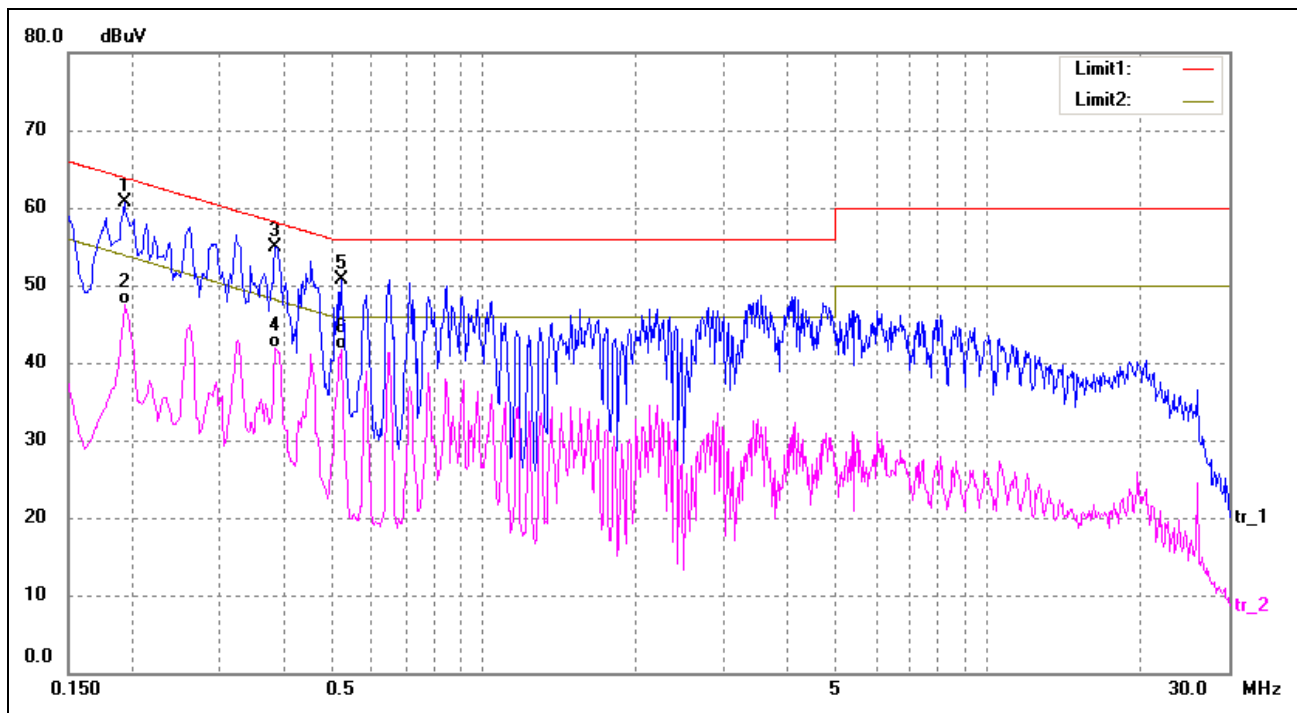
EUT: Bluetooth clock speaker
 Tested Model: TB-BTS25
 Operating Condition: TM1
 Comment: 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.4500	44.31	9.53	53.84	56.87	-3.03	peak
2	0.5180	27.45	9.56	37.01	46.00	-8.99	AVG
3	0.5819	42.22	9.58	51.80	56.00	-4.20	peak
4	0.5819	31.17	9.58	40.75	46.00	-5.25	AVG
5	0.6500	41.05	9.60	50.65	56.00	-5.35	peak
6	0.6500	25.36	9.60	34.96	46.00	-11.04	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1940	51.27	9.50	60.77	63.86	-3.09	peak
2	0.1940	38.09	9.50	47.59	53.86	-6.27	AVG
3	0.3860	45.47	9.50	54.97	58.15	-3.18	peak
4	0.3860	32.36	9.50	41.86	48.15	-6.29	AVG
5	0.5220	41.16	9.57	50.73	56.00	-5.27	peak
6	0.5220	32.06	9.57	41.63	46.00	-4.37	AVG

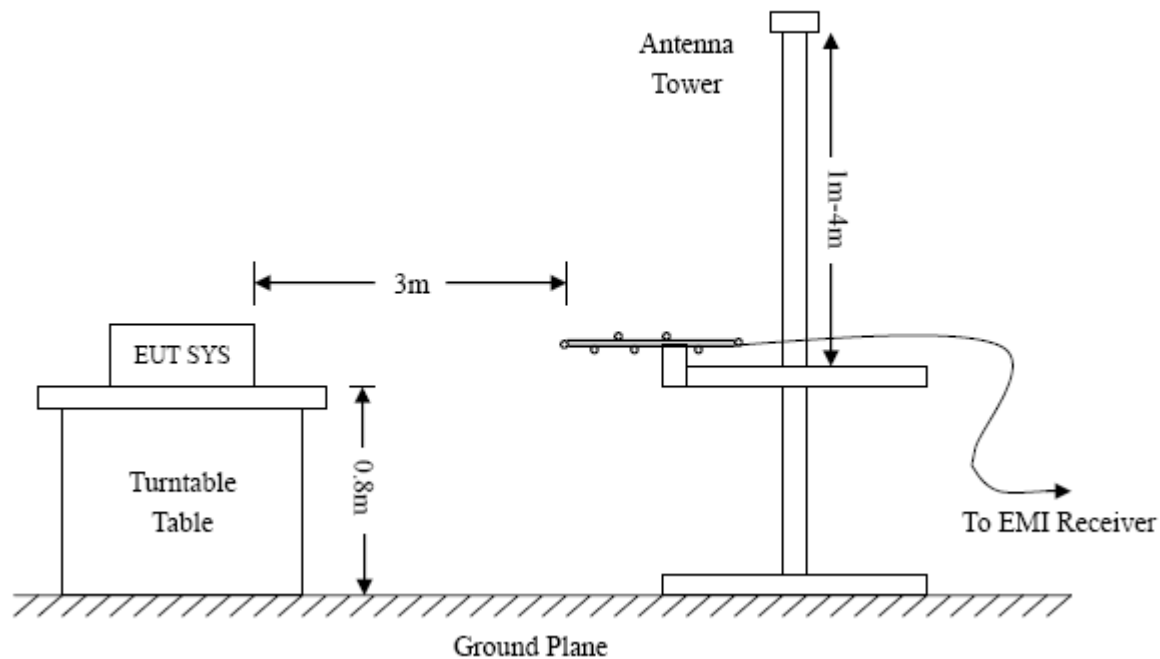
4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for this device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.209(a) Limit}$$

4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.209(a) rule, and had the worst margin of:

-2.86 dB at 37.3509 MHz in the Vertical polarization, 9 KHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data(Below 30MHz)

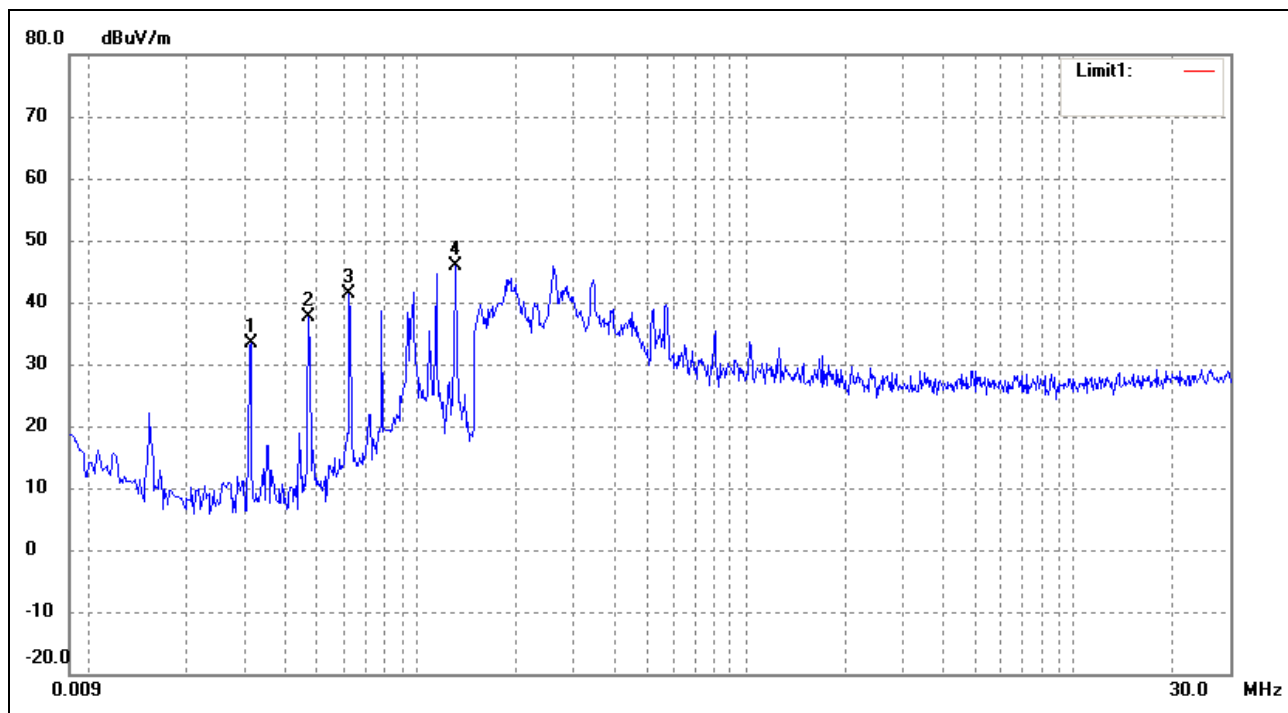
EUT: Bluetooth clock speaker

Tested Model: TB-BTS25

Operating Condition: TM1

Comment: 120V/60Hz; Adapter DC 5V

Test Specification: Loop Antenna

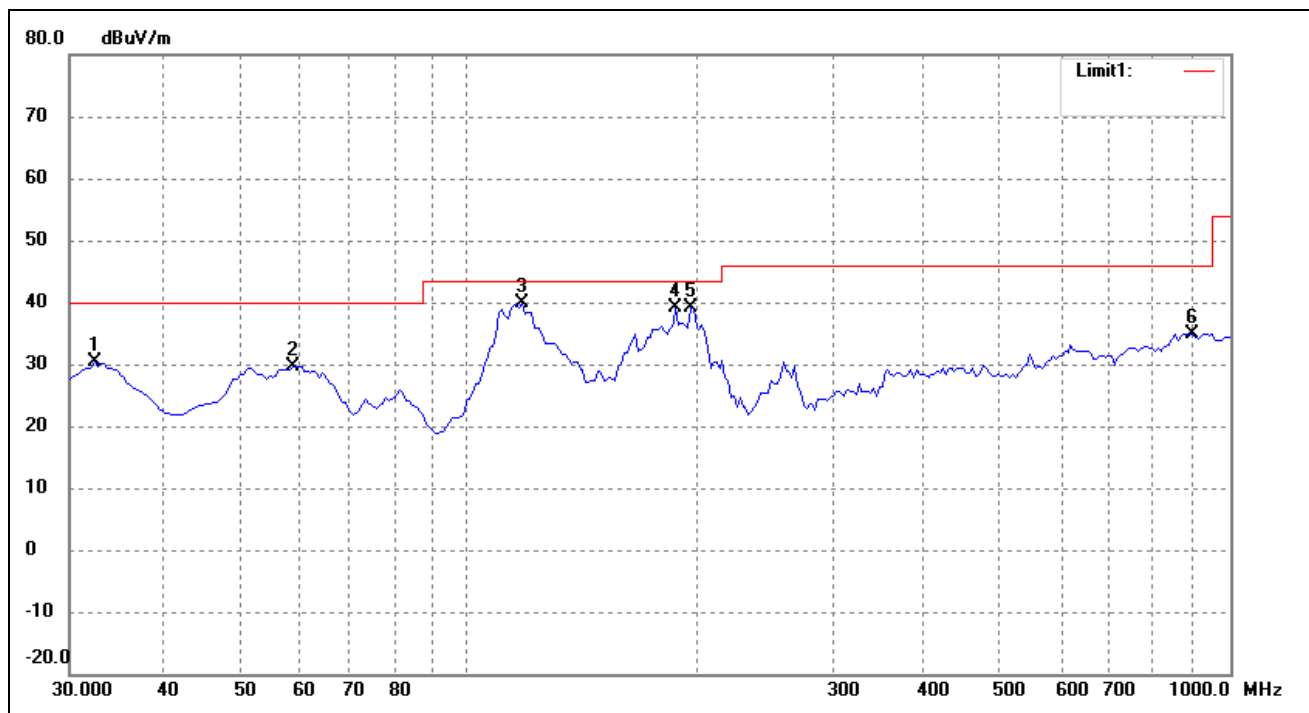


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	0.0313	13.61	19.87	33.48	77.72	-44.24	74	100	peak
2	0.0468	17.76	19.83	37.59	74.18	-36.59	90	100	peak
3	0.0625	21.60	19.79	41.39	71.69	-30.30	138	100	peak
4	0.1313	26.22	19.67	45.89	65.33	-19.44	196	100	peak

Plot of Radiated Emissions Test Data (From 30MHz to 1GHz)

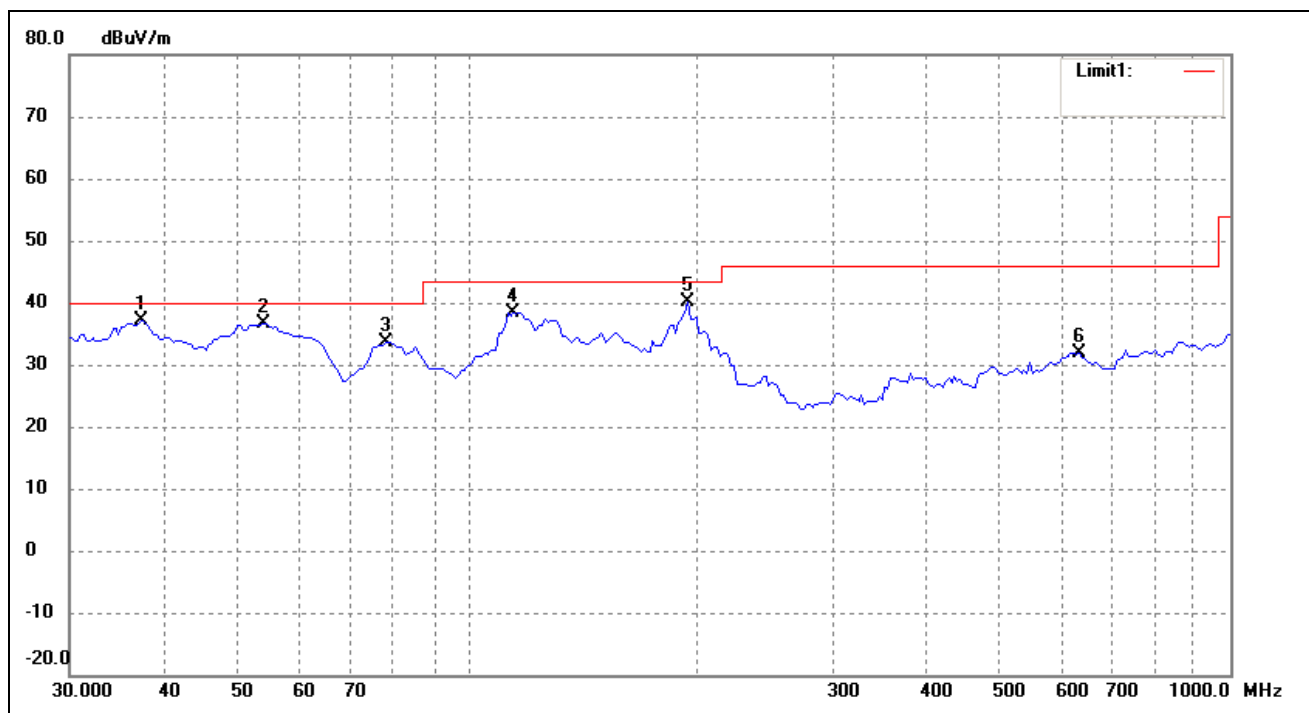
EUT: Bluetooth clock speaker
 Tested Model: TB-BTS25
 Operating Condition: TM1
 Comment: 120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4628	40.02	-9.68	30.34	40.00	-9.66	34	100	peak
2	59.1000	39.13	-9.46	29.67	40.00	-10.33	79	100	peak
3	117.7724	51.16	-11.37	39.79	43.50	-3.71	123	100	peak
4	187.6250	49.49	-10.33	39.16	43.50	-4.34	168	100	peak
5	197.3249	48.21	-9.01	39.20	43.50	-4.30	192	100	peak
6	898.1499	31.82	3.15	34.97	46.00	-11.03	224	100	peak

Test Specification: Vertical



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