



CE-EMC Test Report

Applicant: JuChin Electronic Co.,Ltd.

Product Description: BT Speaker

Tested Model: BT-800

Test Standards: EN 301489-1 V1.9.2 (2011-09)
EN 301489-17 V2.2.1 (2012-09)

Report No.: JQL161129882-1E

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The test results in this report apply exclusively to the tested model / sample. Without written approval of Shenzhen Jialian Testing Consulting Co., Ltd., the test report shall not be reproduced except in full.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: JuChin Electronic Co.,Ltd.
Address of applicant: Industrial Park, Anfu County, Jian City, Jiangxi Province, China

Manufacturer: JuChin Electronic Co.,Ltd.
Address of manufacturer: Industrial Park, Anfu County, Jian City, Jiangxi Province, China

General Description of EUT

Product Name:	BT Speaker
Trade Name:	N/A
Model No.:	BT-800
Adding Model(s):	CNS-CBTSP3, BT-3007, CNS-CBTSP2
Rated Voltage:	Battery 3.7V, DC 5V (Charging)

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

Technical Characteristics of EUT

Bluetooth Version:	Bluetooth V2.1
Frequency Range:	2402-2480MHz
RF Output Power:	4.04dBm(EIRP)
Type of Modulation:	GFSK, Pi/4 DQPSK, 8DPSK
Data Rate:	1Mbps, 2Mbps, 3Mbps
Quantity of Channels	79
Channel Separation:	1MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0dBi



1.2 Test Standards

The following report is prepared on behalf of the JuChin Electronic Co.,ltd. in accordance with ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements and ETSI EN301 489-17, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment.

The objective of the manufacturer is to demonstrate compliance with the standards ETSI EN 301489-1 and ETSI EN301 489-17.

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

1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

1.4 Test Facility

CNAS Registration No.: L0579

Shenzhen Academy of Metrology and Quality Inspection is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L0579. All measurement facilities used to collect the measurement data are located at Metrology and Quality Inspection Building,Central Section of LongZhu Road, Nanshan District, Shenzhen (518055)



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	Operating	BT Link&USB input for charging

EUT Cable List and Details

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

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

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



1.6 Performance Criteria for EMS

According Clause 6.1 of EN 301 489-17, the performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

Table 1: Performance criteria

Criteria	During test	After test
A	Shall operate as intended May show degradation of performance (note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance (note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (note 2) Shall be no loss of stored data or user programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance (note 2)
<p>NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p> <p>NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p>		



2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
EN 301489-1 V1.9.2 (2011-09)	8.2	Radiated Emissions	Passed
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Passed
	8.5	Harmonic Current Emissions	Passed
	8.6	Voltage Fluctuations and Flicker	Passed
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Passed
	9.3	Electron static Discharge	Passed
	9.4	Fast Transients, Common Mode	Passed
	9.5	Radio Frequency, Common Mode	Passed
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Passed
	9.8	Surges	Passed
<p>Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirments in the standard N/A: not applicable</p>			



3. Conducted Emissions

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

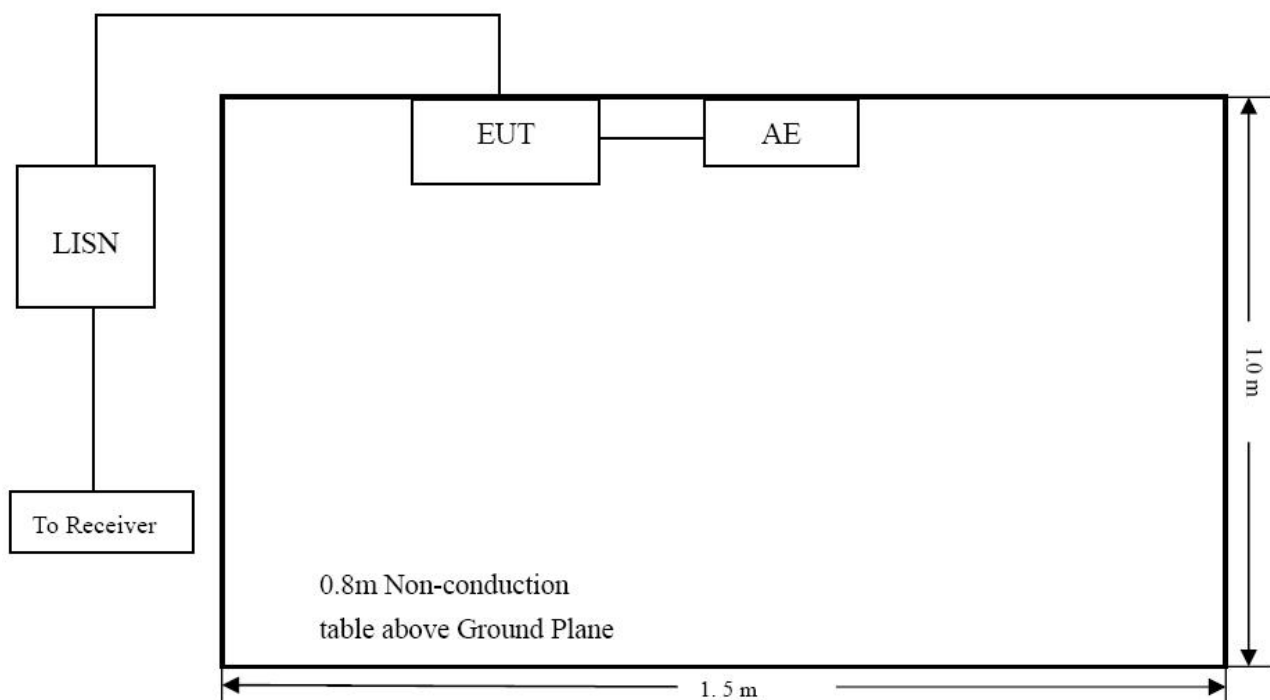
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101672	2016-07-01	2017-06-30
L.I.S.N	Schwarz beck	NSLK8126	8126-244	2016-07-01	2017-06-30

3.3 Test Procedure

Test is conducting under the description of EN55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.4 Basic Test Setup Block Diagram





3.5 Environmental Conditions

Temperature:	22 ° C
Relative Humidity:	55 %
ATM Pressure:	1015 mbar

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the EN 301489 Conducted margin for a Class B device, with the *worst* margin reading of:

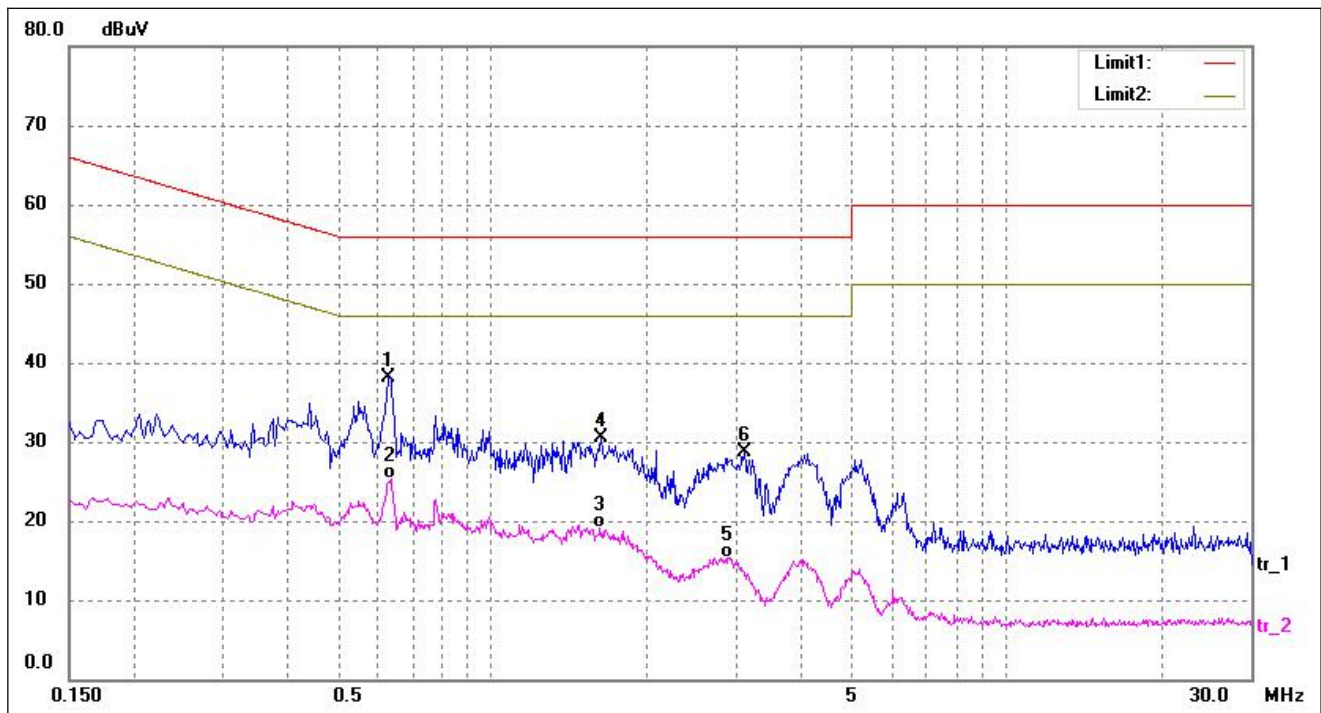
-6.81 dB at 1.9860 MHz in the Neutral Mode, Average detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

**Plot of Conducted Emissions Test Data**

EUT: BT Speaker
Tested Model: BT800
Operating Condition: TMI
Comment: USB Charging

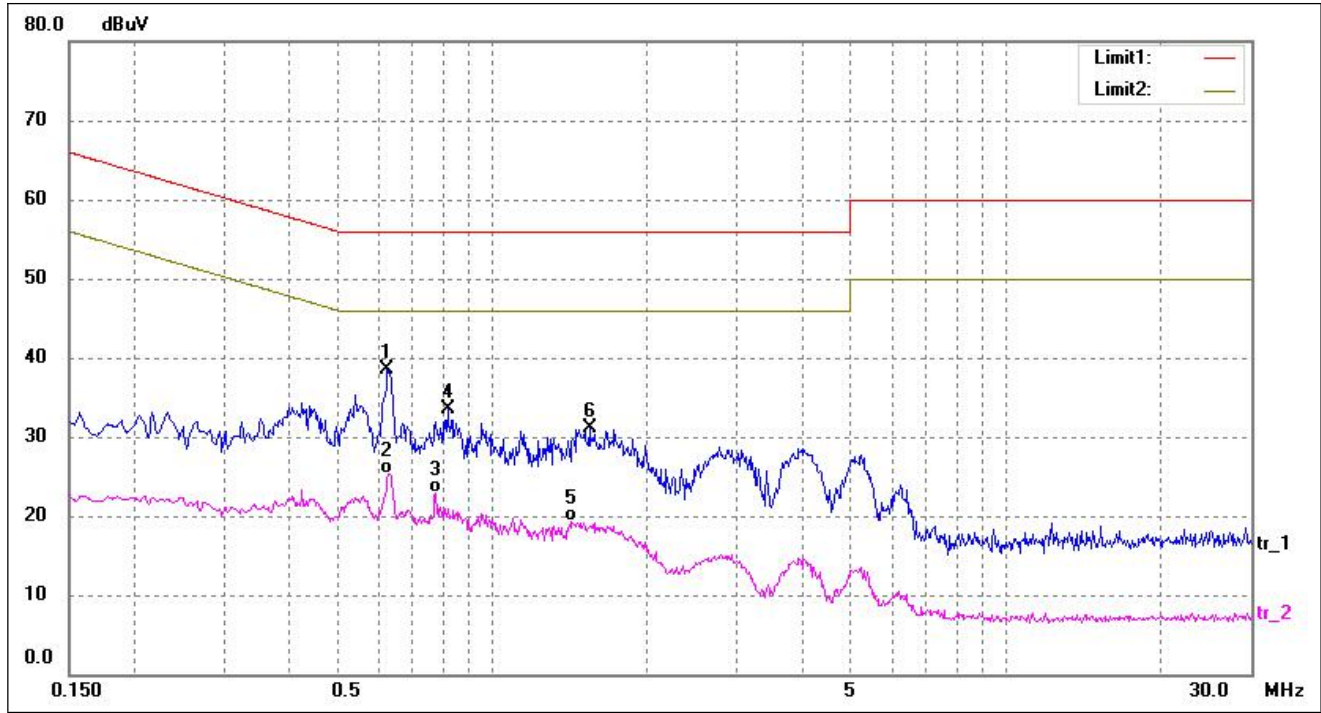
Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.6300	28.37	9.79	38.16	56.00	-17.84	peak
2	0.6340	15.59	9.79	25.38	46.00	-20.62	AVG
3	1.6260	9.29	9.74	19.03	46.00	-26.97	AVG
4	1.6300	20.69	9.74	30.43	56.00	-25.57	peak
5	2.8940	5.64	9.71	15.35	46.00	-30.65	AVG
6	3.1060	18.96	9.71	28.67	56.00	-27.33	peak



Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.6260	28.62	9.79	38.41	56.00	-17.59	peak
2	0.6300	15.44	9.79	25.23	46.00	-20.77	AVG
3	0.7780	13.06	9.78	22.84	46.00	-23.16	AVG
4	0.8180	23.71	9.77	33.48	56.00	-22.52	peak
5	1.4300	9.57	9.75	19.32	46.00	-26.68	AVG
6	1.5500	21.27	9.75	31.02	56.00	-24.98	peak



4. Radiated Emissions

4.1 Measurement Uncertainty

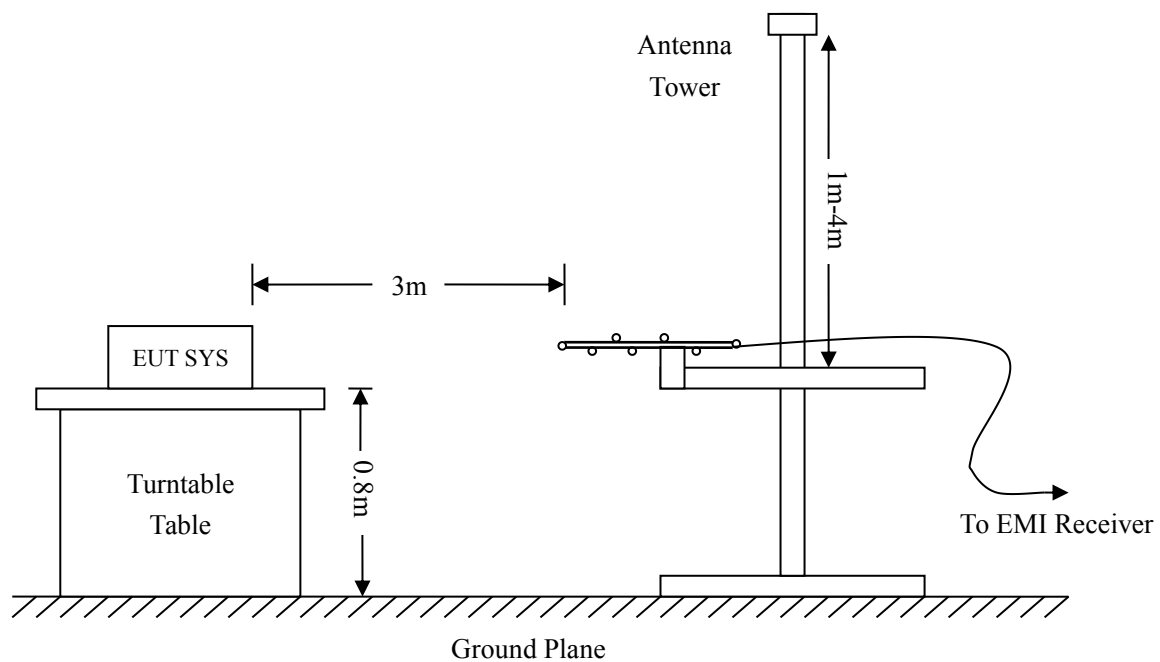
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/032	2016-07-01	2017-06-30
EMI Test Receiver	R&S	ESVB	825471/011	2016-07-01	2017-06-30
Pre-amplifier	Compliance Direction	PAP-0118	24004	2016-07-01	2017-06-30
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-352	2016-07-01	2017-06-30
Horn Antenna	ETS	3117	00086213	2016-07-01	2017-06-30

4.3 Test Procedure

Test is conducting under the description of EN55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.





4.4 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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 Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$

4.5 Environmental Conditions

Temperature:	23° C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

4.6 Summary of Test Results/Plots

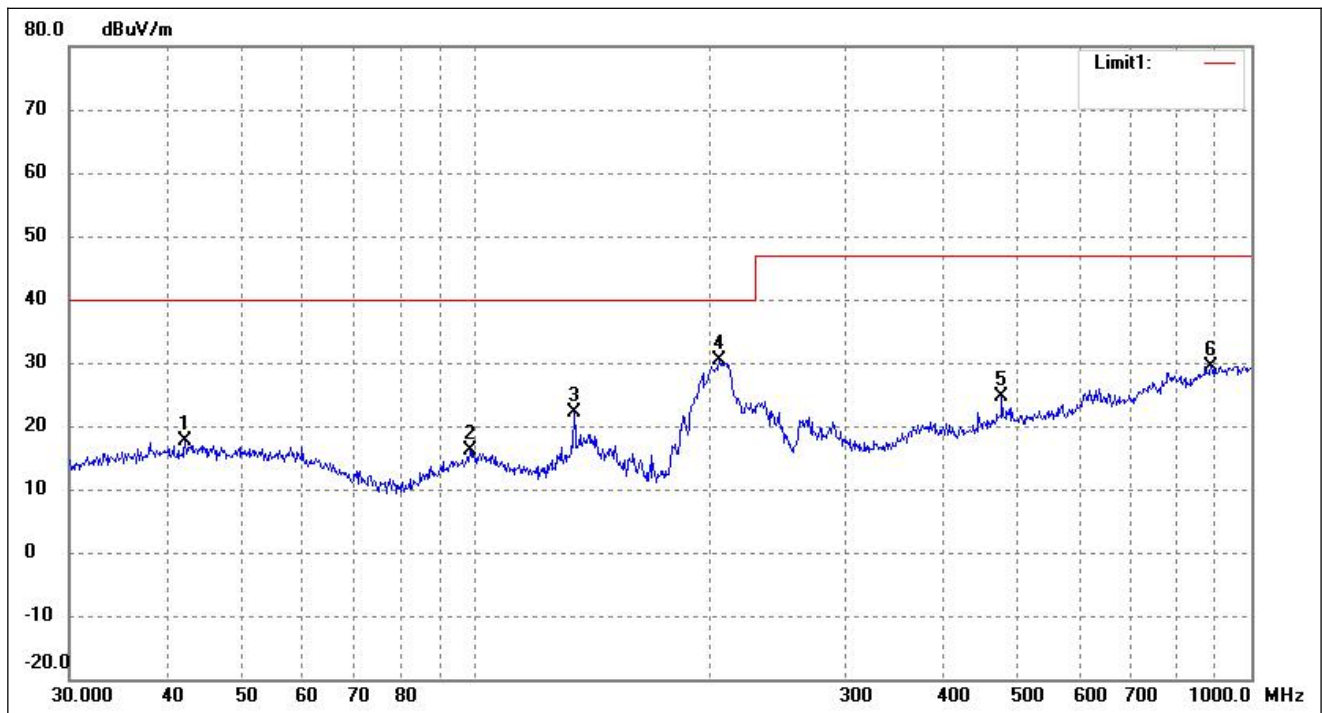
According to the data in section 4.6, the EUT complied with the EN 301489 Class B standards, and had the worst margin is:

-9.74 dB at 206.3976 MHz in the Horizontal polarization, 30 MHz to 6 GHz, 3Meters

**Plot of Radiated Emissions Test Data**

EUT: BT Speaker
Tested Model: BT800
Operating Condition: TM1
Comment: USB Charging

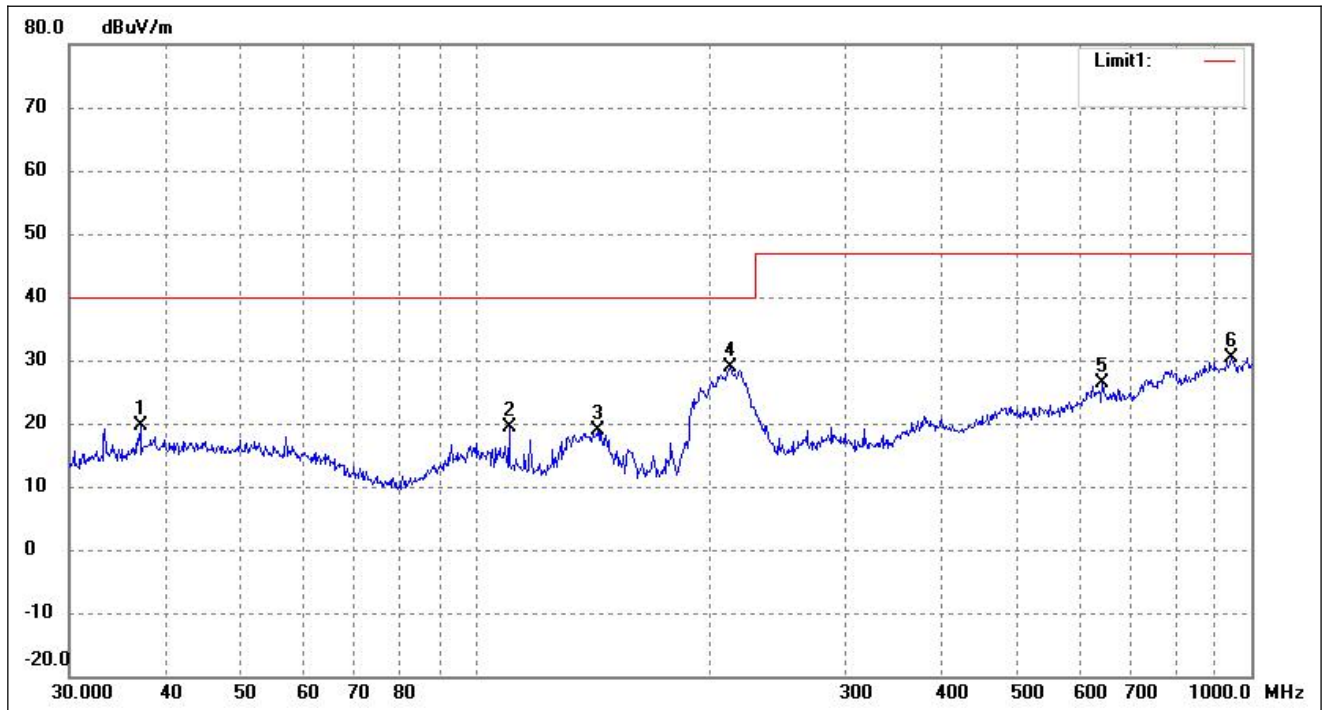
Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.3022	28.17	-10.49	17.68	40.00	-22.32	0	100	peak
2	98.4866	27.89	-11.73	16.16	40.00	-23.84	0	100	peak
3	134.0882	36.63	-14.48	22.15	40.00	-17.85	0	100	peak
4	206.3976	42.14	-11.88	30.26	40.00	-9.74	0	100	peak
5	477.1694	30.22	-5.55	24.67	47.00	-22.33	0	100	peak
6	887.6099	28.05	1.45	29.50	47.00	-17.50	0	100	peak



Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	37.0249	30.82	-11.09	19.73	40.00	-20.27	0	100	peak
2	110.5687	32.06	-12.61	19.45	40.00	-20.55	0	100	peak
3	143.8295	33.81	-14.86	18.95	40.00	-21.05	0	100	peak
4	213.0151	40.94	-12.17	28.77	40.00	-11.23	0	100	peak
5	642.8613	29.56	-3.27	26.29	47.00	-20.71	0	100	peak
6	942.1305	28.24	2.21	30.45	47.00	-16.55	0	100	peak

Emissions 1 - 6 GHz

During measurements from 1 GHz to 6 GHz, only base noise was detected.



5. Harmonic Current Emissions

5.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Digital Power Analyzer	California Instrument	CTS	72831	2016-07-01	2017-06-30
Power Source	California Instrument	5001IX-CTS-400	60077	2016-07-01	2017-06-30

5.2 Test Procedure

Test is conducting under the description of EN61000-3-2.

5.3 Test Standards

EN61000-3-2, Clause 7.1 Limits for Class A equipment.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1022 mbar

5.4 Harmonic Current Emissions Test Data

According to Clause 7 of EN61000-3-2, the EUT is less than 75W, belong to 'equipment with a rated power of 75W or less', therefore 'limits are not specified in this edition of the standards'. It is deem to full fit the requirements of the standards.

Result: The EUT is compliance with the requirements of this section.



6. Voltage Fluctuation and Flicker

6.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Digital Power Analyzer	California Instrument	CTS	72831	2016-07-01	2017-06-30
Power Source	California Instrument	5001IX-CTS-400	60077	2016-07-01	2017-06-30

6.2 Test Procedure

Test is conducting under the description of EN61000-3-3.

6.3 Test Standards

EN61000-3-3, Limit: Clause 5.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1022 mbar

6.4 Voltage Fluctuation and Flicker Test Data

According to clause 6.1 of EN 61000-3-3, “Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker.”

Result: The EUT is compliance with the requirements of this section.



7. Electrostatic Discharge (ESD)

7.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
ESD Generator	TESQ AG	NSG 437	166	2016-07-01	2017-06-30

7.2 Test Procedure

Test is conducting under the description of IEC61000-4-2.

Test Performance

Performance Criterion: B for TT, TR

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

7.3 Electrostatic Discharge Immunity Test Data

Operating Condition: TM1

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Slots	A	A	A	A	A	A	B	B
Buttons	A	A	A	A	A	A	B	B
Direct Contact Discharge								
USB Port	A	A	A	A	--	--	--	--
Metal Part	A	A	A	A				

Test Result: Pass



8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Signal Generator	Rohde & Schwarz	SMT03	100059	2016-07-01	2017-06-30
Voltage Probe	Rohde & Schwarz	URV5-Z2	100013	2016-07-01	2017-06-30
Power Amplifier	AR	150W1000	300999	2016-07-01	2017-06-30
Power Amplifier	AR	25S1G4AM1	305993	2016-07-01	2017-06-30
Trilog Antenna	SCHWARZBECK	VULB9163	9163-333	2016-07-01	2017-06-30
Anechoic chamber	Albatross Projects	MCDC	----	2016-07-01	2017-06-30

8.2 Test Procedure

Test is conducting under the description of IEC61000-4-3.

Test Performance

Performance Criterion: A for CT, CR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1010 mbar

8.3 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth

Operating Condition: TM1

Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1400-2700	3	A	A	A	A	A	A	A	A

Test Result: Pass



9. Fast Transients, Common Mode (EFT)

9.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	765	2016-07-01	2017-06-30

9.2 Test Procedure

Test is conducting under the description of IEC61000-4-4.

Test Performance

Performance Criterion: B for TT, TR

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

9.3 Electrical Fast Transients Test Data

Operating Condition: TMI

EN 61000-4-4		Test Levels (kV)							
Test Points		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
Power Supply Power Port of EUT	L1	A	A	B	B	/	/	/	/
	L2	A	A	B	B	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L1+L2	A	A	B	B	/	/	/	/
	L1 + PE	/	/	/	/	/	/	/	/
	L2 + PE	/	/	/	/	/	/	/	/
	L1+L2+PE	/	/	/	/	/	/	/	/
Signal ports		/	/	/	/	/	/	/	/

Test Result: Pass



10. Surges

10.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	765	2016-07-01	2017-06-30

10.2 Test Procedure

Test is conducting under the description of IEC 61000-4-5.

Test Performance

Performance Criterion: B for TT, TR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

10.3 Surge Test Data

Operating Condition: TM1

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	A	/
2	1kV	±	L-N	A	/
3	2kV	±	L-PE, N-PE	/	/
4	4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass



11. Radio Frequency, Common Mode (C/S)

11.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
CS Immunity Tester	EMTEST	CWS500	0900-01	2016-07-01	2017-06-30

11.2 Test Procedure

Test is conducting under the description of IEC 61000-4-6.

Test Performance

Performance Criterion: A for CT, CR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

11.3 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Operating Condition: TM1

Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Result: Pass



12. Voltage Dips and Interruptions

12.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	765	2016-07-01	2017-06-30

12.2 Test Procedure

Test is conducting under the description of IEC 61000-4-11.

Test Performance

Performance Criterion: B/C

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

12.3 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U_T (U_T is rated voltage for the EUT)

T: Test duration

Operating Condition: TM1

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	A	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	C	/

Test Result: Pass



EXHIBIT A - LABEL

Label Information

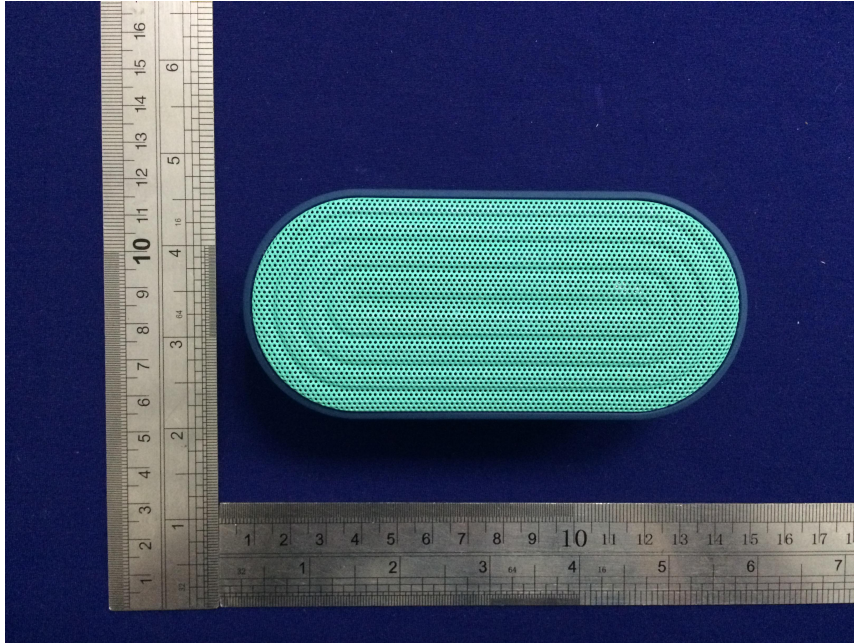


Remark: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. The 'CE' marking must be affixed to the EUT or to its data plate. Where this is not possible or not warranted on account of the nature of the apparatus, it must be affixed to the packaging, if any, and to the accompanying documents. The 'CE' marking must have a height of at least 5 mm. If the 'CE' marking is reduced or enlarged the proportions given in the above graduated drawing must be respected.



EXHIBIT B - EUT PHOTOS

EUT View 1



EUT View 2





EUT View 3



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