

# TEST REPORT

**FCC ID: 2AEZ4BM020**

**Product: Bluetooth Speaker**

**Model No.: BM020**

**Trade mark: JOWAY.**

**Report No.: TCT150810E009**

**Issued Date: Aug. 14, 2015**

Issued for:

**Shenzhen Joway Power Supply Co., Ltd.  
Bldg.D. Dejin Industrial Park Second Zone, Fuyuan 1st Rd., Fuyong Town,  
Bao'an District, Shenzhen, China**

Issued By:

**Shenzhen Tongce Testing Lab  
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## 1. Test Certification

<b>Product:</b>	Bluetooth Speaker
<b>Model No.:</b>	BM020
<b>Applicant:</b>	Shenzhen Joway Power Supply Co., Ltd.
<b>Address:</b>	Bldg.D. Dejin Industrial Park Second Zone, Fuyuan 1st Rd., Fuyong Town, Bao'an District, Shenzhen, China
<b>Manufacturer:</b>	Shenzhen Joway Power Supply Co., Ltd.
<b>Address:</b>	Bldg.D. Dejin Industrial Park Second Zone, Fuyuan 1st Rd., Fuyong Town, Bao'an District, Shenzhen, China
<b>Test Voltage:</b>	AC 120V/60 Hz
<b>Date of Test:</b>	Aug. 10 – Aug. 13, 2015
<b>Applicable Standards:</b>	47 CFR FCC Part 15 Subpart B: 2014 ANSI C63.4: 2014

The above equipment has been tested by Shenzhen Tongce Testing Lab and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Derek Cai

Derek Cai

Date: Aug. 14, 2015Check By: Davis Zhou

Davis Zhou

Date: Aug. 14, 2015

Approved By: \_\_\_\_\_

Tomsin

Date: Aug. 14, 2015

## 2. Test Result Summary

Emission		
Test Method	Item	Result
FCC 47 CFR Part 15 Subpart B	Conducted Emission at Mains Terminals	Pass
	Radiated Emission	Pass

**Note:**

1. Pass: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.
5. The information of measurement uncertainty is available upon the customer's request.

### 3. EUT Description

<b>Product Name:</b>	Bluetooth Speaker
<b>Model No.:</b>	BM020
<b>Product Parameter:</b>	Rechargeable Li-ion Battery DC 3.7V
<b>AC Line(PC):</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1.2 m
<b>AC Line(Monitor):</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1.2 m
<b>AC Line(Printer):</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1.2 m
<b>VGA Line</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1.0 m
<b>USB Line(EUT to PC)</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 0.8 m
<b>USB Line (Printer to PC)</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1 m
<b>USB Line(Mouse)</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1 m
<b>USB Line(Keyboard)</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 1 m
<b>AUX In Line:</b>	<input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 0.8 m

## 4. Test Methodology

### 4.1. Decision of Final Test Mode

The EUT was tested together with the thereafter additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The following test mode(s) were assessed:

Test Mode
Mode 1: Charging + AUX In
Mode 2: Data Transmitting
Mode 3: Charging + BT Playing
Mode 4: Charging + FM Playing

The following test mode was found to produce the highest emission level.

The Worst Test Mode		
Emission	Conducted Emission	Mode 2: Data Transmitting
	Radiated Emission	Mode 2: Data Transmitting

### 4.2. EUT System Operation

1. Set up EUT with the support equipments.
2. Make sure the EUT work normally during the test.

## 5. Setup of Equipment under Test

### 5.1. Description of Support Units

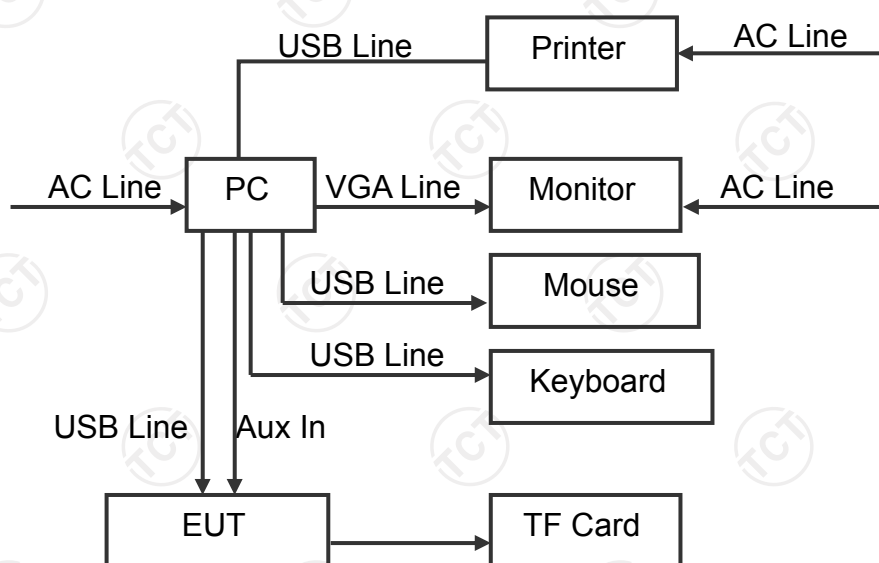
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
PC	BM6620	D1PFCG0008HP	DOC	ASUS
Monitor	VX239	VX239H	DOC	ASUS
Keyboard	PK1100U	04G104180039DP	DOC	ASUS
Mouse	MOBTUO	04G125610170DP	DOC	ASUS
Printer	L11121E	MQCA712843	DOC	Canon
TF Card	C08G	/	DOC	Kingston

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

### 5.2. Configuration of System Under Test



(EUT: Bluetooth Speaker)

## 6. Facilities and Accreditations

### 6.1. Facilities

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

- FCC - Registration No.: 572331

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- CNAS - Registration No.: CNAS L6165

Shenzhen TCT Testing Technology Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6165.

### 6.2. Location

Shenzhen Tongce Testing Lab

Address: 1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

Tel: 86-755-36638142

### 6.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$



## 7. Emission Test

### 7.1. Conducted Emission at Mains Terminals

#### 7.1.1. Test Specification

<b>Test Requirement:</b>	FCC 47 CFR Part 15 Subpart B
<b>Test Method:</b>	ANSI C63.4:2014
<b>Frequency Range:</b>	150 kHz to 30 MHz

#### 7.1.2. Limits

Frequency (MHz)	Class B dB(uV)	
	Quasi-peak	Average
0.15 - 0.5	66 – 56 <sup>a</sup>	56 – 46 <sup>a</sup>
0.50 - 5.0	56	46
5.0 - 30.0	60	50

a. Decreases with the logarithm of the frequency

#### 7.1.3. Test Instruments

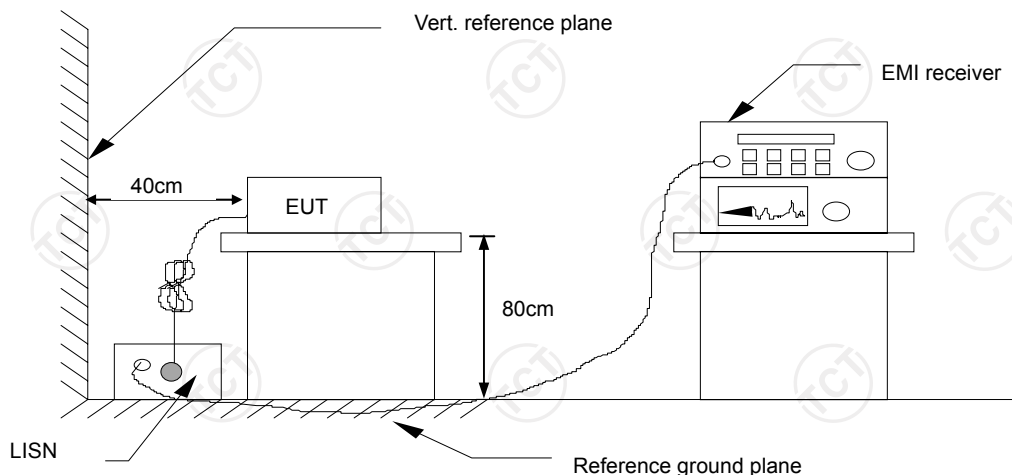
Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	100139	Sep. 16, 2015
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 29, 2015
LISN	AFJ	LS16C	16010947251	Sep. 29, 2015
Coax cable	TCT	CE-05	N/A	Sep.15, 2015

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

#### 7.1.4. Test Method

The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN

**7.1.5. Block Diagram of Test Setup**



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**7.1.6. Test Results**

<b>Test Environment:</b>	Temp.: 25 °C	Humid.: 56 %	Press.: 96 kPa
<b>Test Mode:</b>	Mode 2		
<b>Test Voltage:</b>	AC 120V/60 Hz		
<b>Test Result:</b>	Pass		

**Note:**

L1 = Live Line / N = Neutral Line

“---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Attenuator factor + Cable loss

Level dB(μV) = Reading level dB(μV) + Corr. Factor (dB)

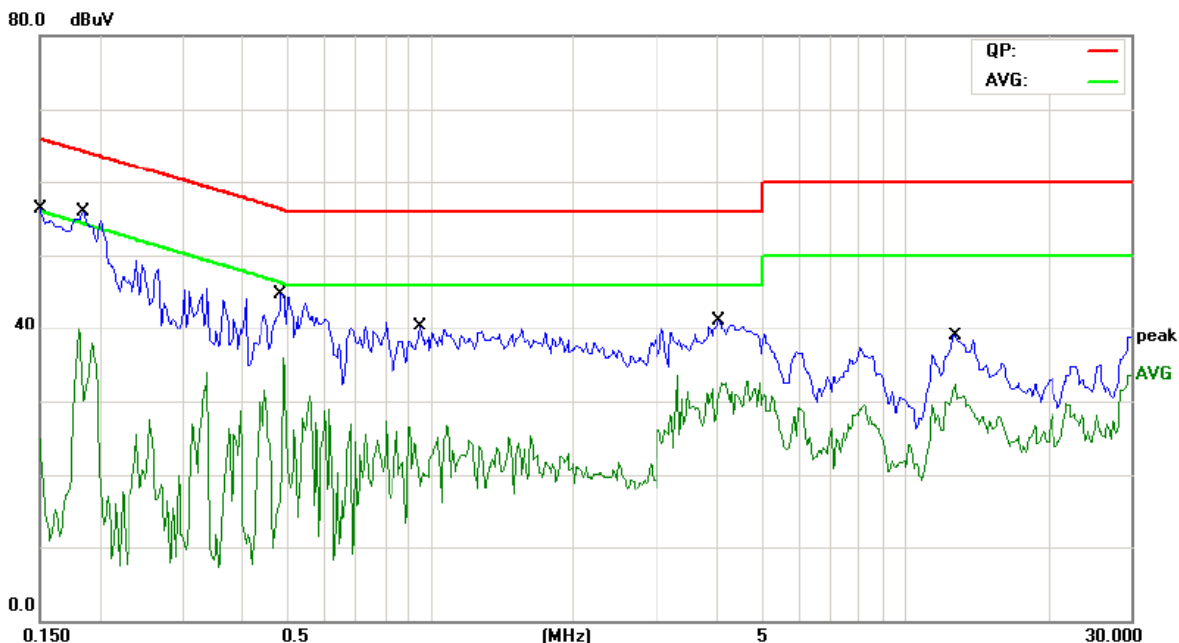
Limit dB(μV) = Limit stated in standard

Margin (dB) = Level dB(μV) – Limits dB(μV)

Q.P. =Quasi-Peak

AVG=Average

Please refer to following diagram for individual



Site Chamber #2

Phase: **L1**

Temperature: 25 (C)

Limit: FCC PART15 Conduction(QP)

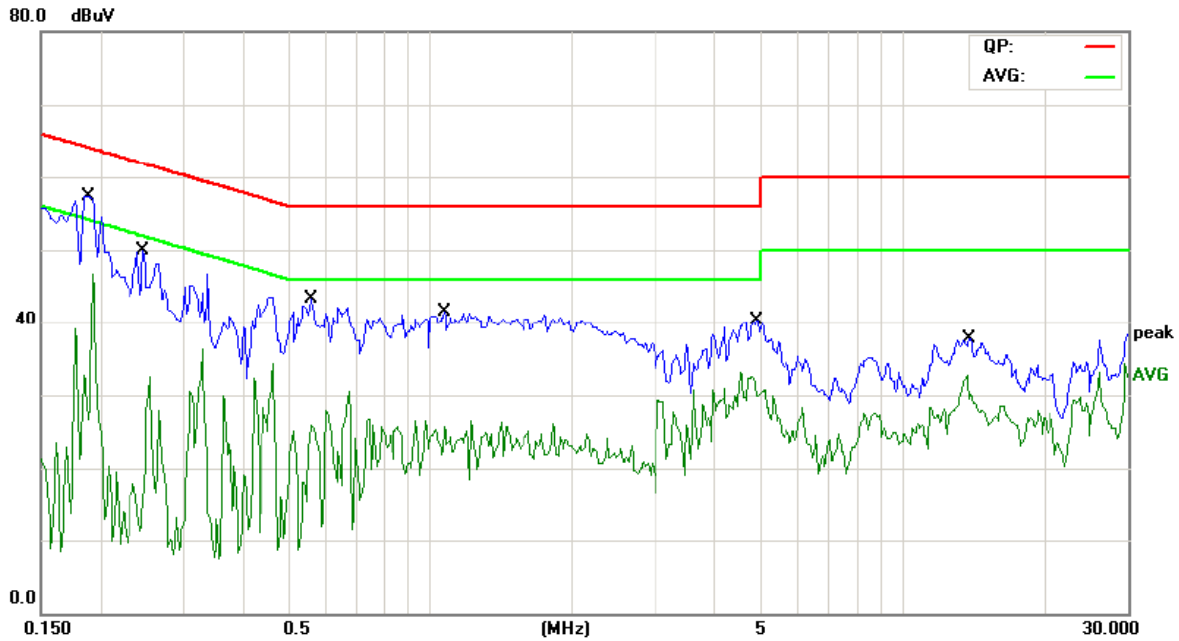
Power: AC 120V/60 Hz

Humidity: 56 %

Mode: Data Transmitting

Note: DC 5V From PC

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	35.73	11.52	47.25	65.99	-18.74	QP	
2		0.1500	7.43	11.52	18.95	55.99	-37.04	AVG	
3	*	0.1852	42.34	11.50	53.84	64.24	-10.40	QP	
4		0.1852	26.95	11.50	38.45	54.24	-15.79	AVG	
5		0.4859	30.17	11.32	41.49	56.24	-14.75	QP	
6		0.4859	14.58	11.32	25.90	46.24	-20.34	AVG	
7		0.9508	23.02	11.18	34.20	56.00	-21.80	QP	
8		0.9508	6.88	11.18	18.06	46.00	-27.94	AVG	
9		4.0508	24.88	10.96	35.84	56.00	-20.16	QP	
10		4.0508	13.39	10.96	24.35	46.00	-21.65	AVG	
11		12.8008	22.35	11.48	33.83	60.00	-26.17	QP	
12		12.8008	14.10	11.48	25.58	50.00	-24.42	AVG	



Site Chamber #2      Phase: **N**      Temperature: 25 (C)  
 Limit: FCC PART15 Conduction(QP)      Power: AC 120V/60 Hz      Humidity: 56 %  
 Mode: Data Transmitting  
 Note: DC 5V From PC

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1891	42.23	11.49	53.72	64.07	-10.35	QP	
2		0.1891	26.70	11.49	38.19	54.07	-15.88	AVG	
3		0.2477	34.95	11.46	46.41	61.83	-15.42	QP	
4		0.2477	19.05	11.46	30.51	51.83	-21.32	AVG	
5		0.5602	28.44	11.28	39.72	56.00	-16.28	QP	
6		0.5602	13.75	11.28	25.03	46.00	-20.97	AVG	
7		1.0758	24.53	11.22	35.75	56.00	-20.25	QP	
8		1.0758	8.05	11.22	19.27	46.00	-26.73	AVG	
9		4.9219	24.33	10.65	34.98	56.00	-21.02	QP	
10		4.9219	13.10	10.65	23.75	46.00	-22.25	AVG	
11		13.9141	20.54	11.57	32.11	60.00	-27.89	QP	
12		13.9141	12.70	11.57	24.27	50.00	-25.73	AVG	



## 7.2. Radiated Emission

### 7.2.1. Test Specification

<b>Test Requirement:</b>	FCC 47 CFR Part 15 Subpart B
<b>Test Method:</b>	ANSI C63.4:2014
<b>Frequency Range:</b>	30 MHz to 6000 MHz
<b>Measurement Distance:</b>	3 m
<b>Antenna Polarization:</b>	Horizontal & Vertical

### 7.2.2. Limits

Frequency (MHz)	Class B (at 3m)
	dBuV/m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
960 ~ 1000	54.0

**Note:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level dB( $\mu$ V/m) = 20 log Emission level ( $\mu$ V/m).

### 7.2.3. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESVD	100008	Sep. 16, 2015
Spectrum Analyzer	R&S	FSEM	848597-001	Sep. 16, 2015
Amplifier	HP	8447D	2727A05017	Sep. 16, 2015
Amplifier	EM	EM30265	07032613	Sep. 16, 2015
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 17, 2015
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 17, 2015
Antenna Mater	CCS	CC-A-4M	N/A	Sep.15 , 2015
Coax cable	TCT	RE-low-01	N/A	Sep.15 , 2015

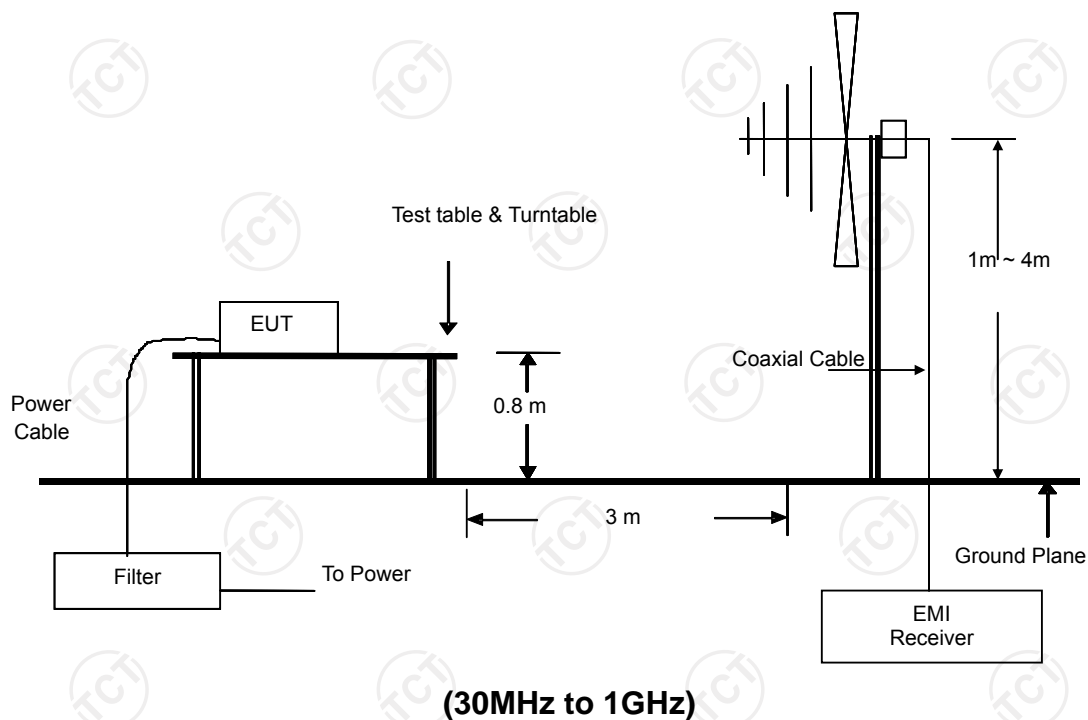
Coax cable	TCT	RE-high-02	N/A	Sep.15 , 2015
Coax cable	TCT	RE-low-03	N/A	Sep.15 , 2015
Coax cable	TCT	RE-high-04	N/A	Sep.15 , 2015

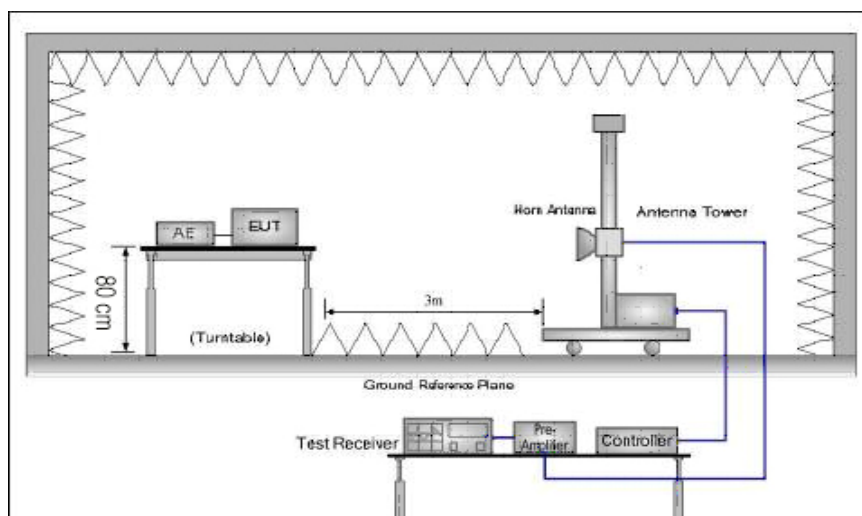
**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

### 7.2.4. Test Method

Measurements were made in a 3-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. Block Diagram of Test Setup.

### 7.2.5. Block Diagram of Test Setup





**(Above 1GHz)**

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration

**7.2.6. Test Results**

<b>Test Environment:</b>	Temp.: 25 °C	Humid.: 55 %	Press.: 96 kPa
<b>Test Mode:</b>	Mode 2		
<b>Test Voltage:</b>	AC 120 V/60 Hz		
<b>Test Result:</b>	Pass		

**Note:**

Freq. = Emission frequency in MHz

Reading level dB(μV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

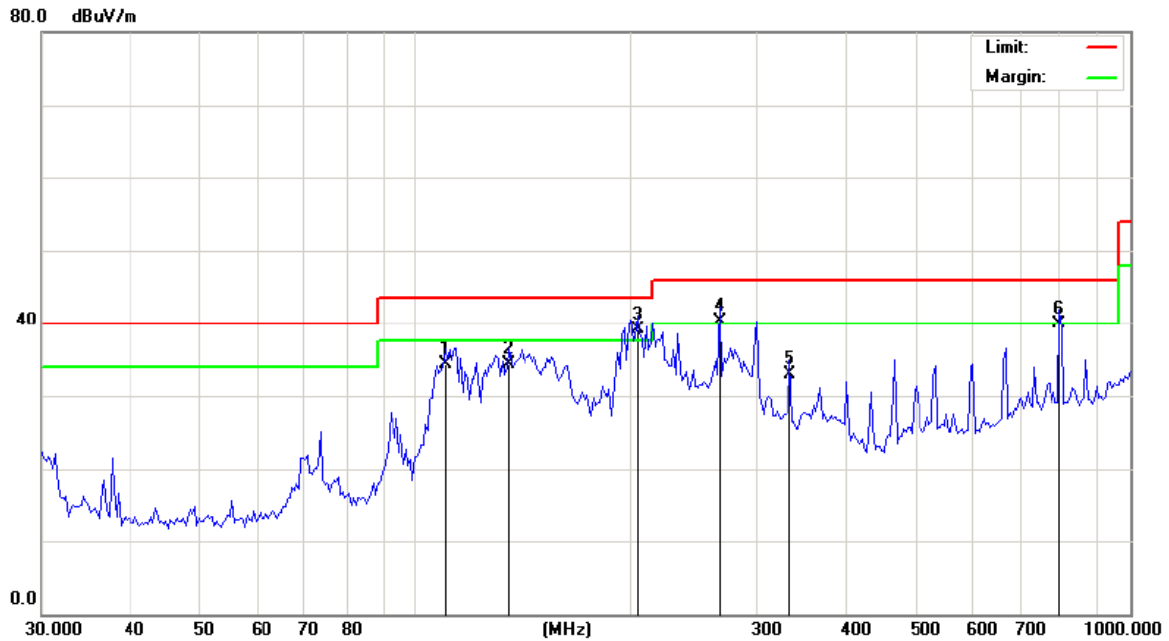
Measurement dB(μV/m) = Reading level dB(μV) + Corr. Factor (dB)

Limit dB(μV/m) = Limit stated in standard

Margin (dB) = Measurement dB(μV/m) – Limits dB(μV/m)

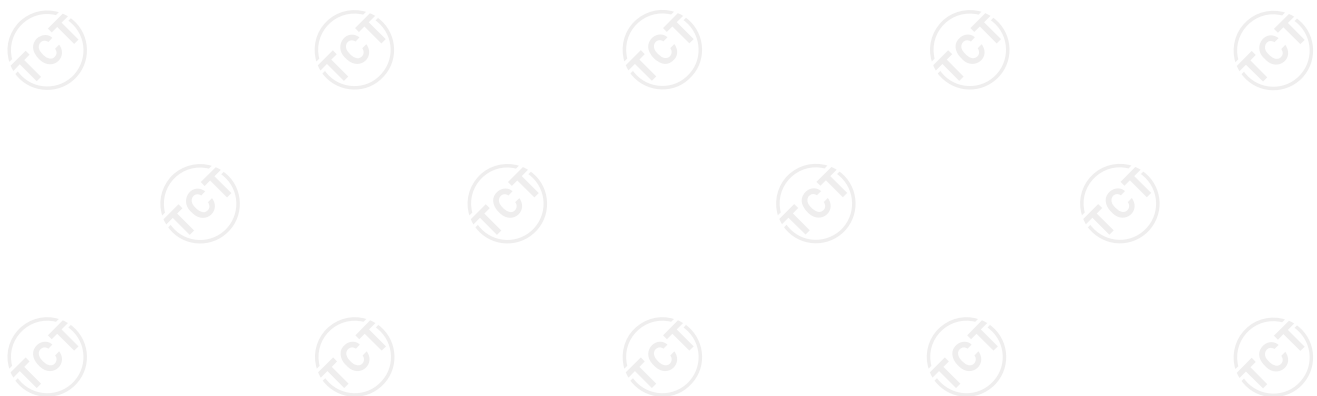
Q.P. =Quasi-Peak

Please refer to following diagram for individual

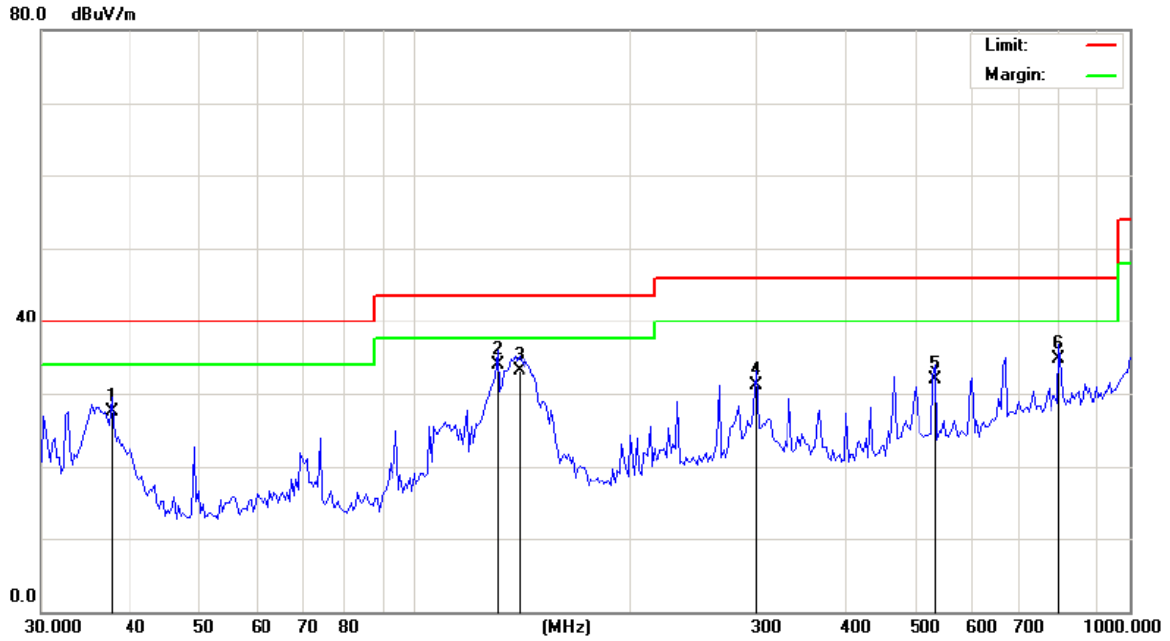


Site: Polarization: **Horizontal** Temperature: 25  
 Limit: FCC Part 15B Class B RE\_3 m Power: AC 120V/60 Hz Humidity: 55 %  
 Mode: Data Transmitting  
 Note: DC 5V From PC

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		110.0818	46.31	-12.01	34.30	43.50	-9.20	QP	0	
2		134.9643	49.54	-15.21	34.33	43.50	-9.17	QP	0	
3	*	204.3052	50.70	-11.53	39.17	43.50	-4.33	QP	0	
4	!	266.8394	49.65	-9.38	40.27	46.00	-5.73	QP	0	
5		334.1254	40.35	-7.54	32.81	46.00	-13.19	QP	0	
6		798.6204	38.42	1.44	39.86	46.00	-6.14	QP	0	







Site: Polarization: **Vertical** Temperature: 25  
 Limit: FCC Part 15B Class B RE\_3 m Power: AC 120V/60 Hz Humidity: 55 %  
 Mode: Data Transmitting  
 Note: DC 5V From PC

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		37.5647	40.27	-12.78	27.49	40.00	-12.51	QP		0
2	*	130.3048	48.97	-15.04	33.93	43.50	-9.57	QP		0
3		139.7907	48.44	-15.38	33.06	43.50	-10.44	QP		0
4		300.6988	39.26	-8.25	31.01	46.00	-14.99	QP		0
5		535.0375	34.52	-2.60	31.92	46.00	-14.08	QP		0
6		798.6204	33.19	1.44	34.63	46.00	-11.37	QP		0

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