



# FCC/IC Radio Test Report

**FCC ID: P4GTVEE26  
IC: 10104A-TVEE26**

This report concerns (check one) :  Original Grant  Class II Change

**Issued Date** : Jul. 13, 2012  
**Project No.** : 1206C140  
**Equipment** : TX Wireless Speaker System  
**Model Name** : Tvee®26  
**Applicant** : Boston Acoustics INC.  
**Address** : 7 Constitution Way, Woburn, Massachusetts 01801, USA  
**Manufacturer** : Boston Acoustics INC.  
**Address** : 7 Constitution Way, Woburn, Massachusetts 01801, USA

**Tested by:**

Neutron Engineering Inc. EMC Laboratory

**Date of Receipt:** Jun. 19, 2012

**Date of Test:**

Jun. 19, 2012 ~ Jul. 12, 2012

Testing Engineer : David Mao  
(David Mao)  
Technical Manager : Leo Hung  
(Leo Hung)  
Authorized Signatory : Steven Lu  
(Steven Lu)

**Neutron Engineering Inc.**

No.3, Jinshagang 1st Road, ShiXia, Dalang  
Town, Dong Guan, China.  
TEL : (0769) 8318-3000 FAX : (0769) 8319-6000



## Declaration

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A**.

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## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



Table of Contents	Page
<b>1 . CERTIFICATION</b>	<b>6</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
<b>2.1 TEST FACILITY</b>	<b>8</b>
<b>2.2 MEASUREMENT UNCERTAINTY</b>	<b>8</b>
<b>3 . GENERAL INFORMATION</b>	<b>9</b>
<b>3.1 GENERAL DESCRIPTION OF EUT</b>	<b>9</b>
<b>3.2 DESCRIPTION OF TEST MODES</b>	<b>11</b>
<b>3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING</b>	<b>11</b>
<b>3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED</b>	<b>12</b>
<b>3.5 DESCRIPTION OF SUPPORT UNITS</b>	<b>13</b>
<b>4 . EMC EMISSION TEST</b>	<b>14</b>
<b>4.1 CONDUCTED EMISSION MEASUREMENT</b>	<b>14</b>
<b>4.1.1 POWER LINE CONDUCTED EMISSION LIMITS</b>	<b>14</b>
<b>4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING</b>	<b>14</b>
<b>4.1.3 TEST PROCEDURE</b>	<b>15</b>
<b>4.1.4 DEVIATION FROM TEST STANDARD</b>	<b>15</b>
<b>4.1.5 TEST SETUP</b>	<b>15</b>
<b>4.1.6 EUT OPERATING CONDITIONS</b>	<b>15</b>
<b>4.1.7 TEST RESULTS</b>	<b>16</b>
<b>4.2 RADIATED EMISSION MEASUREMENT</b>	<b>22</b>
<b>4.2.1 RADIATED EMISSION LIMITS</b>	<b>22</b>
<b>4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING</b>	<b>23</b>
<b>4.2.3 TEST PROCEDURE</b>	<b>24</b>
<b>4.2.4 DEVIATION FROM TEST STANDARD</b>	<b>24</b>
<b>4.2.5 TEST SETUP</b>	<b>25</b>
<b>4.2.6 EUT OPERATING CONDITIONS</b>	<b>26</b>
<b>4.2.7 TEST RESULTS (BETWEEN30 – 1000 MHZ)</b>	<b>27</b>
<b>4.2.8 TEST RESULTS (ABOVE 1000 MHZ)</b>	<b>31</b>
<b>5 . NUMBER OF HOPPING CHANNEL</b>	<b>49</b>
<b>5.1 APPLIED PROCEDURES / LIMIT</b>	<b>49</b>
<b>5.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING</b>	<b>49</b>
<b>5.1.2 TEST PROCEDURE</b>	<b>49</b>
<b>5.1.3 DEVIATION FROM STANDARD</b>	<b>49</b>
<b>5.1.4 TEST SETUP</b>	<b>49</b>
<b>5.1.5 EUT OPERATION CONDITIONS</b>	<b>49</b>
<b>5.1.6 TEST RESULTS</b>	<b>50</b>
<b>6 . AVERAGE TIME OF OCCUPANCY</b>	<b>51</b>



## Table of Contents

	Page
6.1 APPLIED PROCEDURES / LIMIT	51
6.1.1 MEASUREMENT INSTRUMENTS LIST	51
6.1.2 TEST PROCEDURE	51
6.1.3 DEVIATION FROM STANDARD	51
6.1.4 TEST SETUP	52
6.1.5 EUT OPERATION CONDITIONS	52
6.1.6 TEST RESULTS	53
7 . HOPPING CHANNEL SEPARATION MEASUREMENT	55
7.1 APPLIED PROCEDURES / LIMIT	55
7.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING	55
7.1.2 TEST PROCEDURE	55
7.1.3 DEVIATION FROM STANDARD	55
7.1.4 TEST SETUP	55
7.1.5 EUT OPERATION CONDITIONS	55
7.1.6 TEST RESULTS	56
8 . BANDWIDTH TEST	58
8.1 APPLIED PROCEDURES / LIMIT	58
8.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING	58
8.1.2 TEST PROCEDURE	58
8.1.3 DEVIATION FROM STANDARD	58
8.1.4 TEST SETUP	58
8.1.5 EUT OPERATION CONDITIONS	58
8.1.6 TEST RESULTS	59
9 . PEAK OUTPUT POWER TEST	61
9.1 APPLIED PROCEDURES / LIMIT	61
9.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING	61
9.1.2 TEST PROCEDURE	61
9.1.3 DEVIATION FROM STANDARD	61
9.1.4 TEST SETUP	61
9.1.5 EUT OPERATION CONDITIONS	61
9.1.6 TEST RESULTS	62
10 . ANTENNA CONDUCTED SPURIOUS EMISSION	64
10.1 APPLIED PROCEDURES / LIMIT	64
10.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING	64
10.1.2 TEST PROCEDURE	64
10.1.3 DEVIATION FROM STANDARD	64
10.1.4 TEST SETUP	64
10.1.5 EUT OPERATION CONDITIONS	64
10.1.6 TEST RESULTS	65



**Table of Contents**

**11 . EUT TEST PHOTO**

**Page**

**71**



## **1. CERTIFICATION**

Equipment: TX Wireless Speaker System

Brand Name: Boston®

Model Name: Tvee®26

Applicant: Boston Acoustics INC.

Factory: Premium Loudspeakers (Huizhou) Co., Ltd

Address: Tympany Industrial Area, Xin Lian Village, Xin Xu Tow, Hui Yang District, Hui Zhou City, Guang Dong Province, P.R.C China

Date of Test: Jun. 19, 2012 ~ Jul. 12, 2012

Test Item: ENGINEERING SAMPLE

FCC Part15, Subpart C(15.247) / ANSI C63.4 : 2009 / ANSI C63.10:2009 /

Standards: FCC Public Notice DA 00-705, March 30, 2000.

Canada RSS-210:2010

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-1-1206C140) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

<b>APPLIED STANDARD: 47 CFR Part 15, Subpart C; Canada RSS-210:2010</b>				
Standard Section		Test Item	Judgment	Remark
RSS-210	47 CFR Part 15			
RSS-GEN 7.2.2	15.207	Conducted Emission	PASS	
RSS-210 Annex 8 (A8.1d)	15.247(d)	Antenna conducted Spurious Emission	PASS	
RSS-210 Annex 8 (A8.1d)	15.247 (a)(1)	Hopping Channel Separation	PASS	
RSS-210 Annex 8 (A8.1b)	15.247 (b)(1)	Peak Output Power	PASS	
RSS-210 Annex 8 (A8.1a)	15.247(d) 15.209	Radiated Spurious Emission	PASS	
RSS-210 Annex 8 (A8.4(2))	15.247 (a)(1)(iii)	Number of Hopping Frequency	PASS	
<b>RSS-210 Annex 8 (A8.5)</b>	<b>15.247 (a)(1)(iii)</b>	Dwell Time	PASS	
RSS-Gen 7.2.3	15.205	Restricted Bands	PASS	
RSS-210 Annex 8 (A8.5)	15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) According to FCC Public Notice DA 00-705, March 30, 2000.



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792

Neutron's test firm number for FCC 319330

Neutron's test firm number for IC 4428B-1

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
DG-C01	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	TX Wireless Speaker System														
Brand Name	Boston®														
Model Name	Tvee®26														
OEM Brand/Model Name	N/A														
Model Difference	N/A														
Product Description	<p>The EUT is a TX Wireless Speaker System</p> <table border="1"><tr><td>Operation Frequency:</td><td>2406~2474 MHz</td></tr><tr><td>Modulation Type:</td><td>FHSS</td></tr><tr><td>Bit Rate of Transmitter</td><td>5Mbps</td></tr><tr><td>Number of Channel</td><td>18 CH</td></tr><tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr><tr><td>Antenna Gain(Peak)</td><td>Please see Note 3.</td></tr><tr><td>Output Power:</td><td>1.85 dBm</td></tr></table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p>	Operation Frequency:	2406~2474 MHz	Modulation Type:	FHSS	Bit Rate of Transmitter	5Mbps	Number of Channel	18 CH	Antenna Designation:	Please see Note 3.	Antenna Gain(Peak)	Please see Note 3.	Output Power:	1.85 dBm
Operation Frequency:	2406~2474 MHz														
Modulation Type:	FHSS														
Bit Rate of Transmitter	5Mbps														
Number of Channel	18 CH														
Antenna Designation:	Please see Note 3.														
Antenna Gain(Peak)	Please see Note 3.														
Output Power:	1.85 dBm														
Power Source	DC Voltage supplied from AC/DC adapter. Brand name: DYS Model name: DYS40-180200W														
Power Rating	I/P 100-240V~50/60Hz, 1.0A MAX O/P 18.0V 2.0A														
Connecting I/O Port(s)	Please refer to the User's Manual														

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

<b>Channel List</b>			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>01</b>	<b>2406</b>	<b>10</b>	<b>2442</b>
02	2410	11	2446
03	2414	12	2450
04	2418	13	2454
05	2422	14	2458
06	2426	15	2462
07	2430	16	2466
08	2434	17	2470
09	2438	<b>18</b>	<b>2474</b>

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB Antenna	N/A	3.3



## 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	AUX IN 1
Mode 2	AUX IN 2
Mode 3	Optical Digital In
Mode 4	TX Mode <b>NOTE (1)</b>
Mode 5	RX Mode <b>NOTE (1)</b>

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For Conducted Emission	
Final Test Mode	Description
Mode 1	AUX IN 1
Mode 2	AUX IN 2
Mode 3	Optical Digital In

For Radiated Emission	
Final Test Mode	Description
Mode 4	TX Mode <b>NOTE (1)</b>
Mode 5	RX Mode <b>NOTE (1)</b>

### Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.

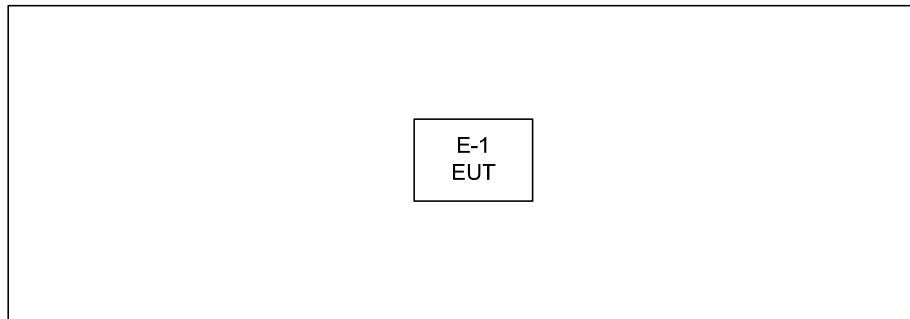
## 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	N/A		
Frequency	2406 MHz	2406 MHz	2406 MHz
Parameters-5Mbps	N/A	N/A	N/A



**3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**





### 3.5 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.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID/IC	Series No.	Note
E-1	TX Wireless Speaker System	Boston®	Tvee®26	P4GTVEE26/ 10104A-TVEE26	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
N/A	-	--	--	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in m in 『Length』 column.



## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2SH	00052766	May.04.2013
2	LISN	R&S	ENV216	100526	Nov.25.2012
3	Test Cable	N/A	RG400 12m	N/A	Mar.16.2013
4	EMI TEST RECEIVER	R&S	ESCI	100895	May.04.2013
5	50Ω Terminator	SHX	TF2-3G-A	08122901	May.04.2013

Remark: " N/A " denotes No Model No. , Serial No. or No Calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

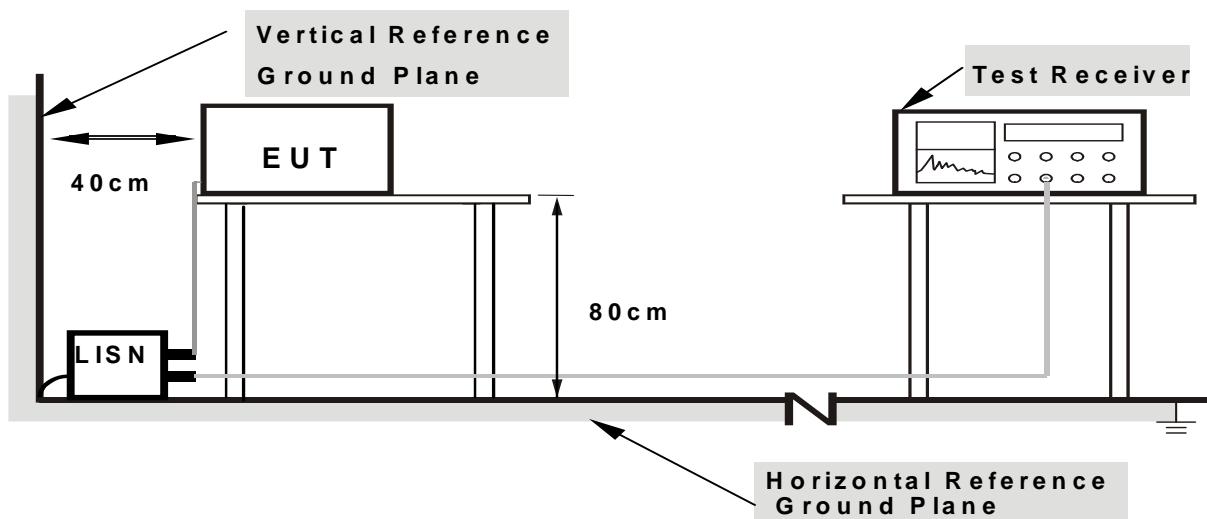
#### 4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

#### 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT is continue Transmitter/Receive data or Hopping on mode.

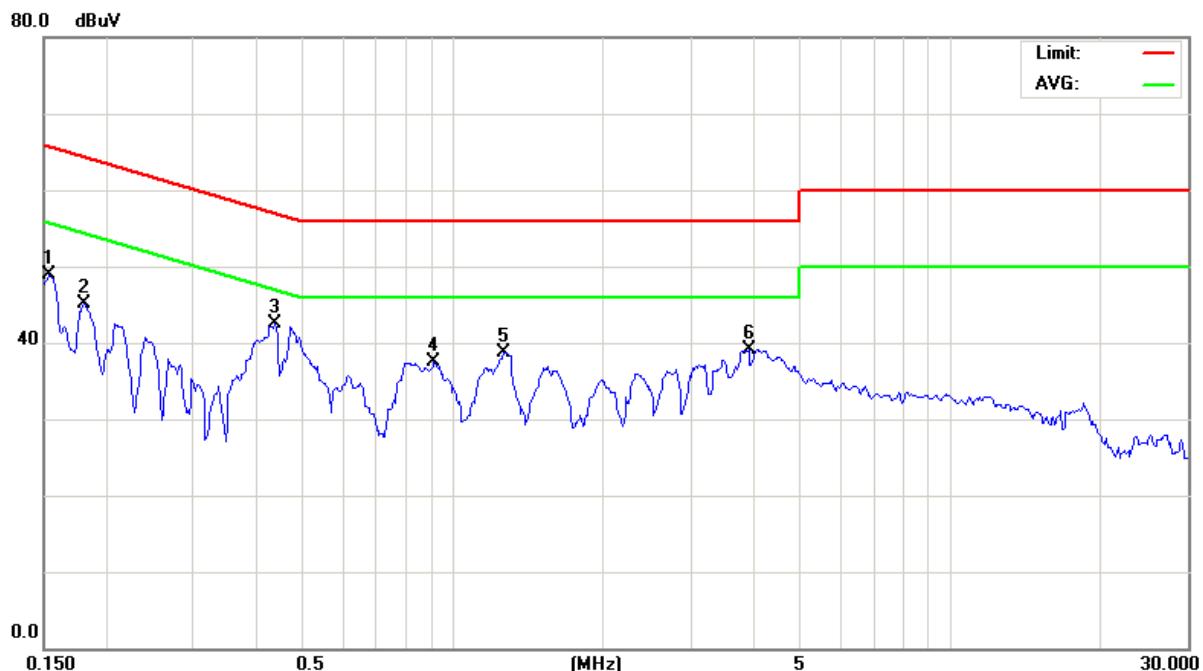
**4.1.7 TEST RESULTS**

EUT :	TX Wireless Speaker System	Model Name. :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	AUX IN 1		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Line	48.81	*	65.78	55.78	-16.97	(QP)
0.18	Line	45.19	*	64.43	54.43	-19.24	(QP)
0.44	Line	42.50	*	57.08	47.08	-14.58	(QP)
0.92	Line	37.53	*	56.00	46.00	-18.47	(QP)
1.26	Line	38.80	*	56.00	46.00	-17.20	(QP)
3.93	Line	39.06	*	56.00	46.00	-16.94	(QP)

**Remark**

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz, VBW =10KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz, VBW=10KHz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “\*” marked in AVG Mode column of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.



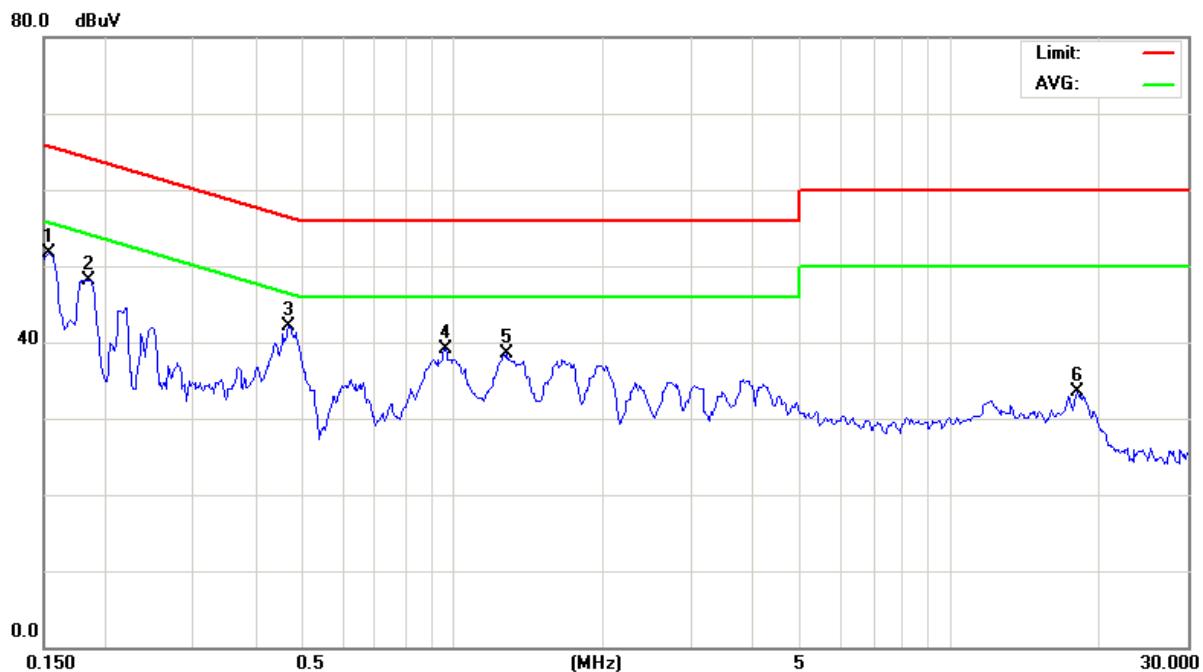


EUT :	TX Wireless Speaker System	Model Name. :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	AUX IN 1		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Neutral	51.78	*	65.78	55.78	-14.00	(QP)
0.19	Neutral	48.10	*	64.25	54.25	-16.15	(QP)
0.47	Neutral	42.01	*	56.58	46.58	-14.57	(QP)
0.96	Neutral	39.11	*	56.00	46.00	-16.89	(QP)
1.28	Neutral	38.41	*	56.00	46.00	-17.59	(QP)
17.96	Neutral	33.54	*	60.00	50.00	-26.46	(QP)

**Remark**

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz, VBW =10KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz, VBW=10KHz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “\*” marked in AVG Mode column of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.



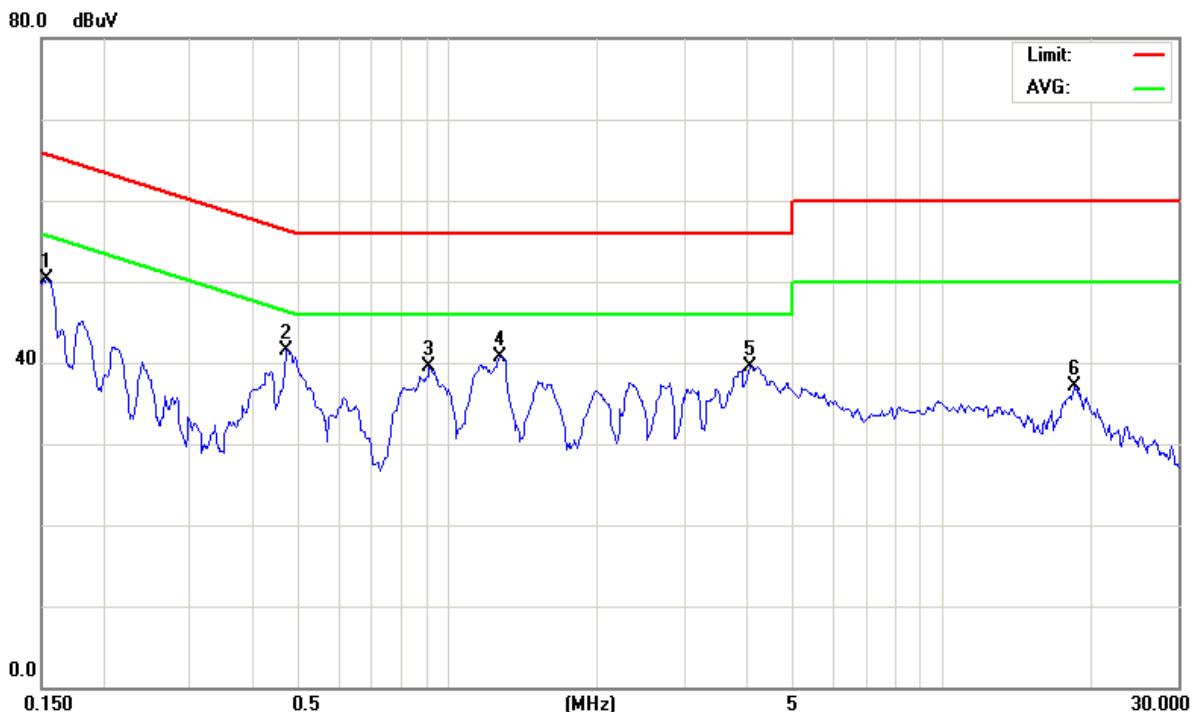


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	AUX IN 2		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Line	50.31	*	65.78	55.78	-15.47	(QP)
0.47	Line	41.51	*	56.51	46.51	-15.00	(QP)
0.92	Line	39.53	*	56.00	46.00	-16.47	(QP)
1.27	Line	40.74	*	56.00	46.00	-15.26	(QP)
4.08	Line	39.56	*	56.00	46.00	-16.44	(QP)
18.54	Line	37.10	*	60.00	50.00	-22.90	(QP)

**Remark**

- (1) All readings are QP Mode value unless otherwise stated AVG in column of "Note". If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.



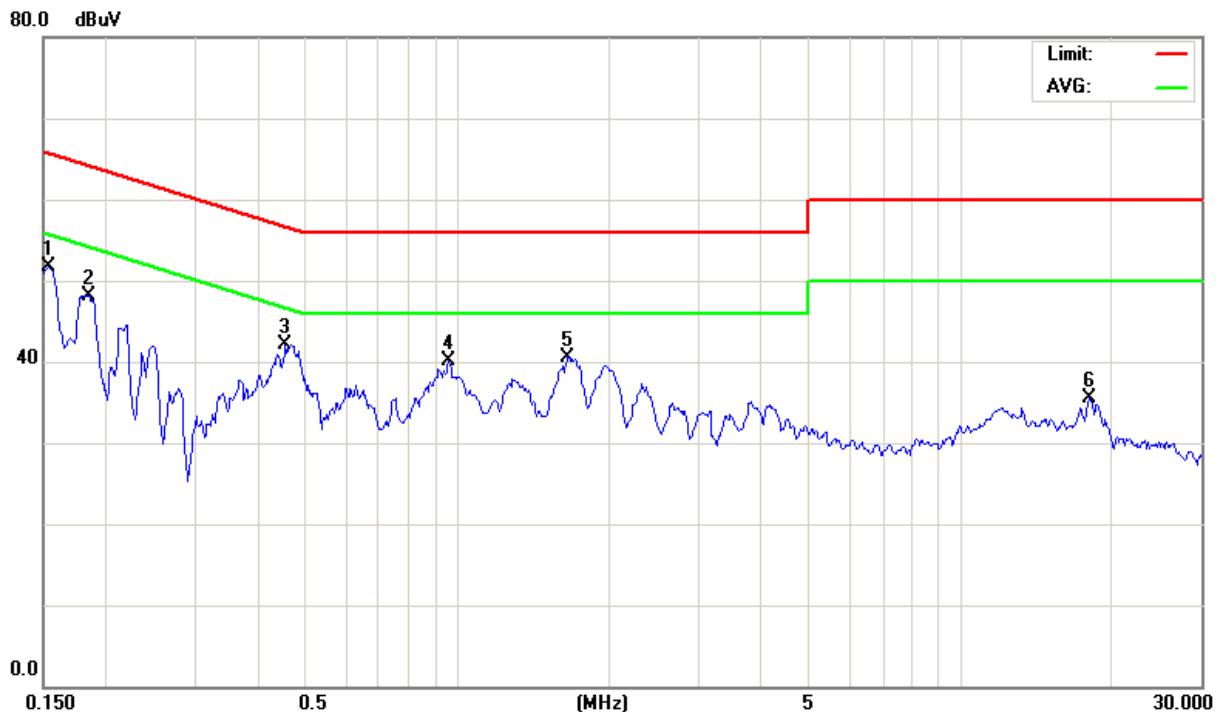


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	AUX IN 2		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Neutral	51.78	*	65.78	55.78	-14.00	(QP)
0.19	Neutral	48.10	*	64.26	54.26	-16.16	(QP)
0.45	Neutral	42.17	*	56.79	46.79	-14.62	(QP)
0.96	Neutral	40.07	*	56.00	46.00	-15.93	(QP)
1.66	Neutral	40.60	*	56.00	46.00	-15.40	(QP)
17.96	Neutral	35.64	*	60.00	50.00	-24.36	(QP)

**Remark**

- (1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “\*” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.



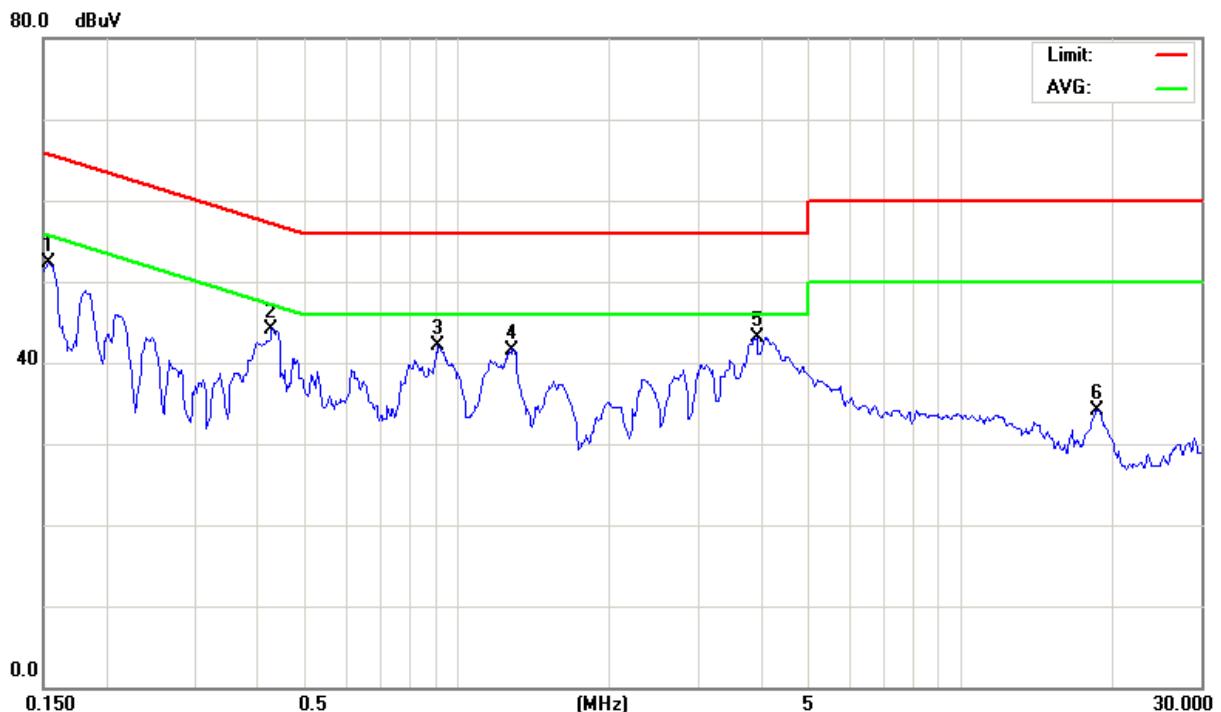


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Optical Digital In		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Line	52.31	*	65.78	55.78	-13.47	(QP)
0.43	Line	44.14	*	57.31	47.31	-13.17	(QP)
0.92	Line	42.03	*	56.00	46.00	-13.97	(QP)
1.28	Line	41.60	*	56.00	46.00	-14.40	(QP)
3.93	Line	43.06	*	56.00	46.00	-12.94	(QP)
18.69	Line	34.16	*	60.00	50.00	-25.84	(QP)

## Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of "Note". If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.





EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	Optical Digital In		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	Neutral	51.78	*	65.78	55.78	-14.00	(QP)
0.18	Neutral	51.58	*	64.34	54.34	-12.76	(QP)
0.47	Neutral	43.93	*	56.51	46.51	-12.58	(QP)
0.96	Neutral	39.61	*	56.00	46.00	-16.39	(QP)
3.84	Neutral	36.01	*	56.00	46.00	-19.99	(QP)
17.27	Neutral	36.31	*	60.00	50.00	-23.69	(QP)

**Remark**

- (1) All readings are QP Mode value unless otherwise stated AVG in column of "Note". If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

**4.2.2 MEASUREMENT INSTRUMENTS LIST AND SETTING**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	May.25.2013
2	Amplifier	HP	8447D	2944A09673	May.04.2013
3	Test Receiver	R&S	ESCI	100382	May.04.2013
4	Test Cable	N/A	C-01_CB03	N/A	Jul.01.2013
5	Antenna	ETS	3115	00075789	May.25.2013
6	Amplifier	Agilent	8449B	3008A02274	May.04.2013
7	Spectrum	Agilent	E4408B	US39240143	Nov.25.2012
8	Test Cable	HUBER+SUHNER	C-45	N/A	May.02.2013
9	Controller	CT	SC100	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	May.25.2013
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	May.04.2013
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct.13.2012

Remark: " N/A " denotes No Model Name / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz for PK/AVG detector
Start ~ Stop Frequency	90kHz~110kHz for QP detector
Start ~ Stop Frequency	110kHz~490kHz for PK/AVG detector
Start ~ Stop Frequency	490kHz~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector



#### **4.2.3 TEST PROCEDURE**

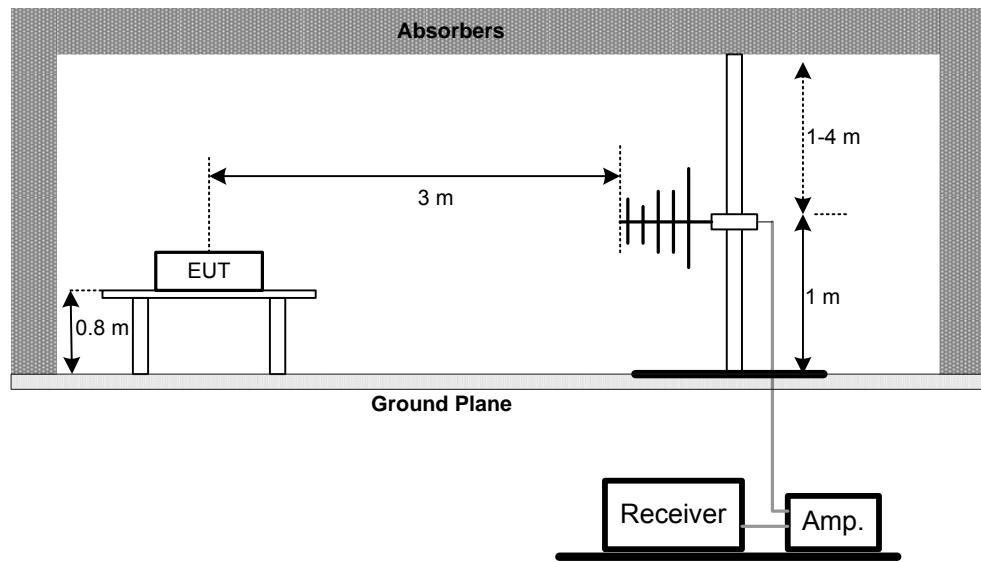
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### **4.2.4 DEVIATION FROM TEST STANDARD**

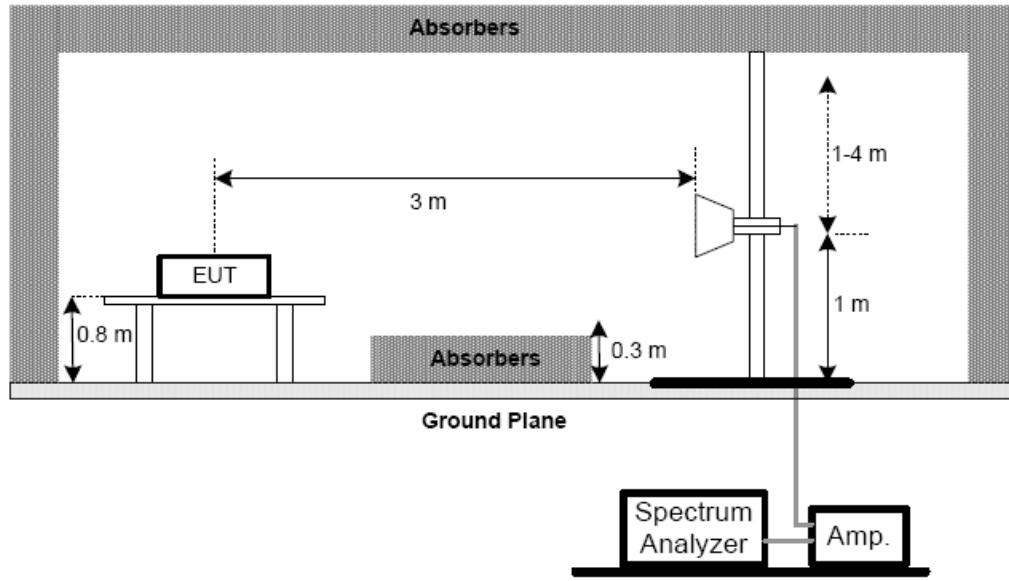
No deviation

#### 4.2.5 TEST SETUP

##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz

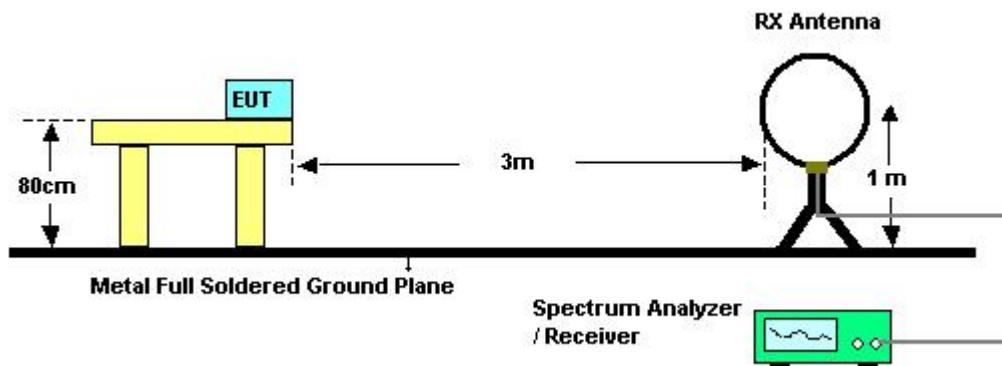


##### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz





(C) For radiated emissions below 30MHz



#### **4.2.6 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

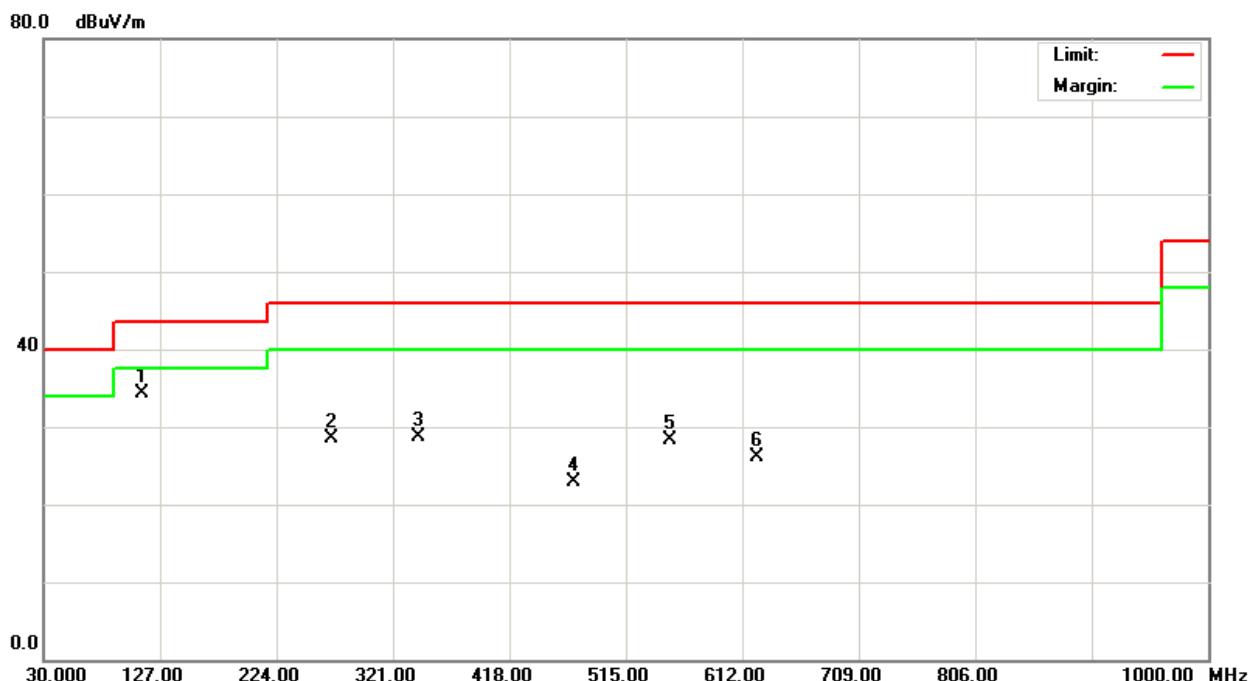
**4.2.7 TEST RESULTS (BETWEEN30 – 1000 MHZ)**

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2406MHz –CH01-5Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
112.45	V	52.71	-18.34	34.37	43.50	- 9.13	
270.08	V	41.87	-13.28	28.59	46.00	- 17.41	
342.83	V	39.73	-11.01	28.72	46.00	- 17.28	
471.35	V	30.66	-7.79	22.87	46.00	- 23.13	
551.38	V	33.84	-5.45	28.39	46.00	- 17.61	
624.13	V	29.96	-3.82	26.14	46.00	- 19.86	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



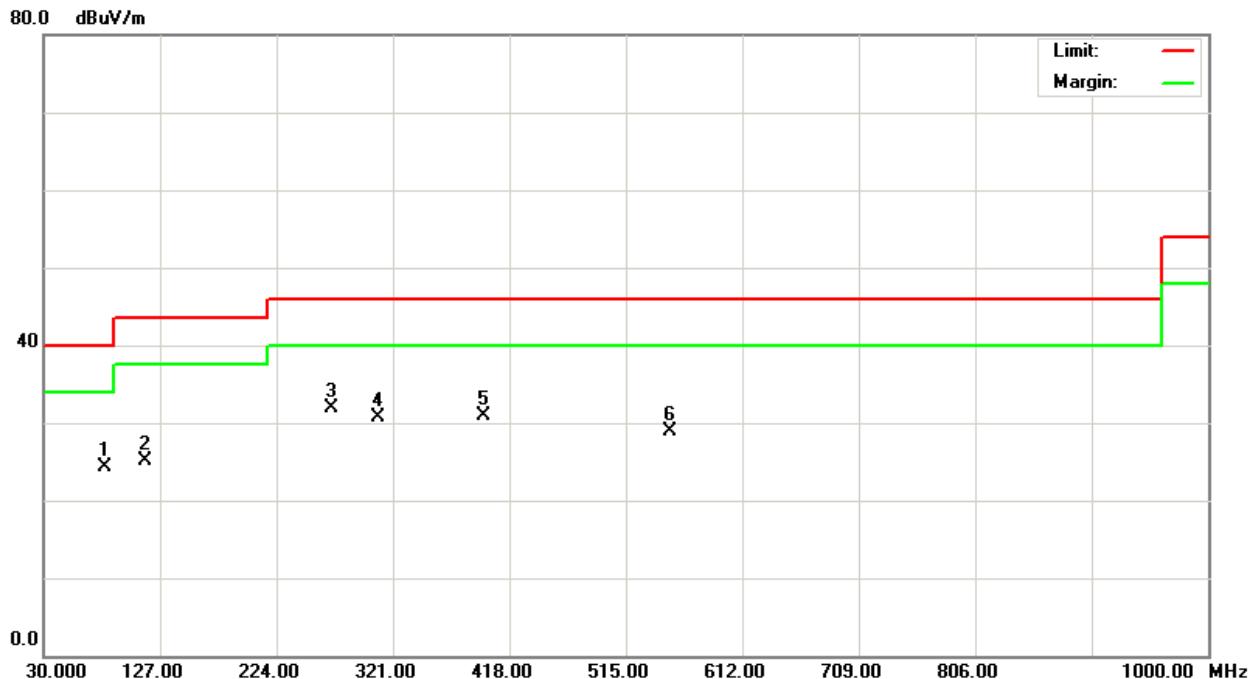


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2406MHz -CH01-5Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
80.93	H	43.46	-19.07	24.39	40.00	- 15.61	
114.88	H	43.50	-18.32	25.18	43.50	- 18.32	
270.08	H	45.25	-13.28	31.97	46.00	- 14.03	
308.88	H	42.51	-11.85	30.66	46.00	- 15.34	
396.18	H	40.06	-9.16	30.90	46.00	- 15.10	
551.38	H	34.31	-5.45	28.86	46.00	- 17.14	

#### Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



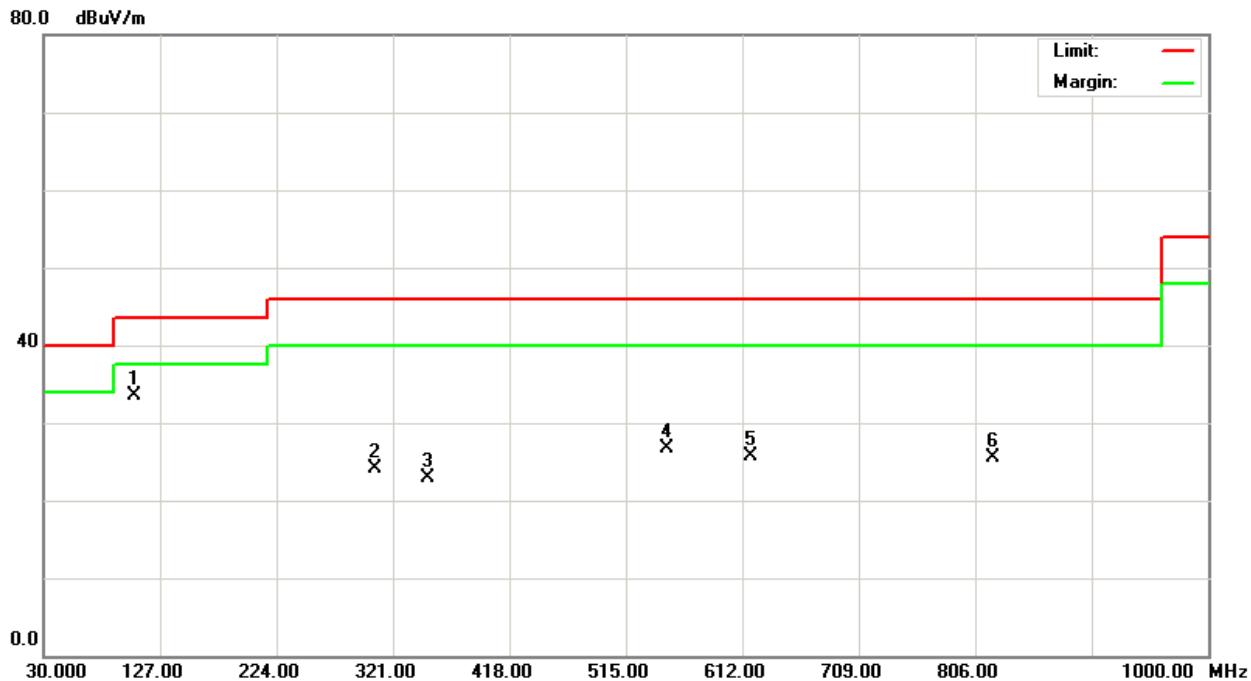


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2406MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
105.18	V	51.95	-18.38	33.57	43.50	- 9.93	
306.45	V	36.02	-11.91	24.11	46.00	- 21.89	
350.10	V	33.76	-10.84	22.92	46.00	- 23.08	
548.95	V	32.20	-5.53	26.67	46.00	- 19.33	
619.28	V	29.65	-3.90	25.75	46.00	- 20.25	
820.55	V	26.97	-1.47	25.50	46.00	- 20.50	

#### Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



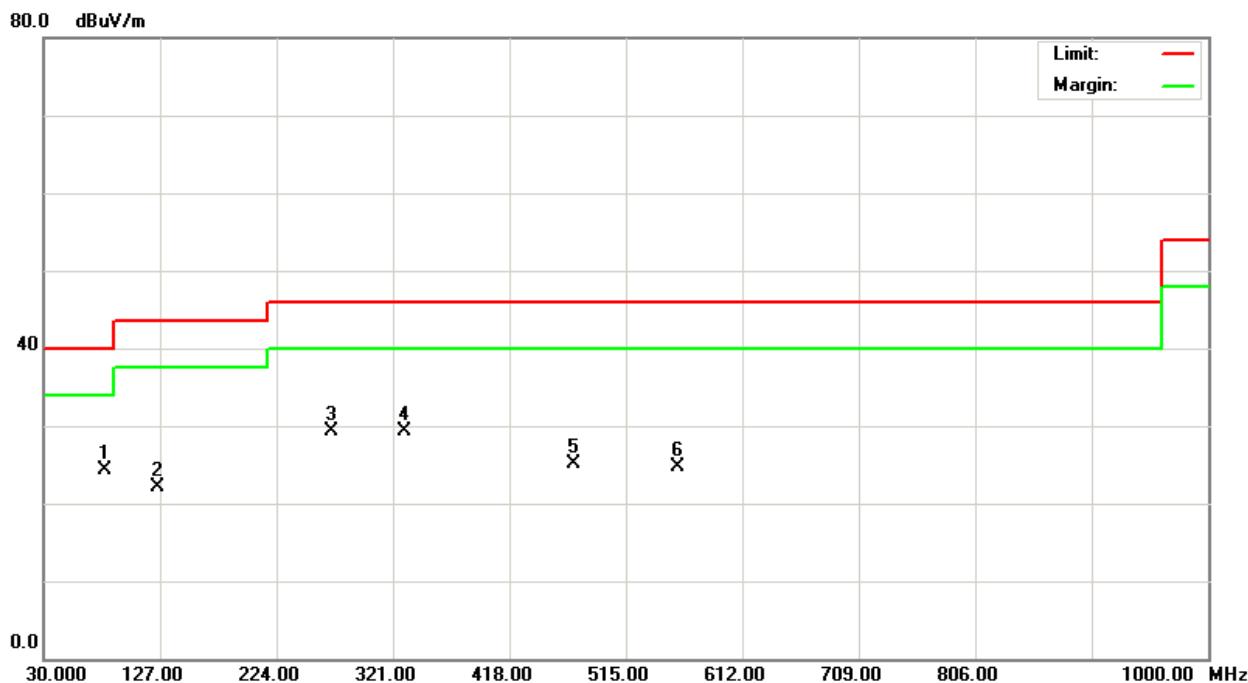


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2406MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
80.93	H	43.40	-19.07	24.33	40.00	- 15.67	
124.58	H	40.22	-18.20	22.02	43.50	- 21.48	
270.08	H	42.57	-13.28	29.29	46.00	- 16.71	
330.70	H	40.66	-11.32	29.34	46.00	- 16.66	
471.35	H	32.97	-7.79	25.18	46.00	- 20.82	
558.65	H	30.02	-5.28	24.74	46.00	- 21.26	

#### Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



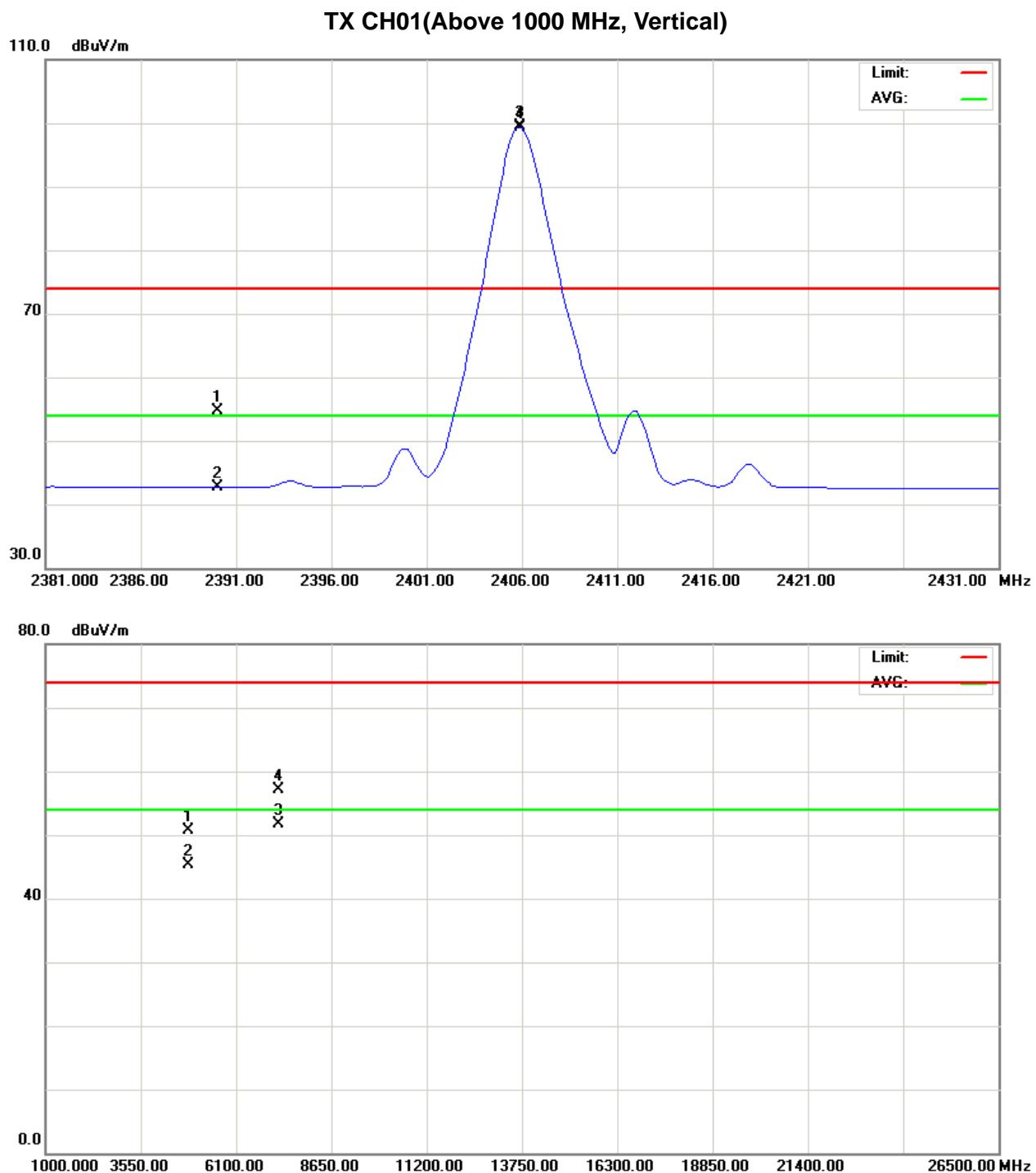
**4.2.8 TEST RESULTS (ABOVE 1000 MHZ)**

EUT :	TX Wireless Speaker System			Model Name :	Tvee®26		
Temperature :	25 °C			Relative Humidity :	58 %		
Pressure :	1010 hPa			Test Voltage :	AC 120V/60Hz		
Test Mode :	TX 2406MHz – CH01-5Mbps						

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	22.71	10.82	31.91	54.62	42.73	74.00	54.00	X/E
<b>2405.88</b>	<b>V</b>	<b>67.61</b>	<b>67.44</b>	<b>31.90</b>	<b>99.51</b>	<b>99.34</b>			<b>X/F</b>
4811.64	V	45.51	40.11	5.24	50.75	45.35	74.00	54.00	X/H
7217.48	V	46.08	40.57	11.10	57.18	51.67	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



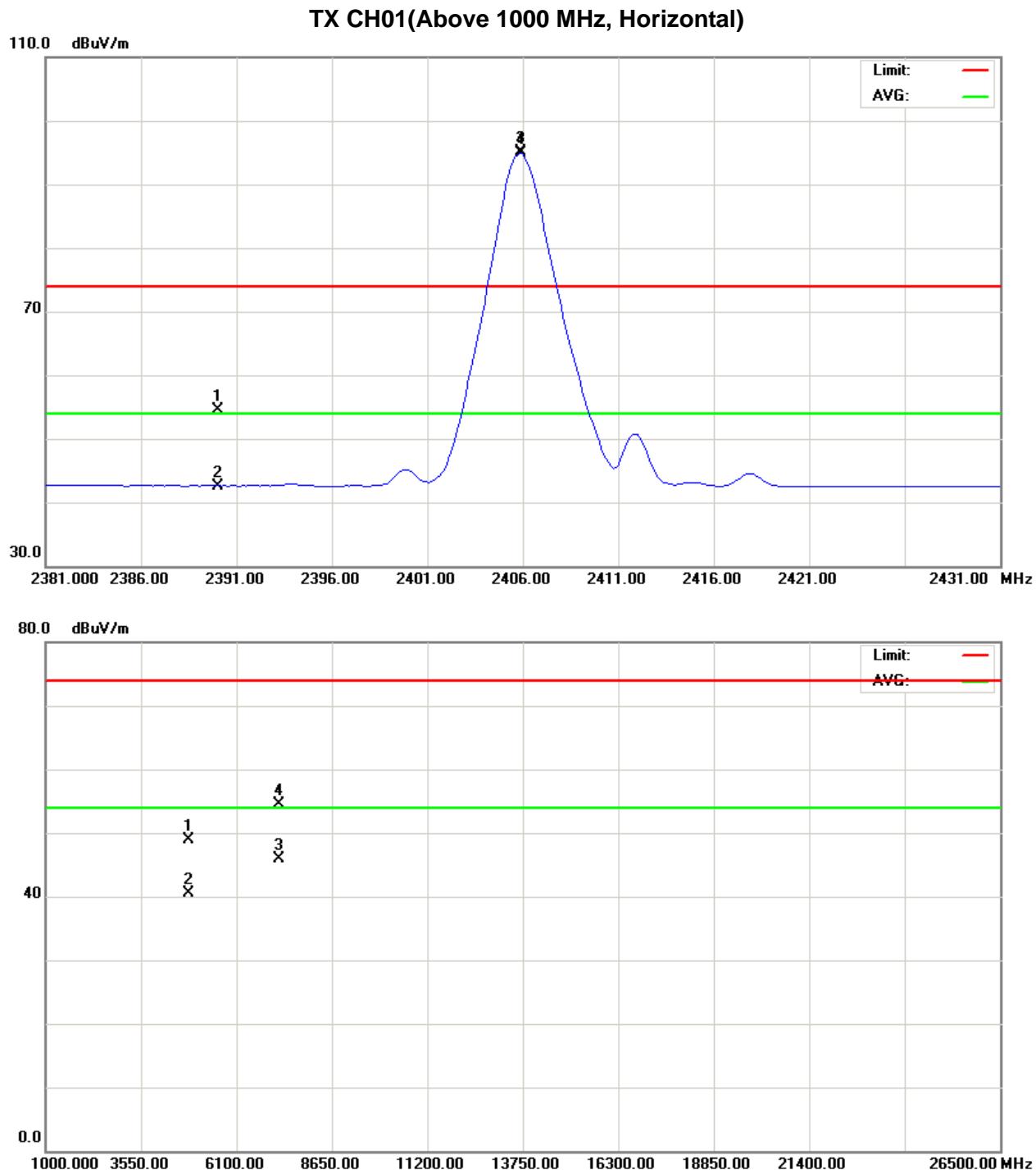


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2406MHz – CH01-5Mbps		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	22.67	10.69	31.91	54.58	42.60	74.00	54.00	X/E
<b>2405.88</b>	<b>H</b>	<b>63.12</b>	<b>62.94</b>	<b>31.90</b>	<b>95.02</b>	<b>94.84</b>			<b>X/F</b>
4811.63	H	43.59	35.20	5.24	48.83	40.44	74.00	54.00	X/H
7217.50	H	43.50	34.75	11.10	54.60	45.85	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna





EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2442MHz -CH10-5Mbps		

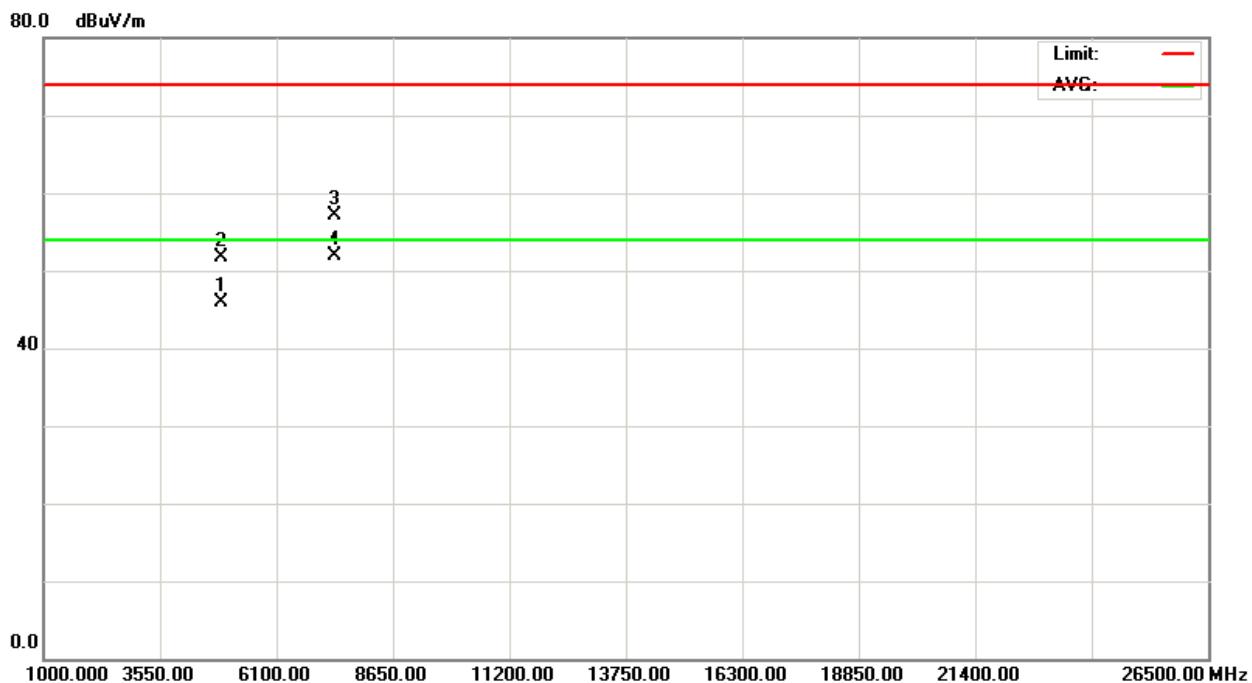
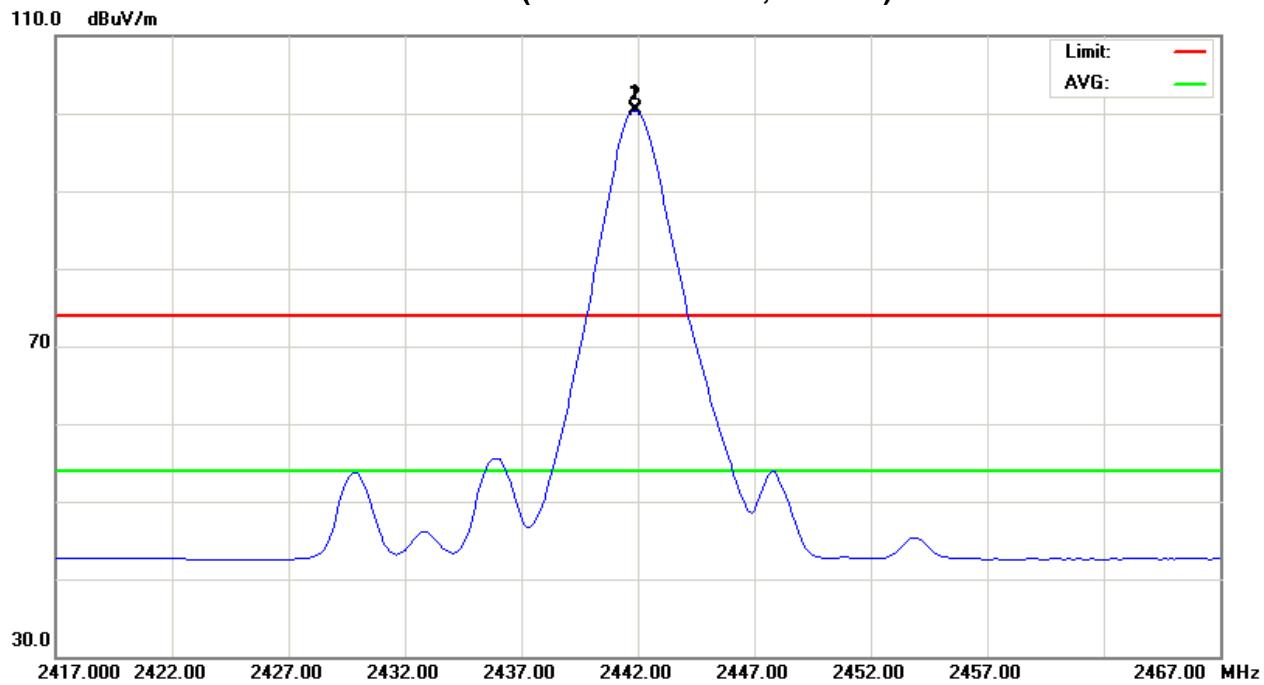
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>2441.88</b>	<b>V</b>	<b>68.69</b>	<b>68.52</b>	<b>31.85</b>	<b>100.54</b>	<b>100.37</b>			<b>X/F</b>
4883.66	V	46.27	40.45	5.50	51.77	45.95	74.00	54.00	X/H
7325.41	V	45.98	40.76	11.15	57.13	51.91	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**TX CH10 (Above 1000 MHz, Vertical)**



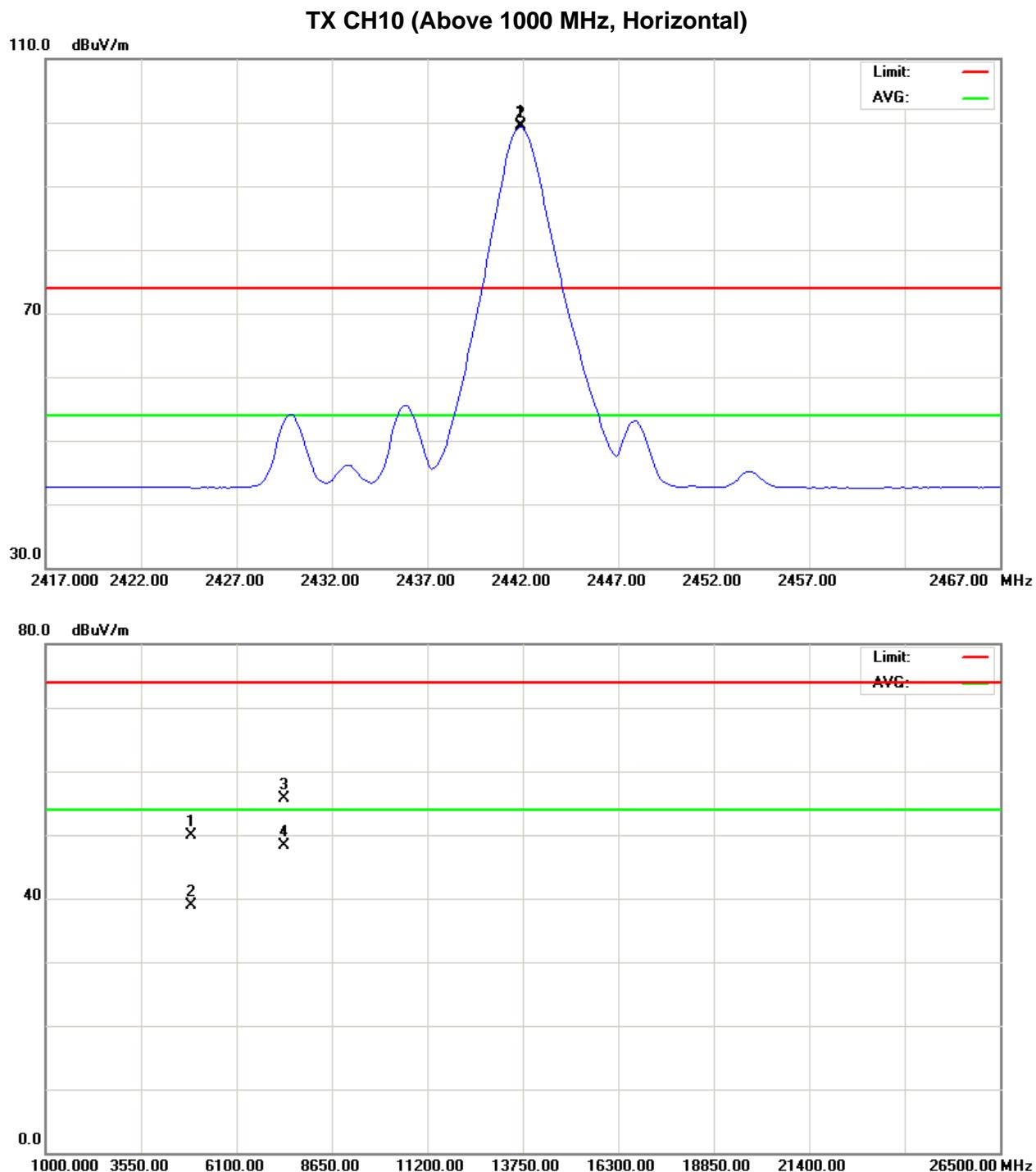


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2442MHz -CH10-5Mbps		

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
<b>2441.88</b>	<b>H</b>	<b>67.59</b>	<b>67.39</b>	<b>31.85</b>	<b>99.44</b>	<b>99.24</b>			<b>X/F</b>
4883.46	H	44.39	33.46	5.50	49.89	38.96	74.00	54.00	X/H
7325.44	H	44.53	37.16	11.15	55.68	48.31	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna





EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2474MHz -CH18-5Mbps		

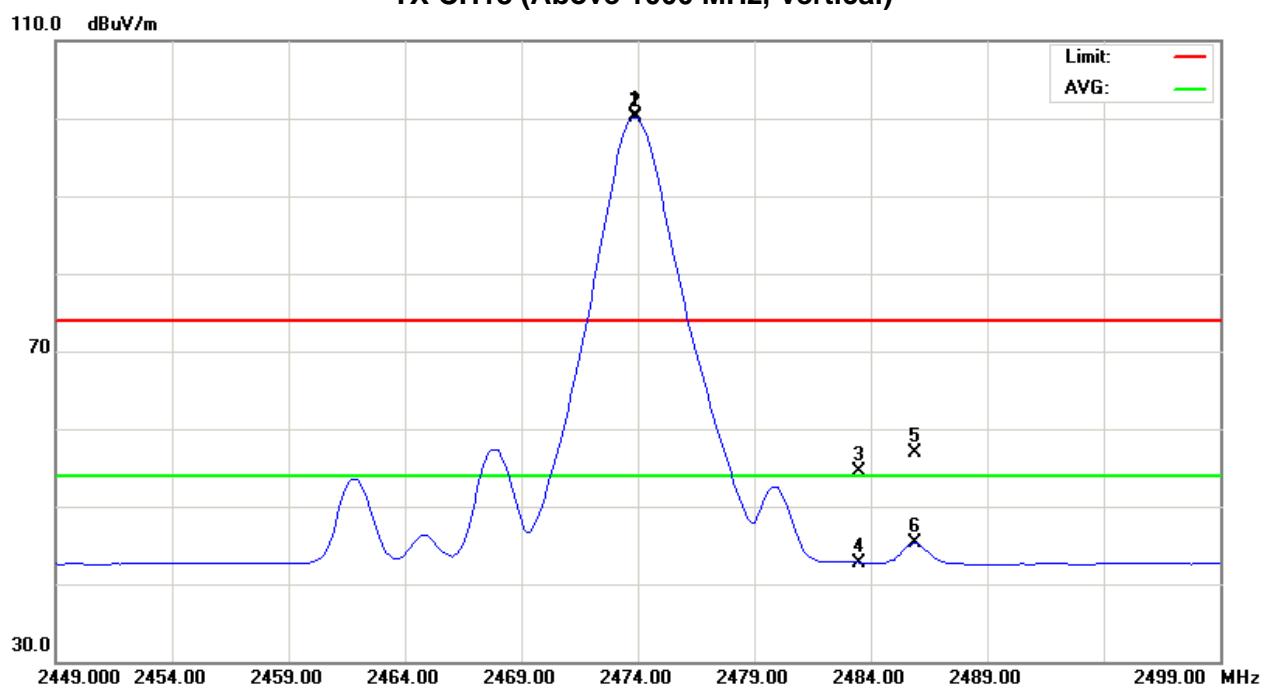
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2473.88	V	68.55	68.36	31.81	100.36	100.17			X/F
2483.50	V	22.69	10.99	31.80	54.49	42.79	74.00	54.00	X/E
2485.88	V	25.16	13.43	31.80	56.96	45.23	74.00	54.00	X/H
4947.65	V	45.29	39.73	5.74	51.03	45.47	74.00	54.00	X/H
7421.33	V	47.60	40.16	11.19	58.79	51.35	74.00	54.00	X/H

## Remark :

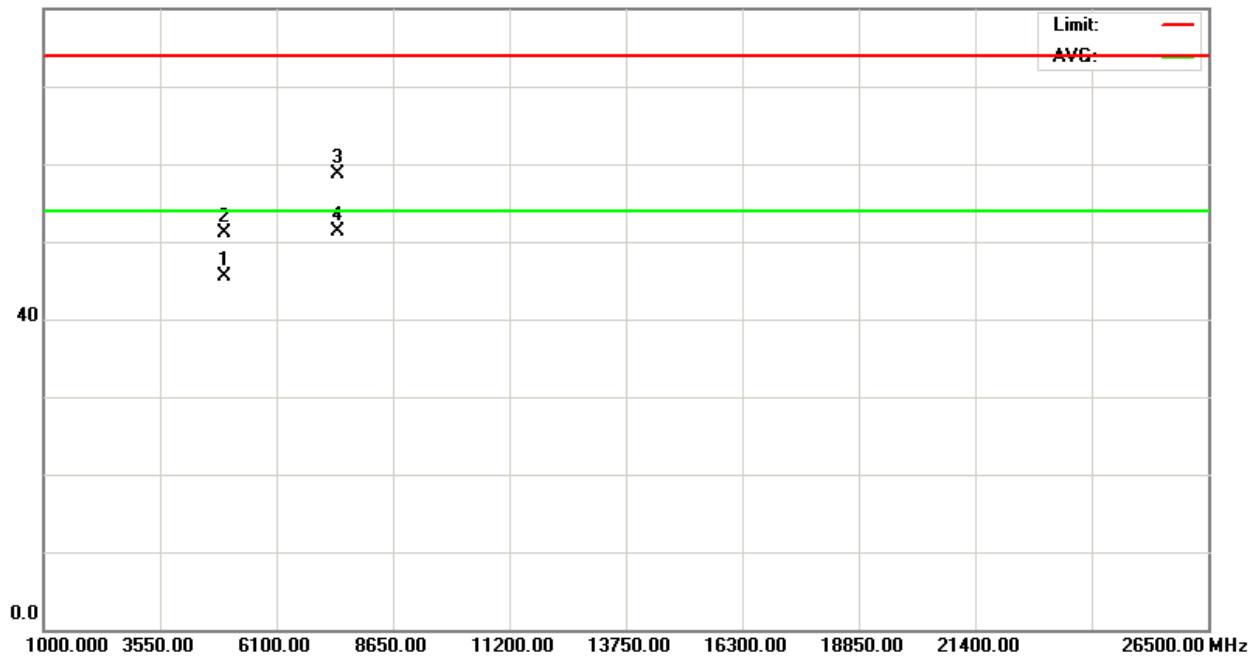
- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◎
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◎
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**TX CH18 (Above 1000 MHz, Vertical)**



80.0 dBuV/m



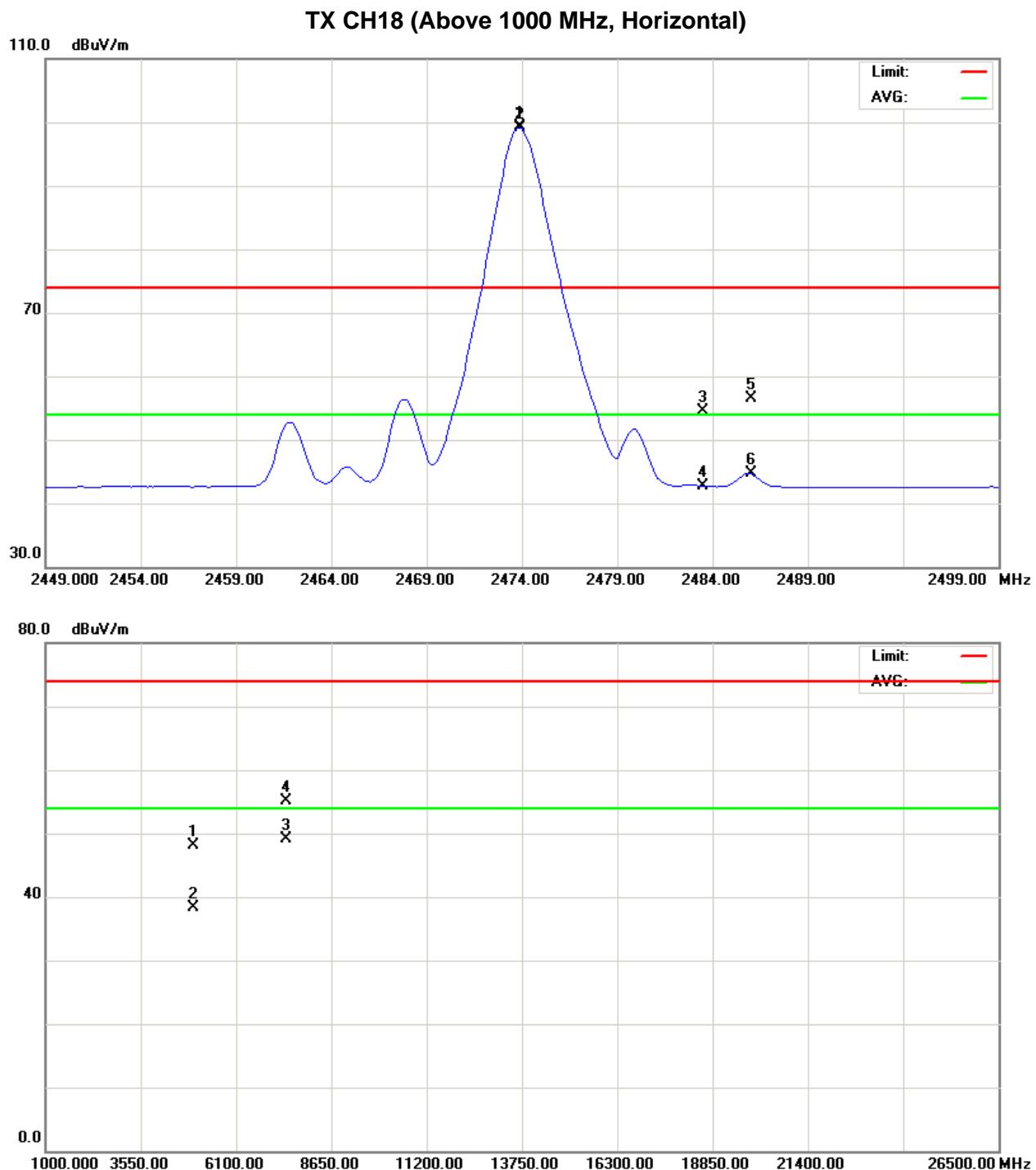


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX 2474MHz -CH18-5Mbps		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2473.88	H	67.51	67.33	31.81	99.32	99.14			X/F
2483.50	H	22.61	10.94	31.80	54.41	42.74	74.00	54.00	X/E
2486.00	H	24.67	12.87	31.80	56.47	44.67	74.00	54.00	X/H
4947.61	H	42.43	32.64	5.74	48.17	38.38	74.00	54.00	X/H
7421.48	H	43.84	37.96	11.19	55.03	49.15	74.00	54.00	X/H

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



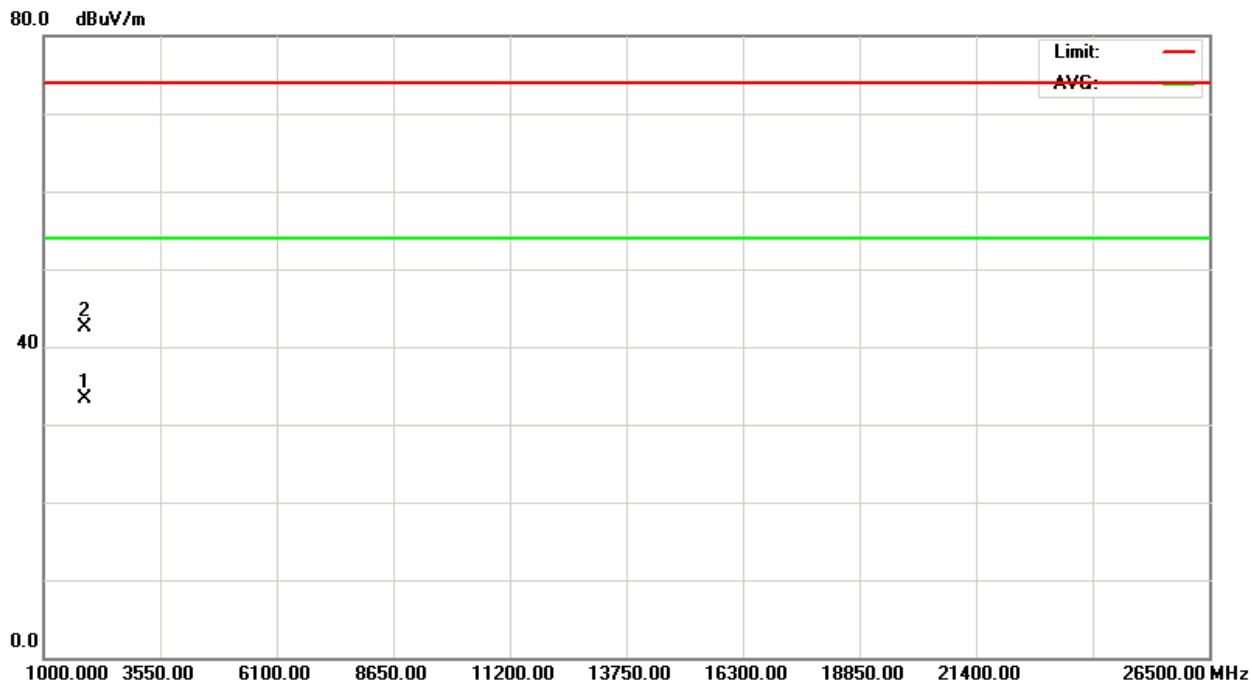


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2406MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1834.30	V	45.25	36.03	-2.74	42.51	33.29	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



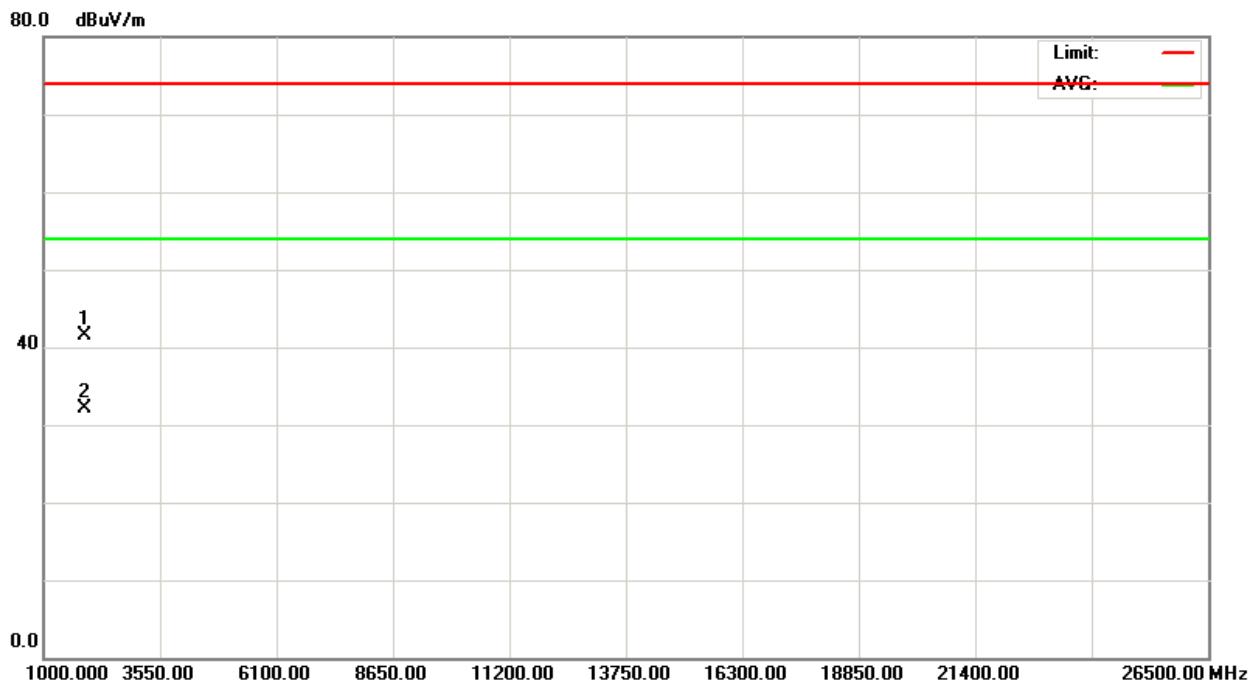


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2406MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1834.55	H	44.18	34.85	-2.73	41.45	32.12	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



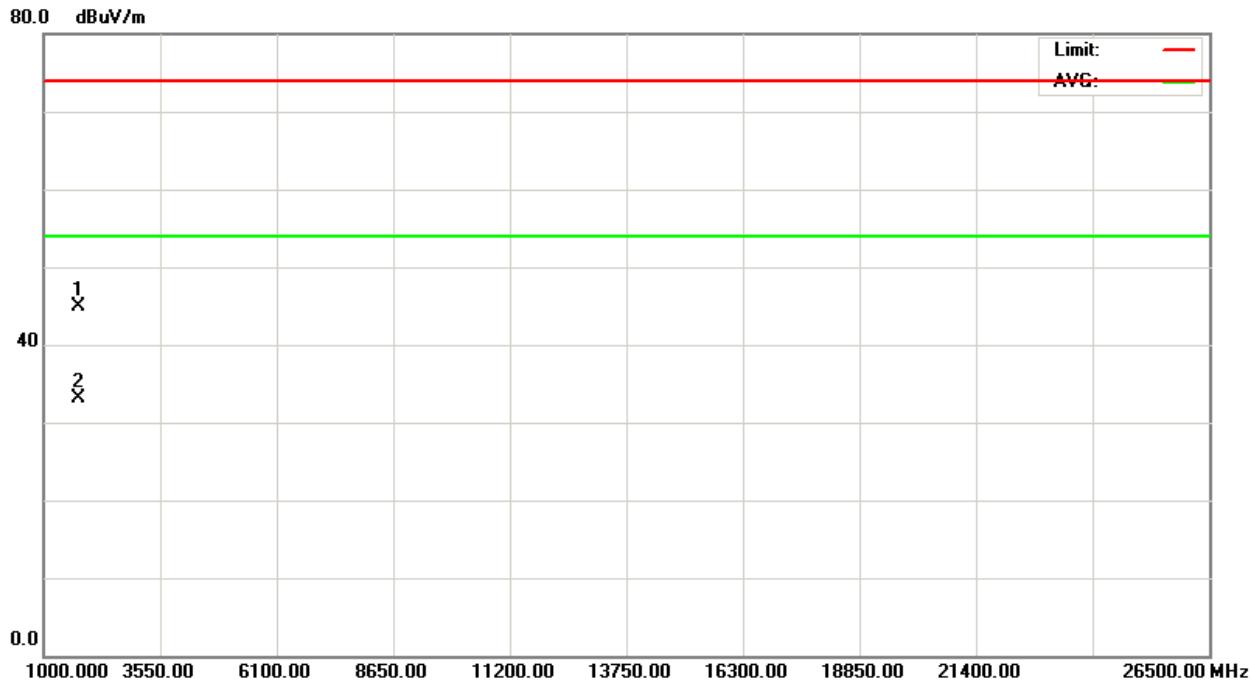


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2442MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1745.60	V	48.65	36.87	-3.71	44.94	33.16	74.00	54.00	X/H

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
  - "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



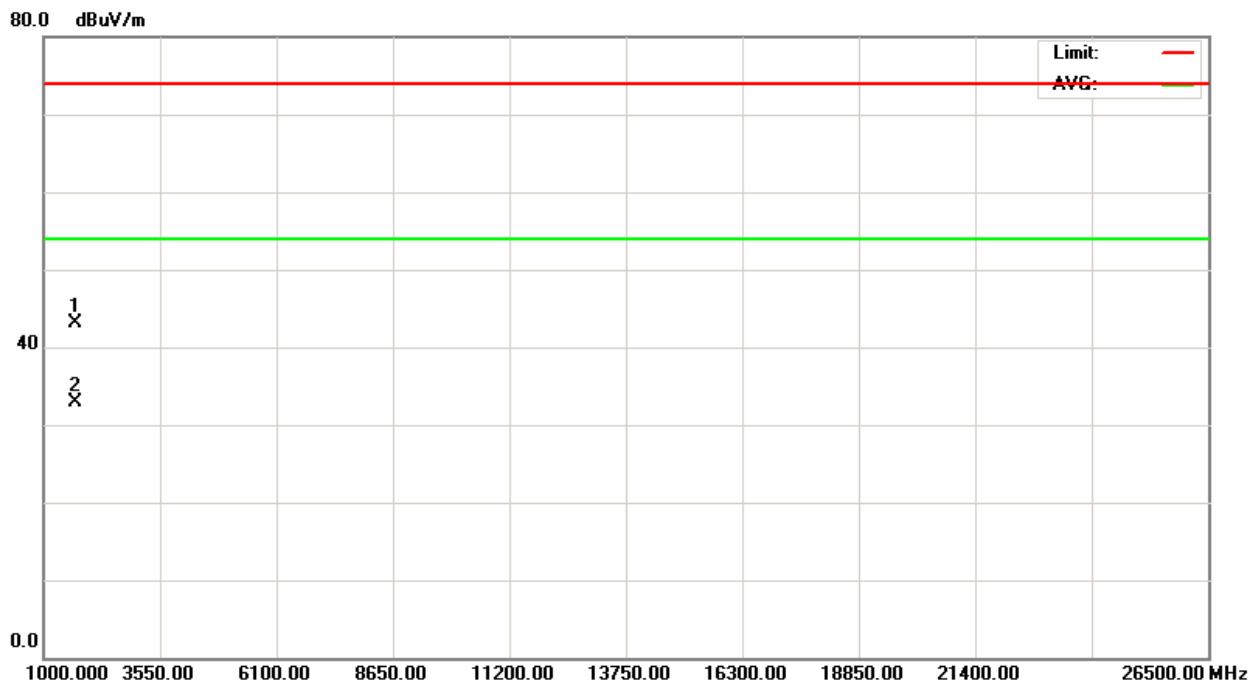


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2442MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1658.00	H	47.69	37.52	-4.67	43.02	32.85	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



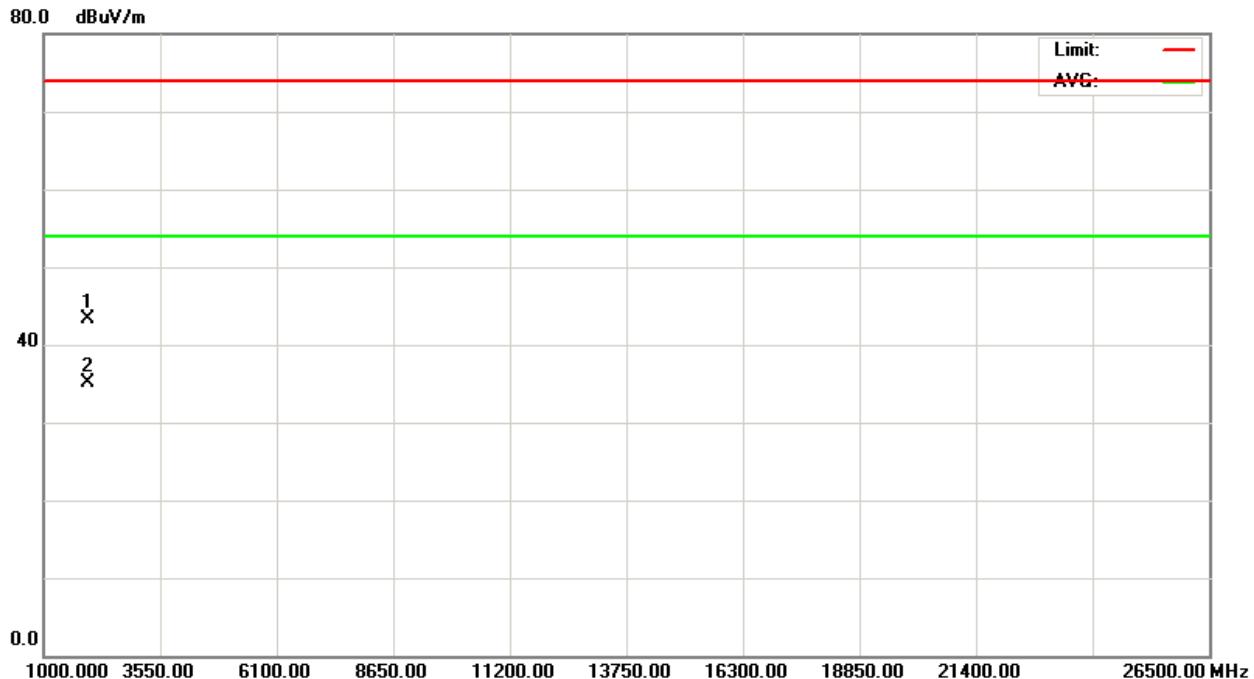


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2474MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1925.00	V	45.02	36.78	-1.73	43.29	35.05	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



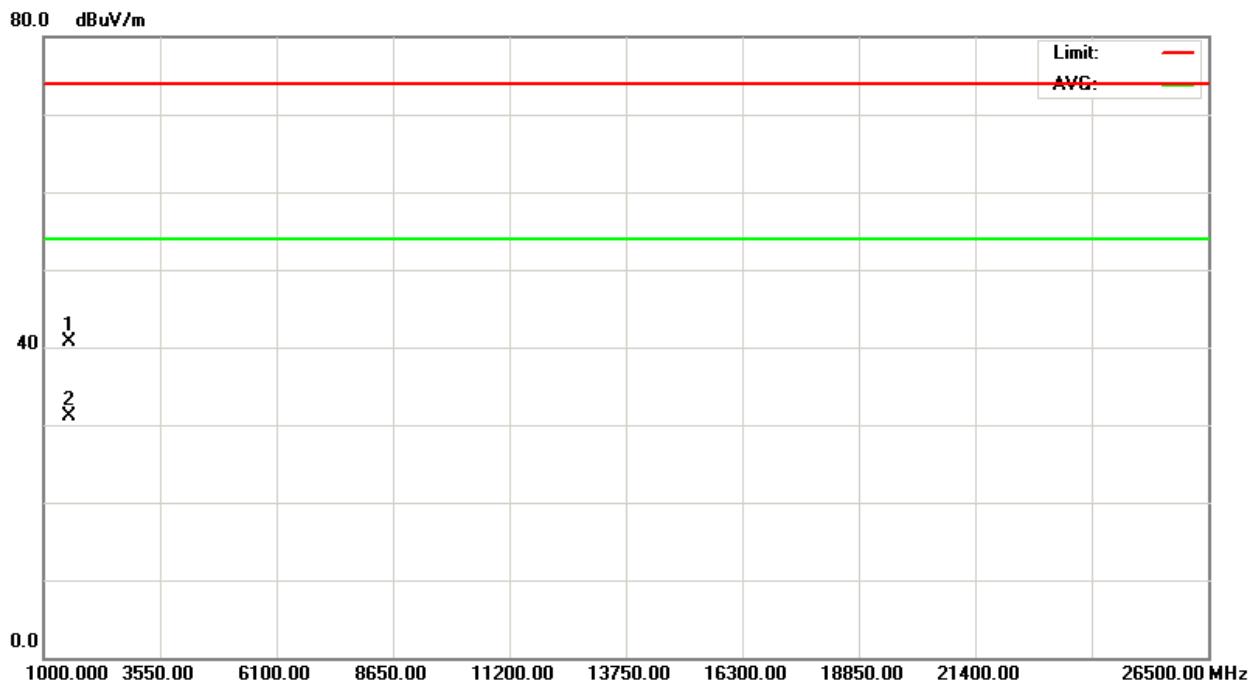


EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	RX Mode 2474MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1526.32	H	46.89	37.28	-6.13	40.76	31.15	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand





## 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

#### 5.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A " denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

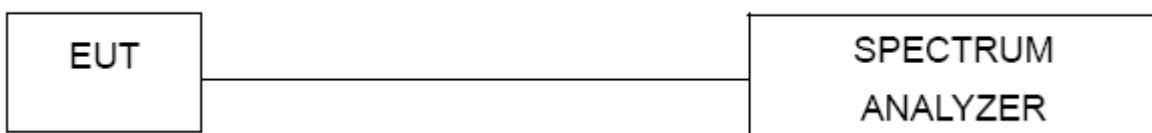
#### 5.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

#### 5.1.3 DEVIATION FROM STANDARD

No deviation.

#### 5.1.4 TEST SETUP



#### 5.1.5 EUT OPERATION CONDITIONS

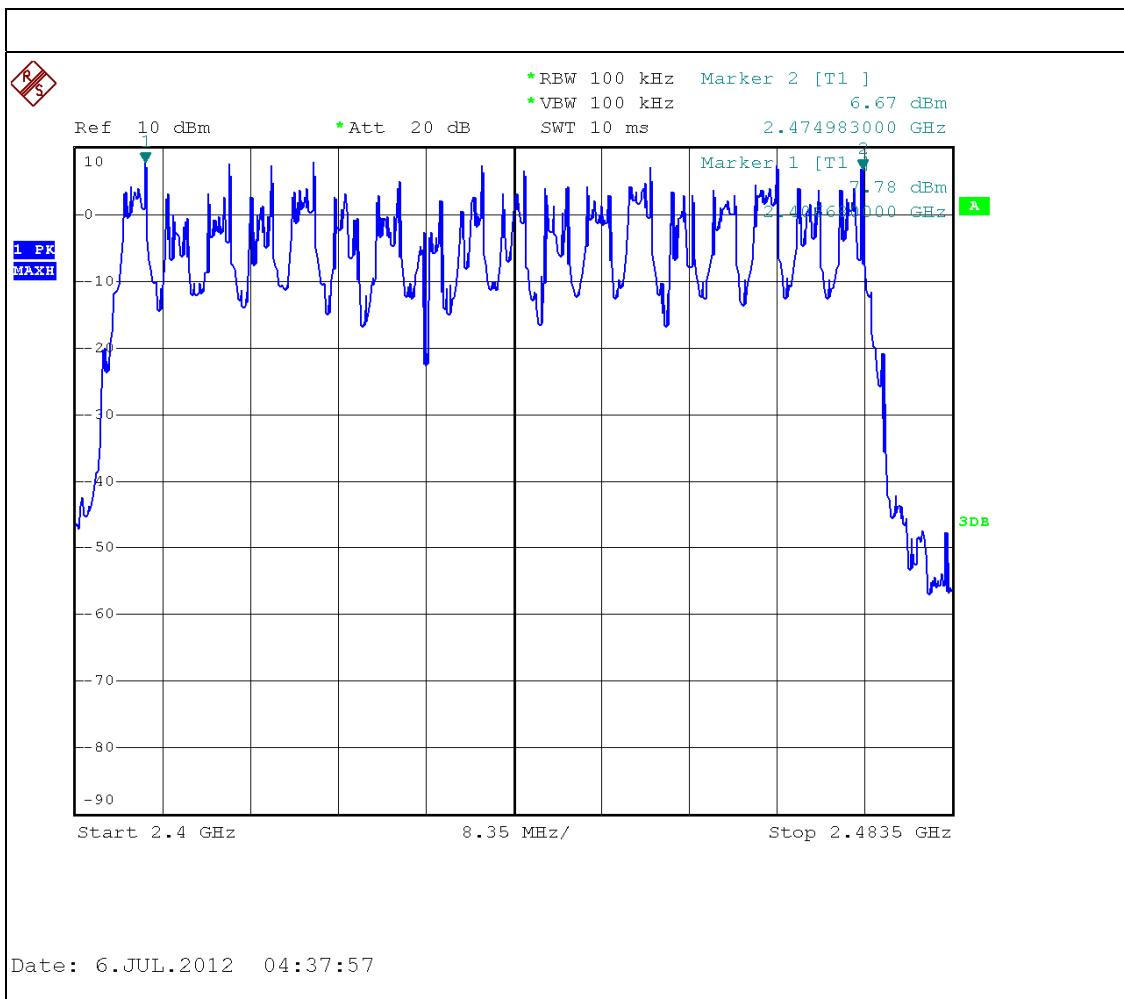
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



### 5.1.6 TEST RESULTS

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Hopping Mode -5Mbps		

Number of Hopping Channel	18
---------------------------	----





## 6. AVERAGE TIME OF OCCUPANCY

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

#### 6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

#### 6.1.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.

#### 6.1.3 DEVIATION FROM STANDARD

No deviation.



#### **6.1.4 TEST SETUP**



#### **6.1.5 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



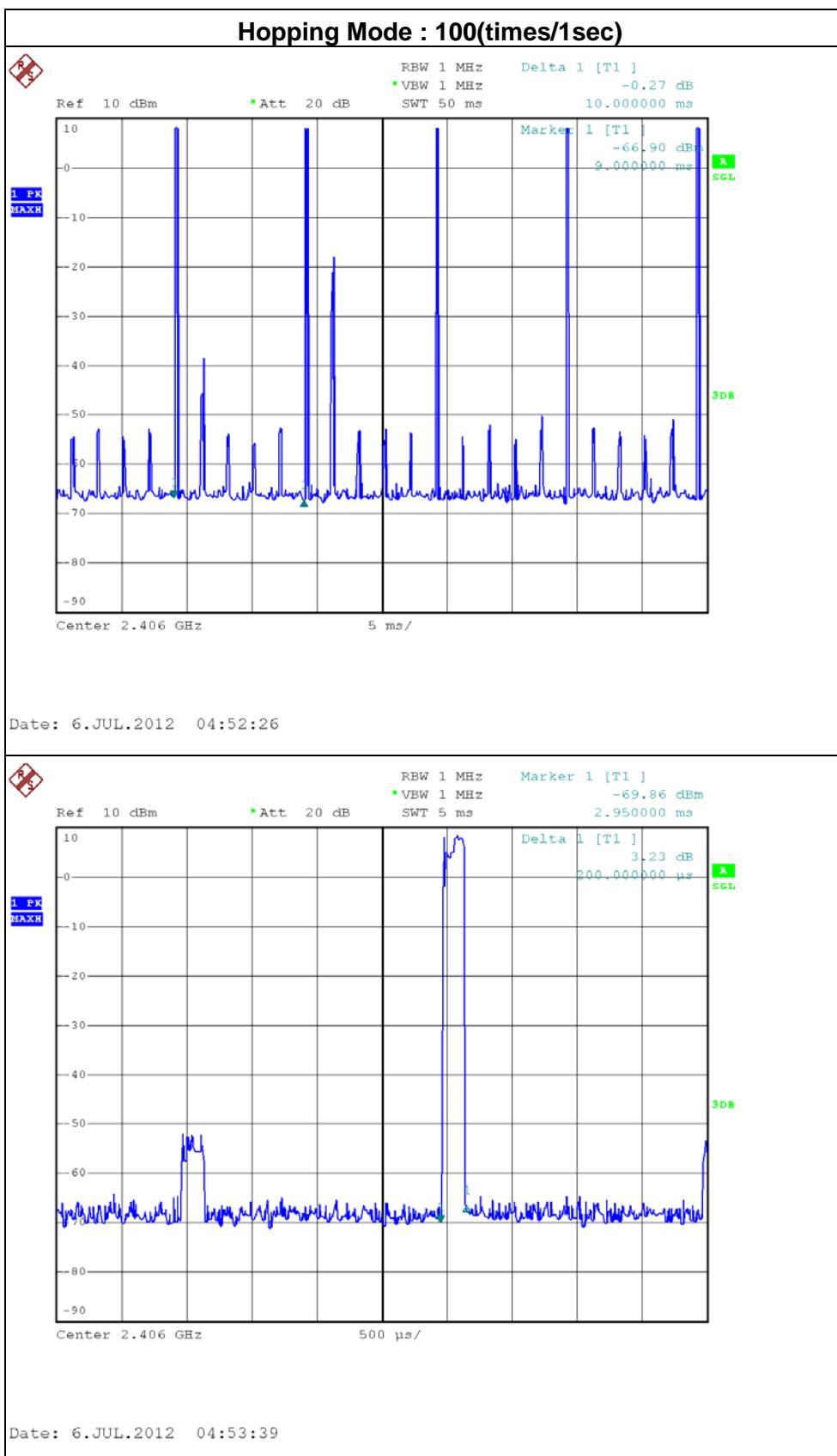
## 6.1.6 TEST RESULTS

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Hopping Mode		

Mode	Number of transmission in a 7.2(18Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
2406 MHz	(100/1) *7.2=720 times <b>Note1</b>	0.2	144	400

**Note1:** 5 times of occupied channels per 1 second

	Results
Measured cycle (sec)	18 CH*0.4=7.2
The total number of frequency-hopping per second	((100/1)*18)=1800
The number of occupied channels per second	1800/18=100(number/sec)
occupied time for each channel(1)	0.2ms
The total number of channels occupied within one cycle (2)	(100/1) *7.2=720 times
The average time of occupancy within one cycle(1)*(2)	144msec
LIMIT (msec)	400msec





## 7. HOPPING CHANNEL SEPARATION MEASUREMENT

### 7.1 APPLIED PROCEDURES / LIMIT

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.

#### 7.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

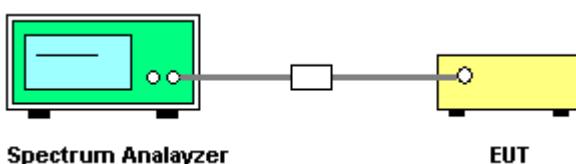
#### 7.1.2 TEST PROCEDURE

- The EUT must have its hopping function enabled
- Span = wide enough to capture the peaks of two adjacent channels  
Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span  
Video (or Average) Bandwidth (VBW)  $\geq$  RBW  
Sweep = auto  
Detector function = peak  
Trace = max hold

#### 7.1.3 DEVIATION FROM STANDARD

No deviation.

#### 7.1.4 TEST SETUP



#### 7.1.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in hopping mode.

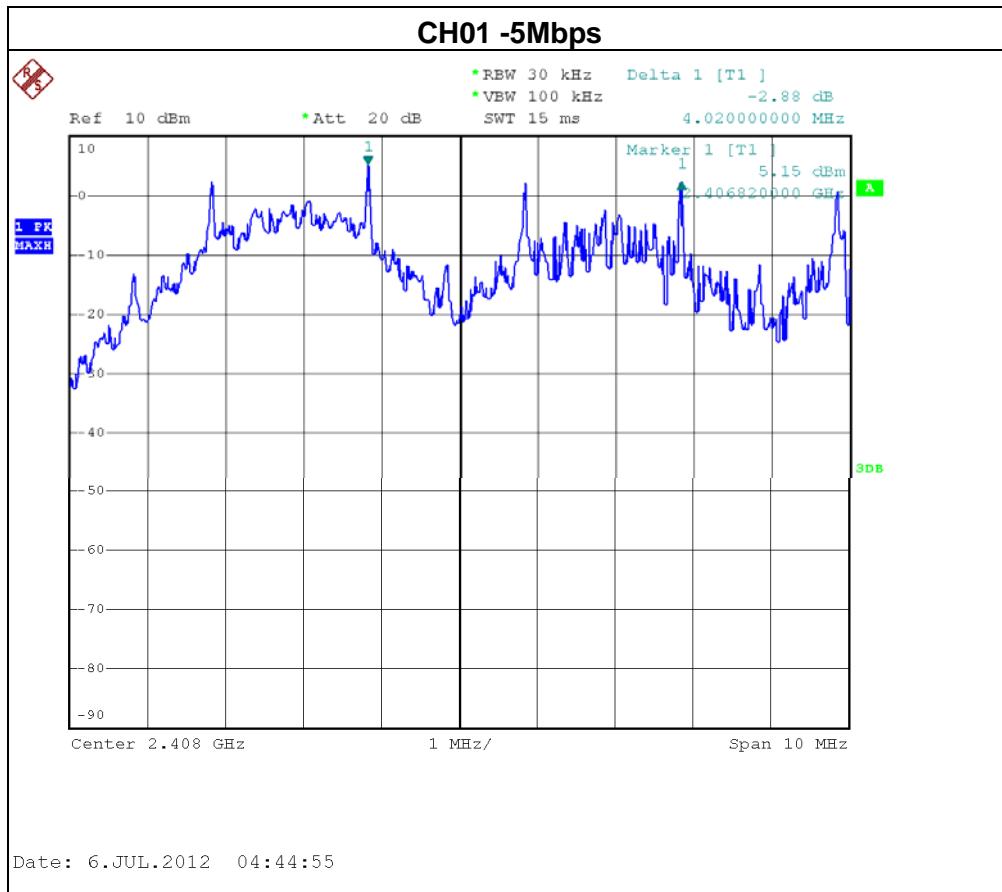


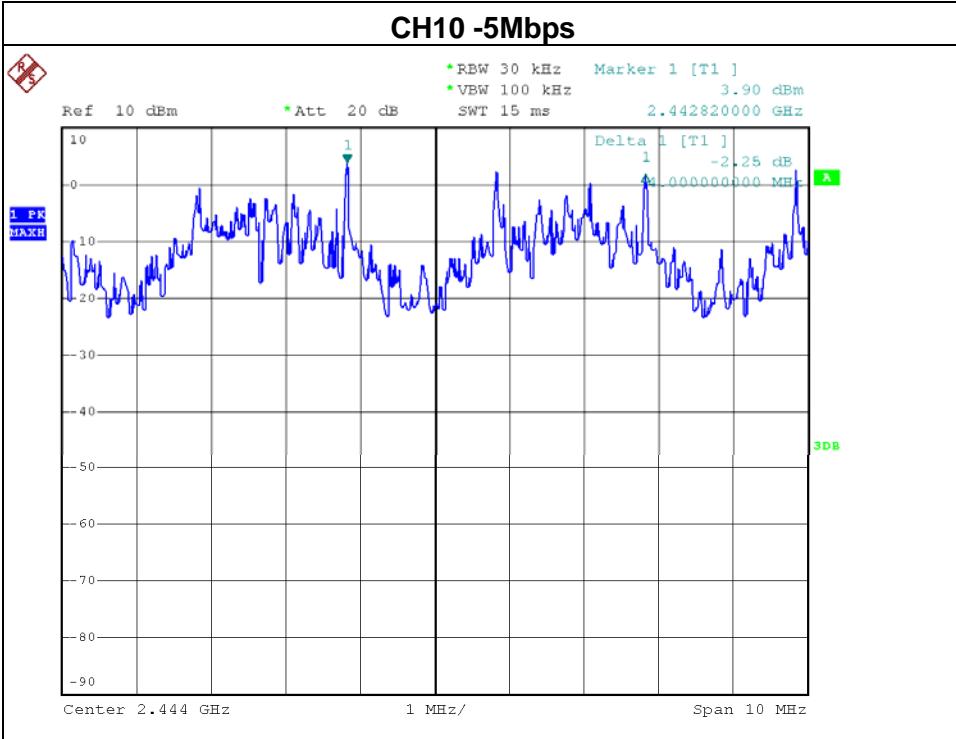
## 7.1.6 TEST RESULTS

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	CH01 / CH10 /CH18-5Mbps		

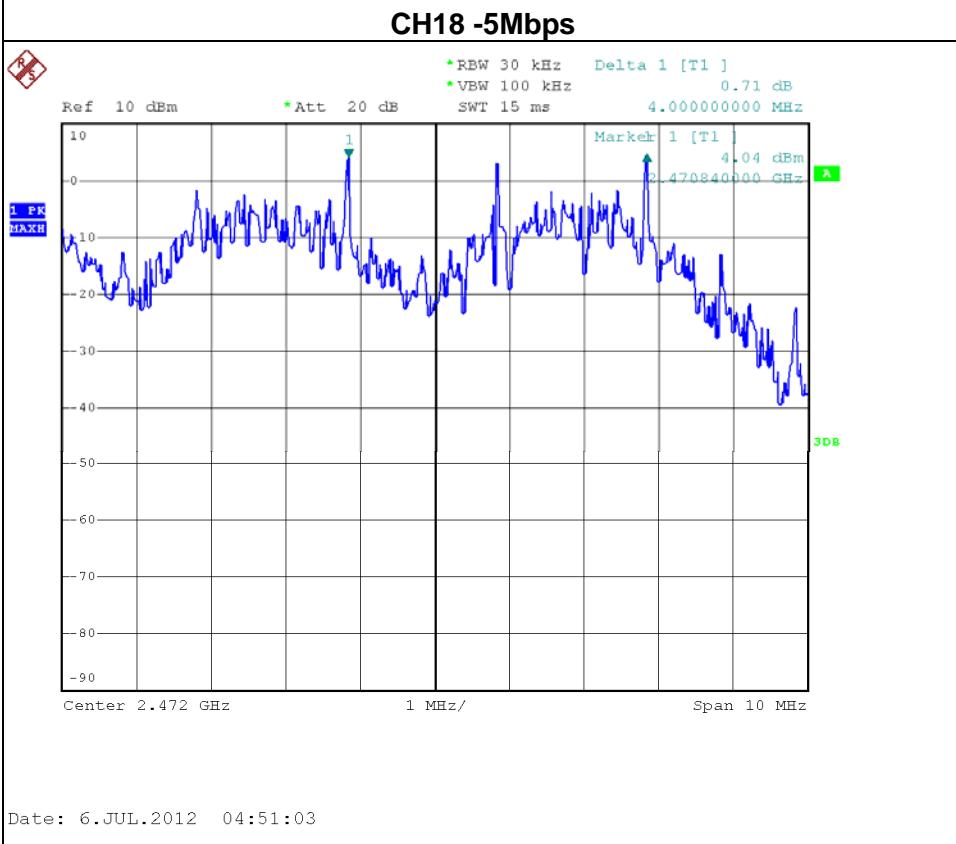
Frequency	Ch. Separation (MHz)	20dB Bandwidth (MHz)	Result
2406 MHz	4.020	4.160	Complies
2442 MHz	4.000	4.200	Complies
2474 MHz	4.000	4.100	Complies

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth





Date: 6.JUL.2012 04:46:57



Date: 6.JUL.2012 04:51:03



## 8. BANDWIDTH TEST

### 8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(2)	Bandwidth	<= 1 MHz (20dB bandwidth)	2400-2483.5	PASS

#### 8.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 8.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

#### 8.1.3 DEVIATION FROM STANDARD

No deviation.

#### 8.1.4 TEST SETUP



#### 8.1.5 EUT OPERATION CONDITIONS

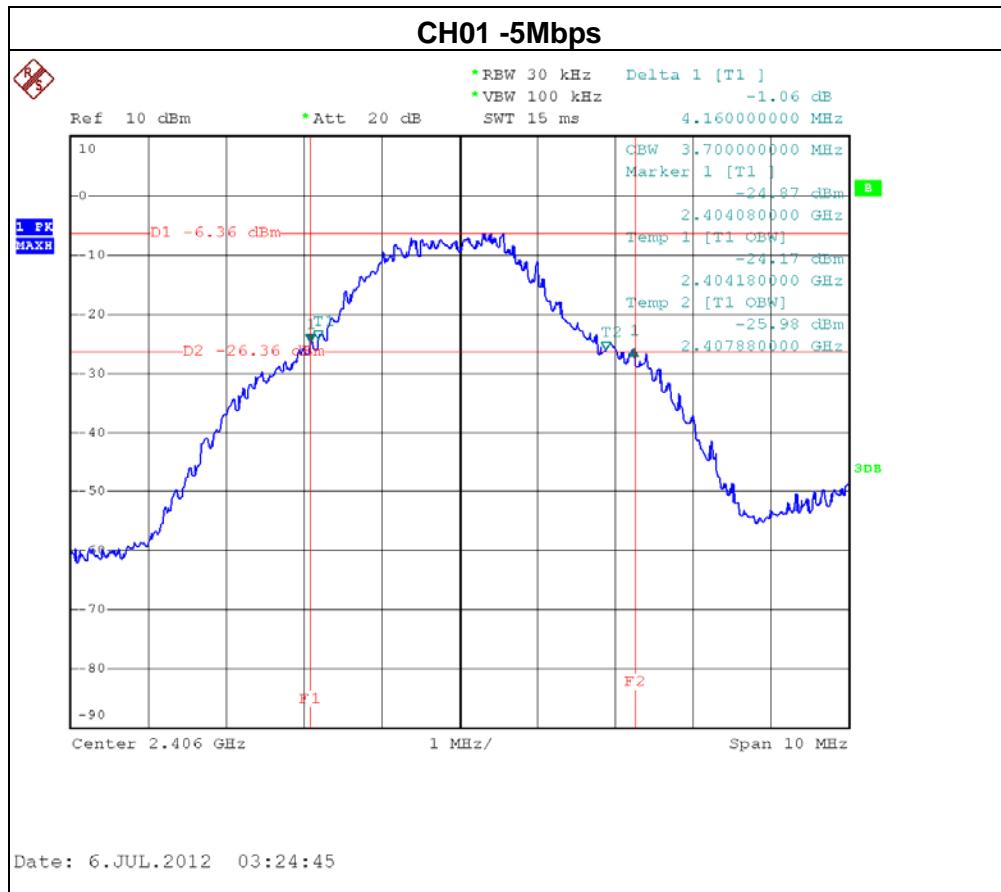
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

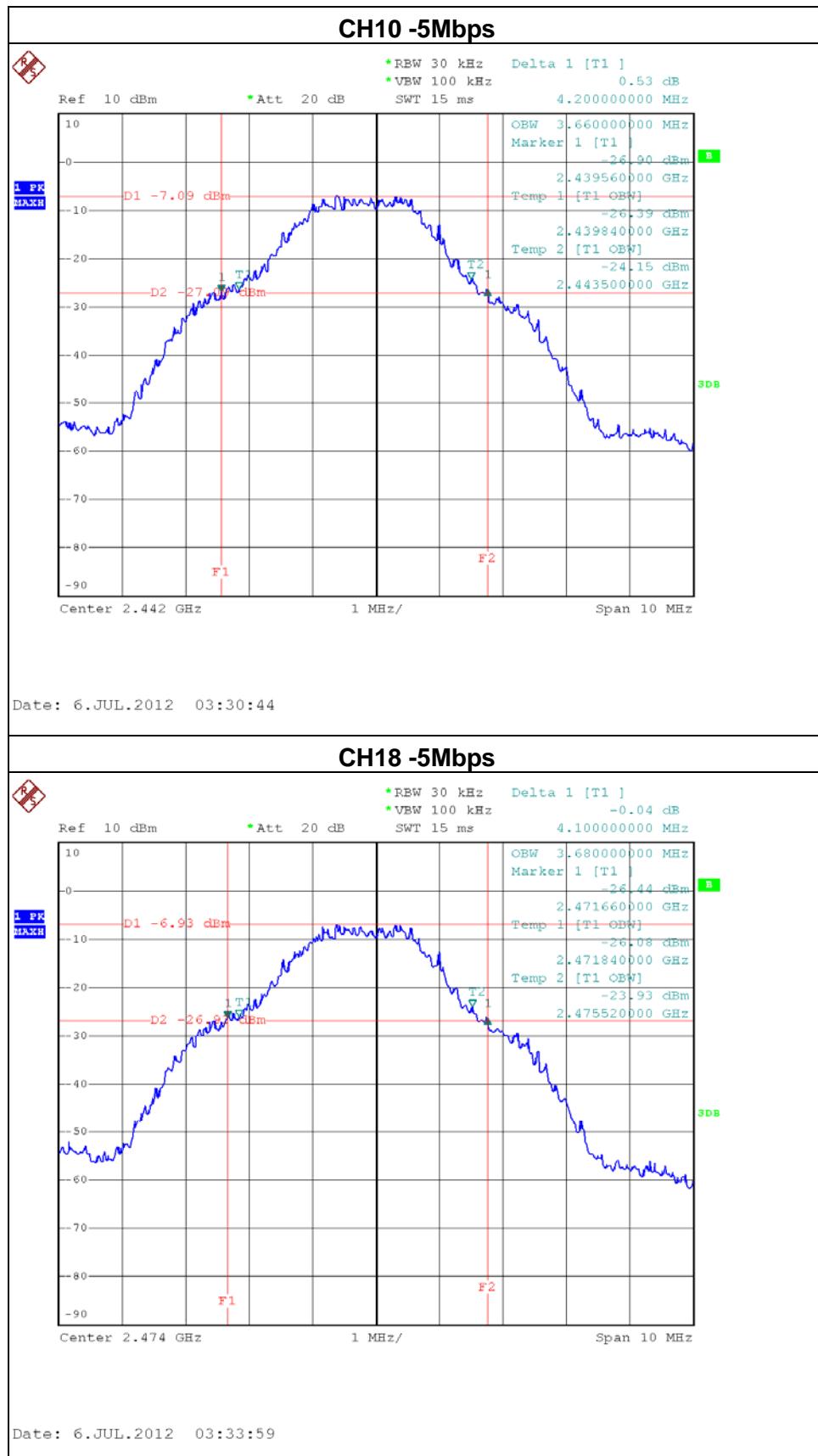


## 8.1.6 TEST RESULTS

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	CH01 / CH10 /CH18-5Mbps		

Frequency	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Result
2406 MHz	4.160	3.70	PASS
2442 MHz	4.200	3.66	PASS
2474 MHz	4.100	3.68	PASS







## 9. PEAK OUTPUT POWER TEST

### 9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

#### 9.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A " denotes No Model Name , Serial No. or No Calibration specified.

#### 9.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

#### 9.1.3 DEVIATION FROM STANDARD

No deviation.

#### 9.1.4 TEST SETUP



#### 9.1.5 EUT OPERATION CONDITIONS

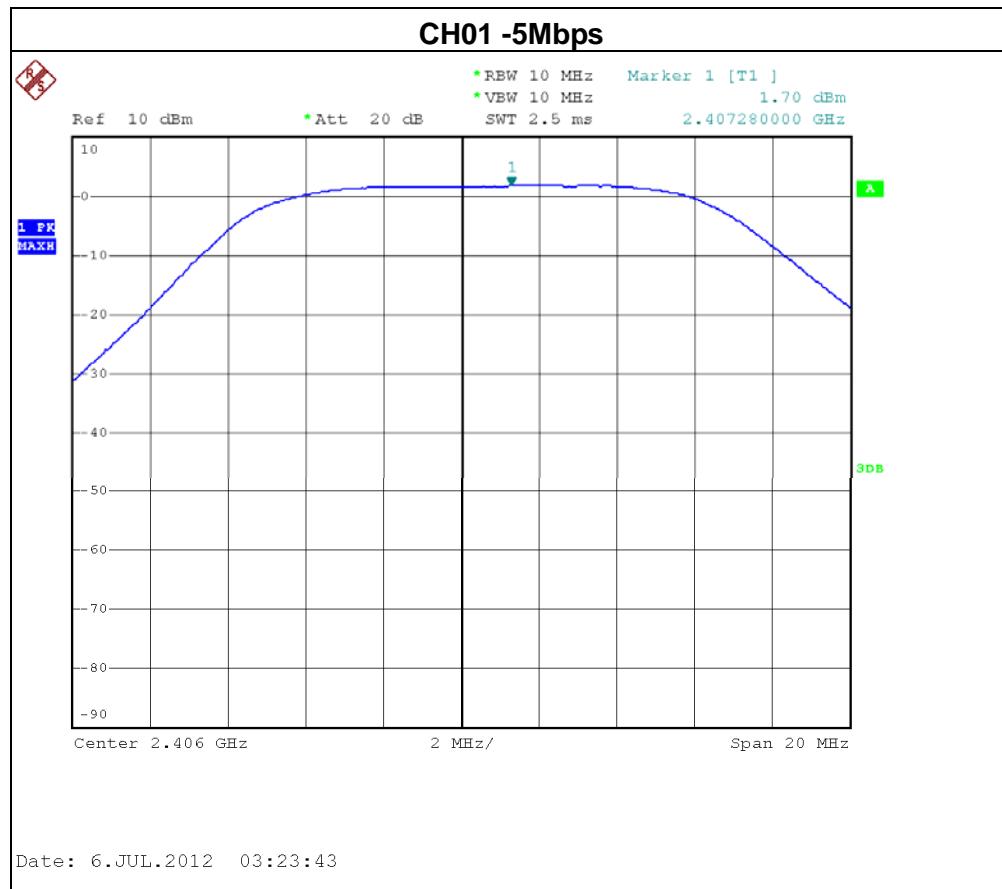
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

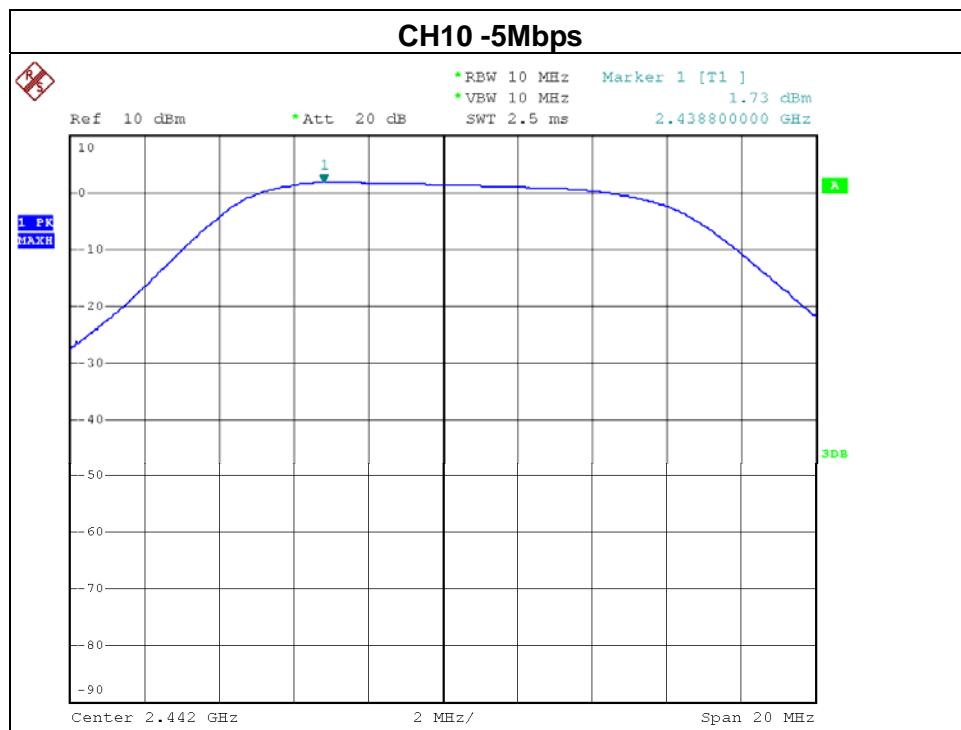


## 9.1.6 TEST RESULTS

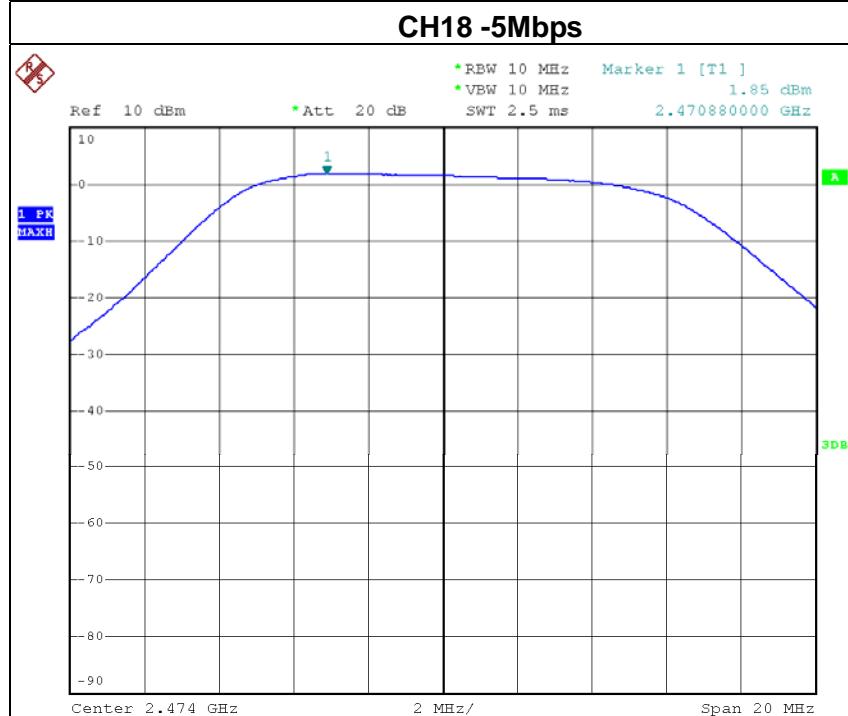
EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	CH01/ CH10 /CH18 -5Mbps		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2406	1.70	21	0.125
CH10	2442	1.73	21	0.125
CH18	2474	1.85	21	0.125





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## 10. ANTENNA CONDUCTED SPURIOUS EMISSION

### 10.1 APPLIED PROCEDURES / LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### 10.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

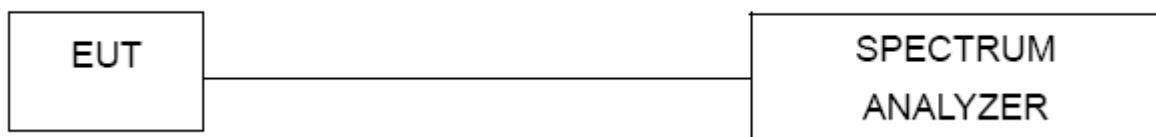
#### 10.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

#### 10.1.3 DEVIATION FROM STANDARD

No deviation.

#### 10.1.4 TEST SETUP



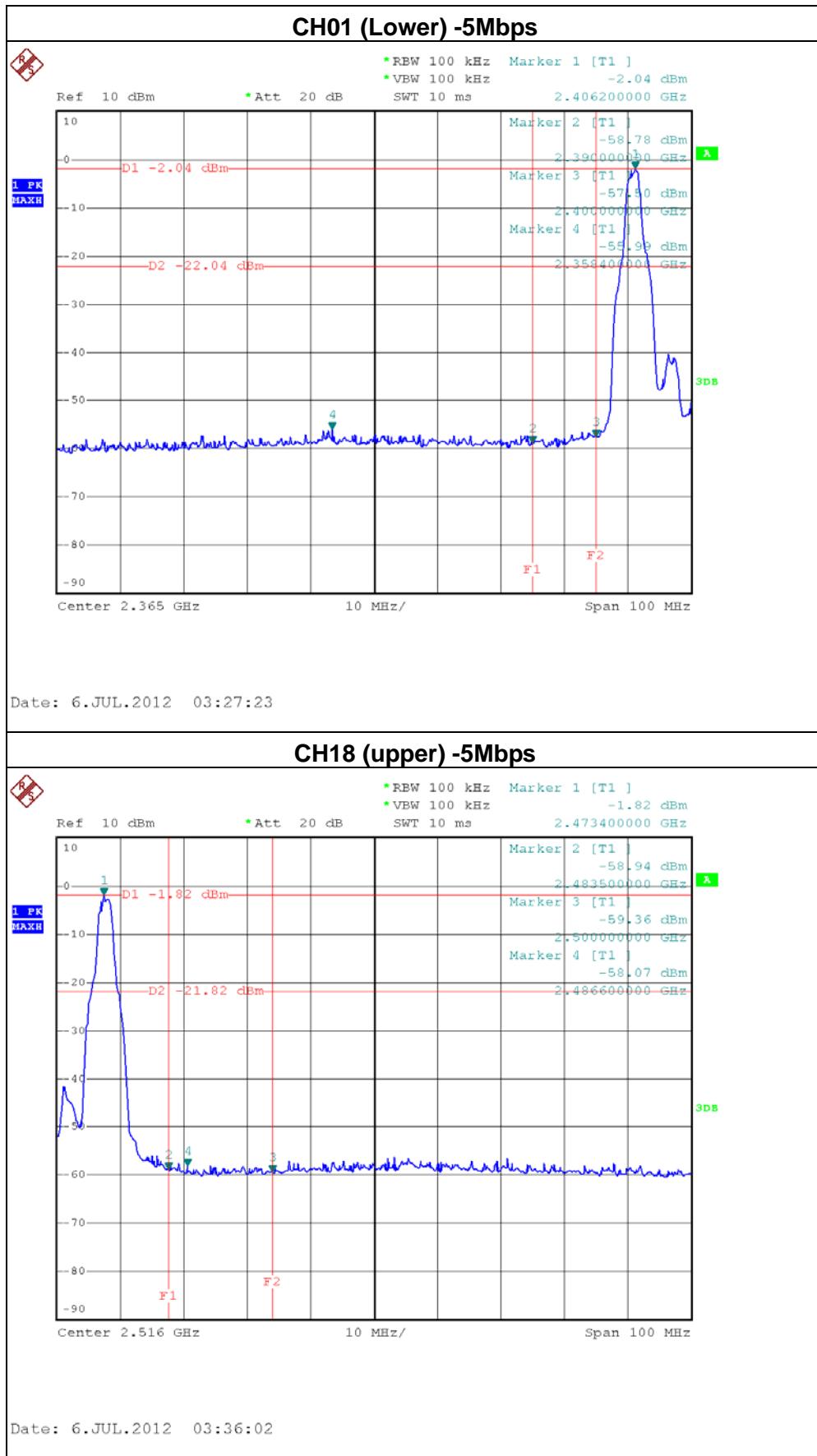
#### 10.1.5 EUT OPERATION CONDITIONS

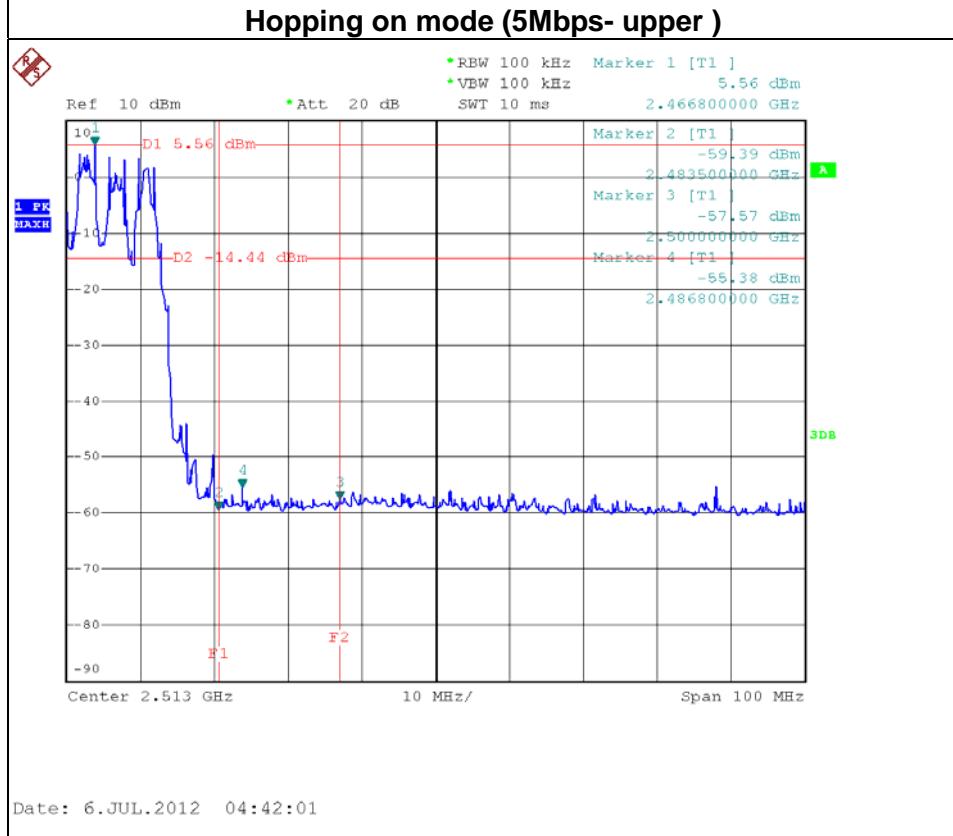
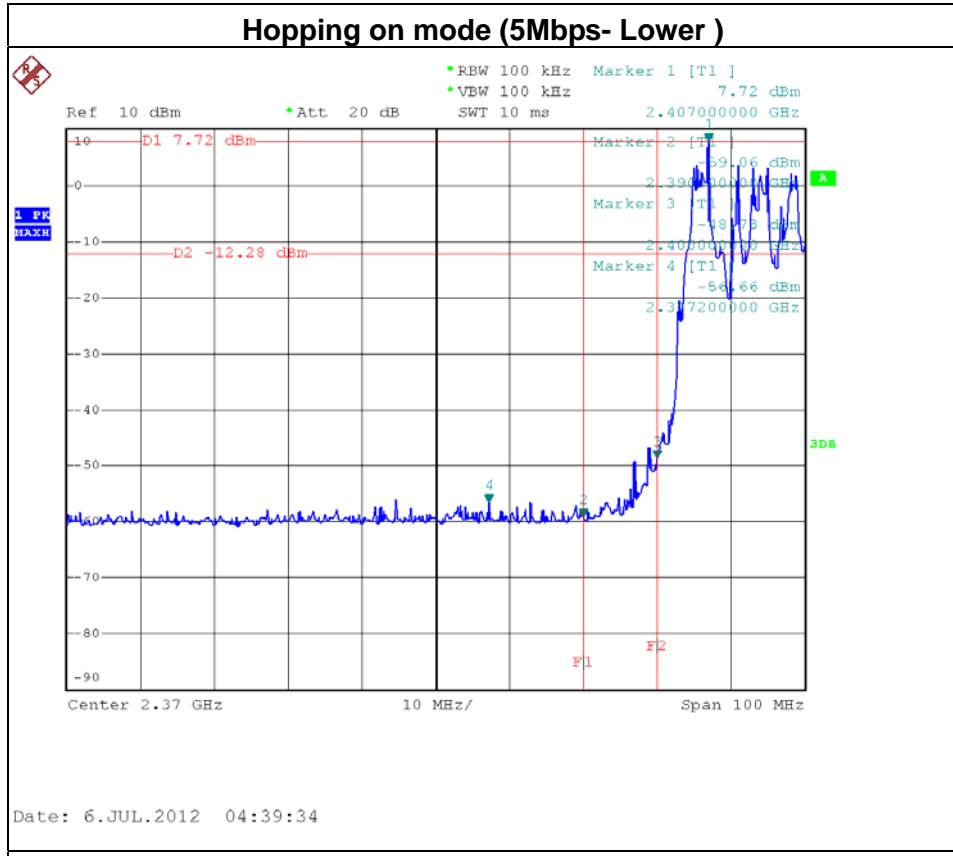
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

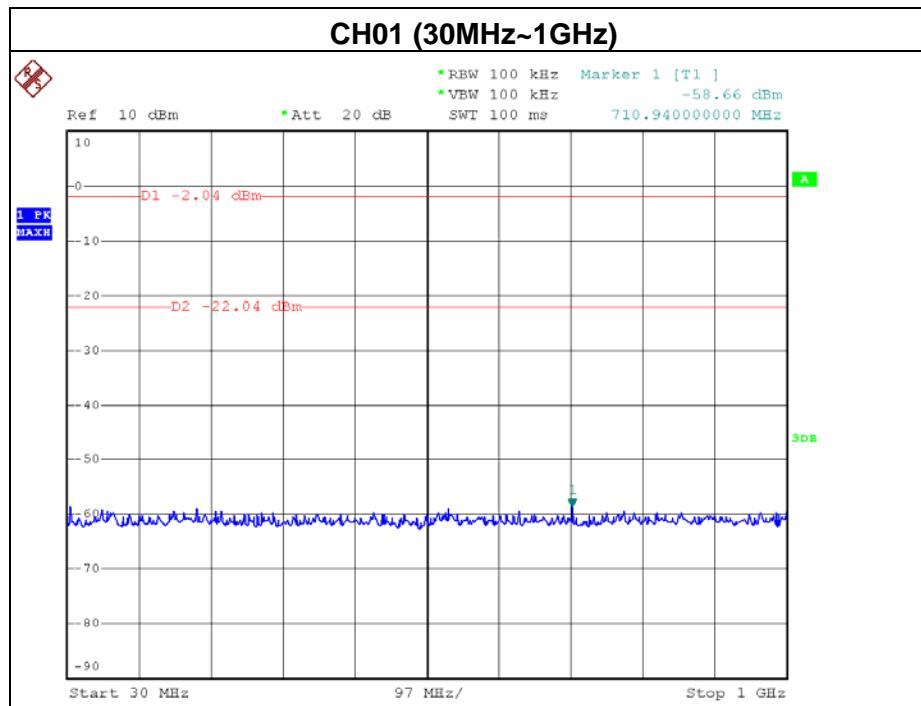
**10.1.6 TEST RESULTS**

EUT :	TX Wireless Speaker System	Model Name :	Tvee®26
Temperature :	25 °C	Relative Humidity :	58 %
Pressure :	1009 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	CH01 / CH10/ CH18-5Mbps & Hopping on mode (5Mbps)		

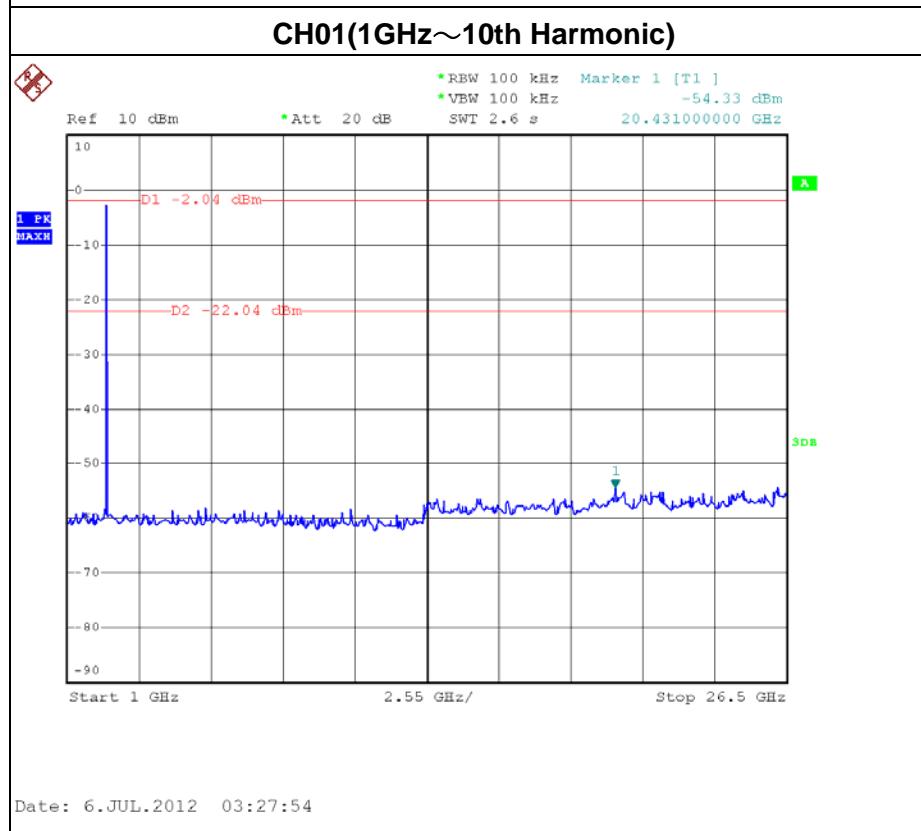
The max. radio frequency power in any 100kHz bandwidth within the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-57.50	2486.60	-58.07
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			



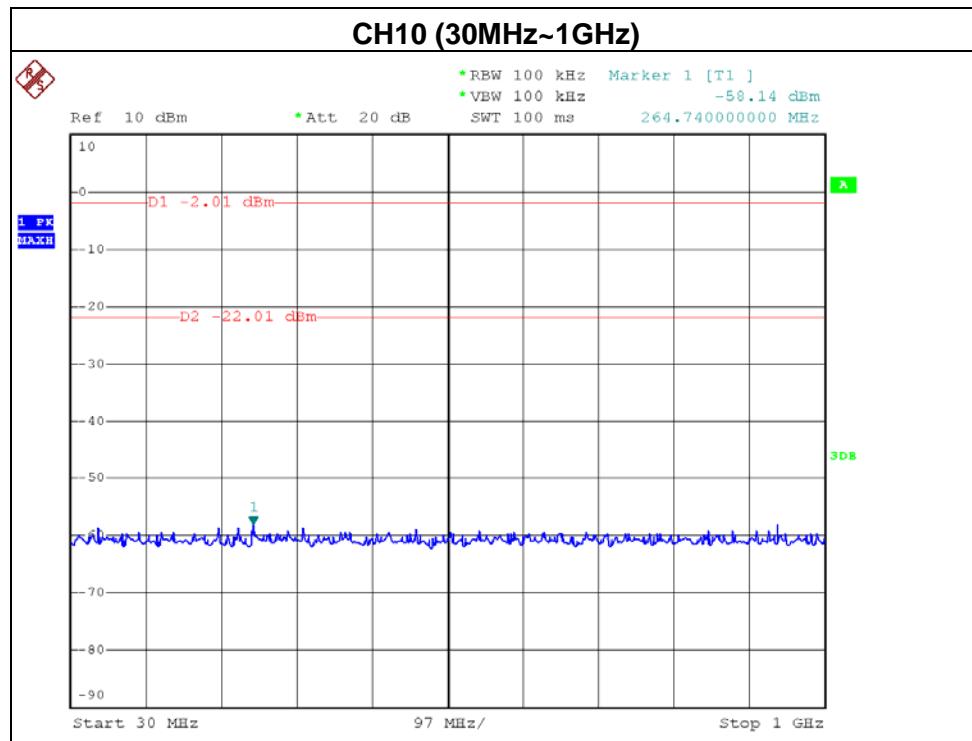




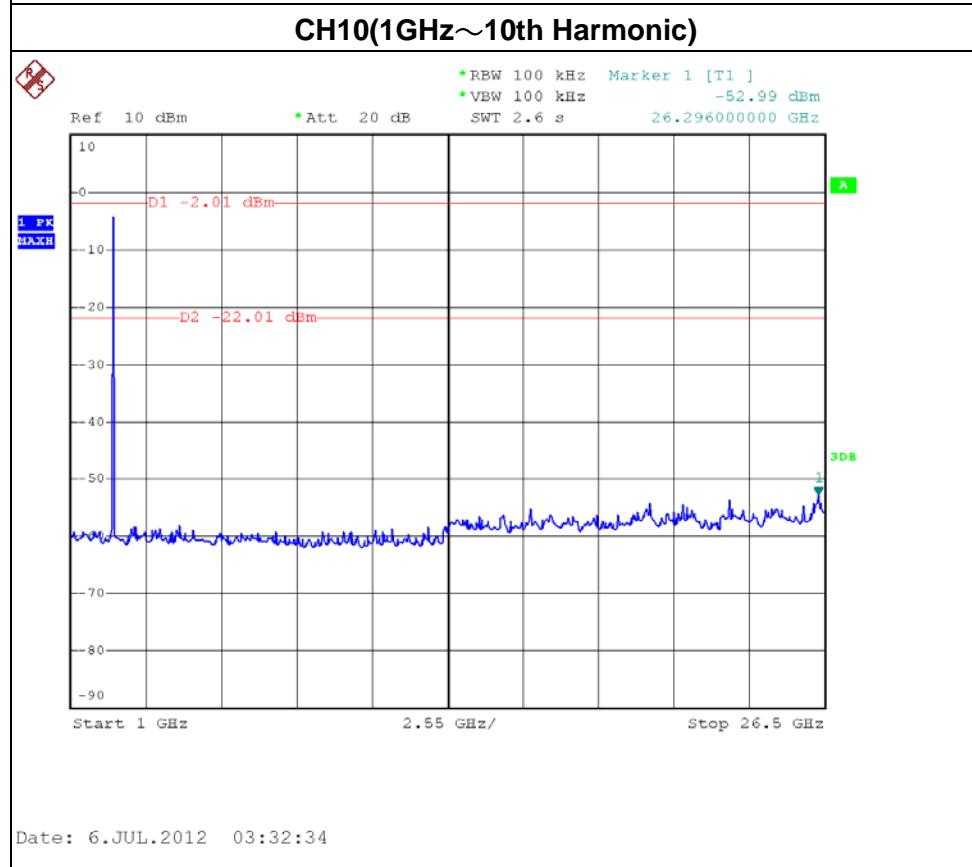
Date: 6.JUL.2012 03:27:41



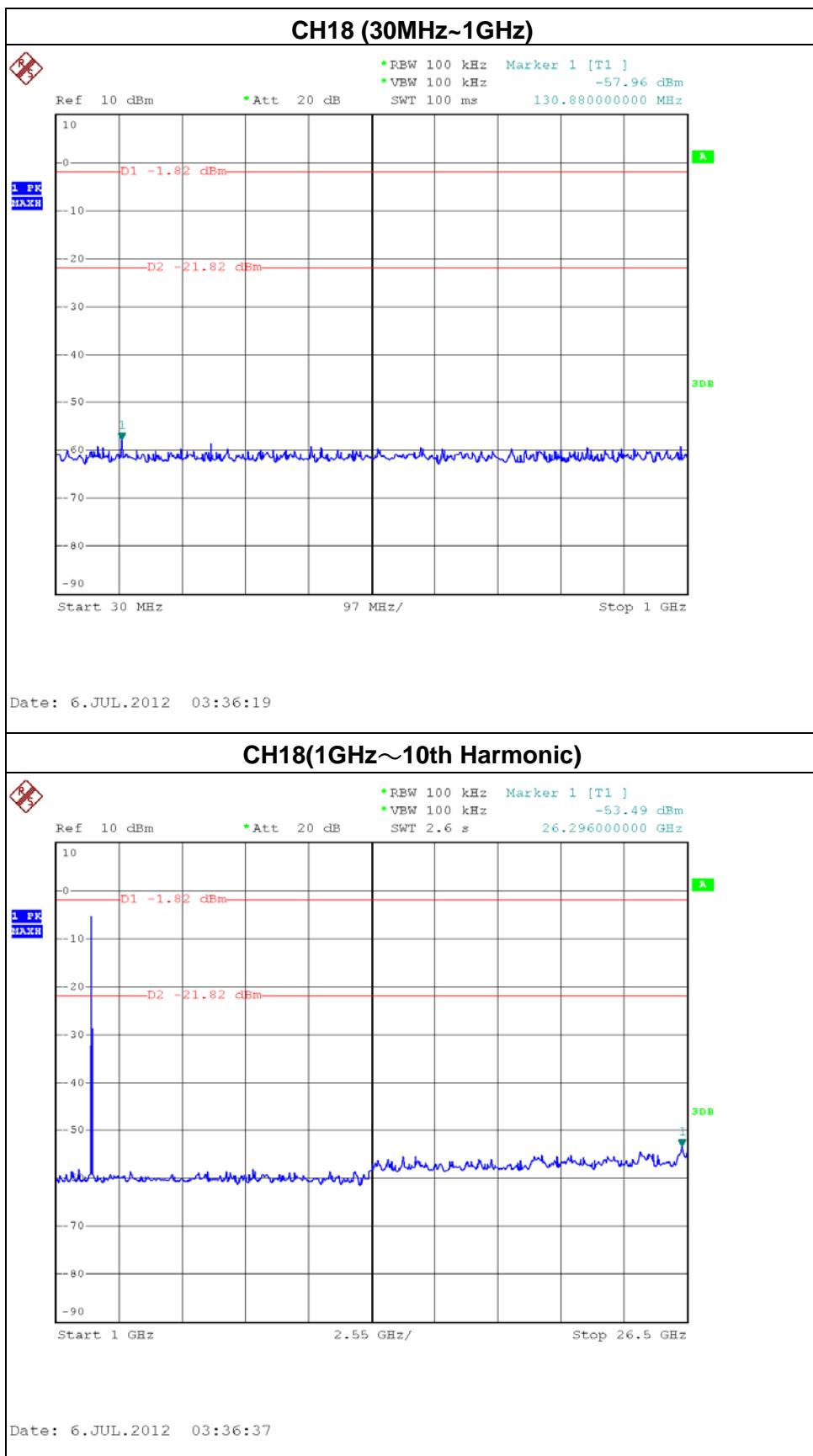
Date: 6.JUL.2012 03:27:54



Date: 6.JUL.2012 03:32:21



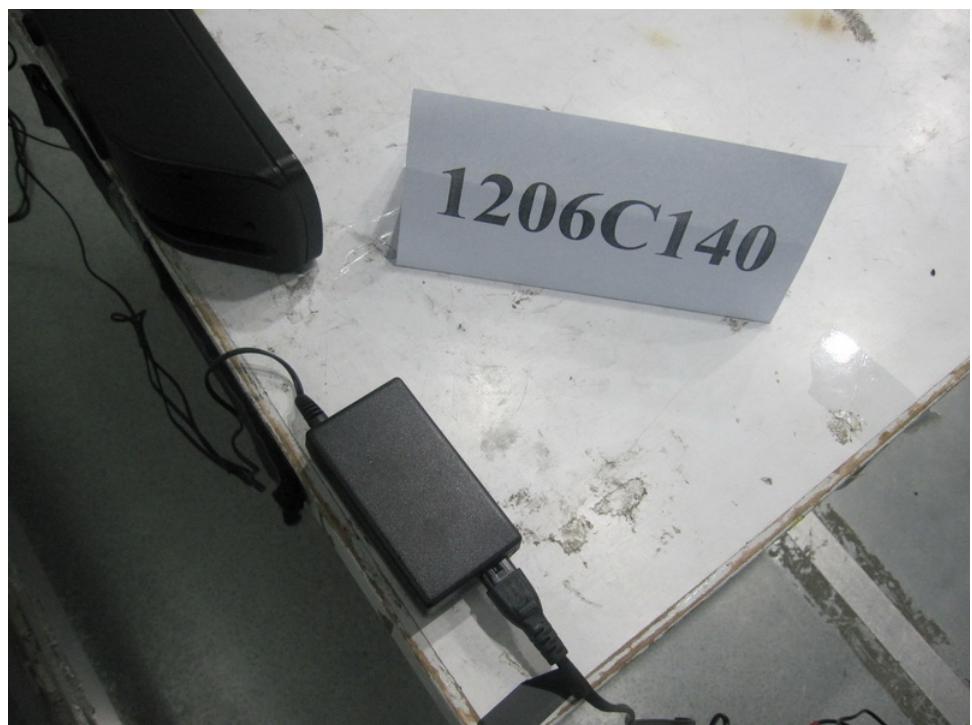
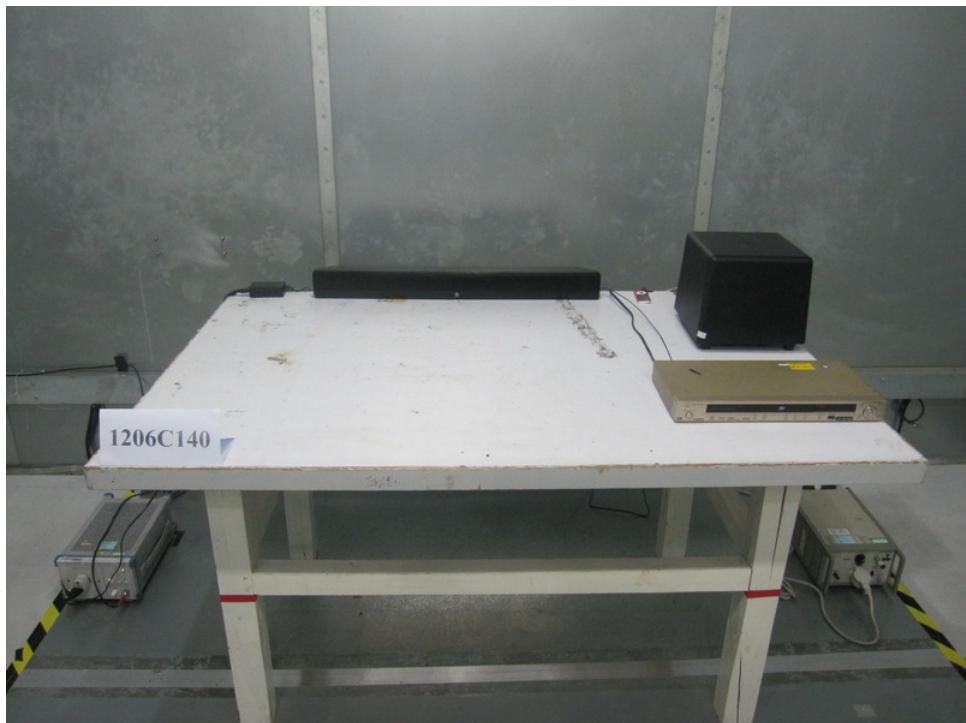
Date: 6.JUL.2012 03:32:34





**11. EUT TEST PHOTO**

**Conducted Measurement Photos**





**Radiated Measurement Photos**

