

# CE EMC Test Report



(Declaration of Conformity)

For

Electromagnetic Interference

Of

**Product :** 5.1MULTIMEDIA SPEAKER

**Trade Name :** F&D

**Model Number :** F6000U

**Prepared for**

SHENZHEN FENDA TECHNOLOGY CO., LTD.

Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District,  
Shenzhen City, Guangdong, China

**Prepared by**

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street,  
Bao'an District, Shenzhen P.R. China

Tel.: +86-0755-61156588 Fax.: +86-0755-61156599

Website: [www.ntek.org.cn](http://www.ntek.org.cn)

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : SHENZHEN FENDA TECHNOLOGY CO., LTD.  
**Address** ..... : Fenda Hi-Tech Park, Zhoushi Road, Shiyao Town, Baoan District,  
Shenzhen City, Guangdong, China  
**Manufacturer's Name** ..... : SHENZHEN FENDA TECHNOLOGY CO., LTD.  
**Address** ..... : Fenda Hi-Tech Park, Zhoushi Road, Shiyao Town, Baoan District,  
Shenzhen City, Guangdong, China  
**Product description**  
**Product name** ..... : 5.1MULTIMEDIA SPEAKER  
**Model and/or type reference** : F6000U  
EN 55013:2013  
EN 55020:2007+A11:2011  
**Standards** ..... : EN 61000-3-2:2006+A1:2009+A2:2009  
EN 61000-3-3:2013

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the 2004/108/EC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

**Date of Test** ..... :  
**Date (s) of performance of tests** ..... : 04 Mar. 2014 ~13 Mar. 2014  
**Date of Issue** ..... : 13 Mar. 2014  
**Test Result** ..... : **Pass**

**Testing Engineer** : Brews Xu  
(Brews Xu)

**Technical Manager** : Jim He  
(Jim He)

**Authorized Signatory** : Bovey Yang  
(Bovey Yang)



Table of Contents	Page
1 . TEST SUMMARY	6
1.1 TEST FACILITY	7
1.2 MEASUREMENT UNCERTAINTY	7
2 . GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
2.2 DESCRIPTION OF TEST MODES	9
2.3 DESCRIPTION OF TEST SETUP	10
2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL	11
2.5 MEASUREMENT INSTRUMENTS LIST	12
3 . EMC EMISSION TEST	15
3.1 CONDUCTED EMISSION MEASUREMENT	15
3.1.1 POWER LINE CONDUCTED EMISSION	15
3.1.2 TEST PROCEDURE	16
3.1.3 TEST SETUP	16
3.1.4 EUT OPERATING CONDITIONS	16
3.1.5 TEST RESULTS	17
3.2 RADIATED EMISSION MEASUREMENT	27
3.2.5 TEST PROCEDURE	28
3.2.6 TEST SETUP	29
3.2.7 EUT OPERATING CONDITIONS	30
3.2.8 TEST RESULTS(30-1000MHz)	31
3.2.9 TEST RESULTS(30-300MHz)	37
3.3 HARMONICS CURRENT	43
3.3.1 LIMITS OF HARMONICS CURRENT	43
3.3.1.1 TEST PROCEDURE	44
3.3.1.2 EUT OPERATING CONDITIONS	44
3.3.1.3 TEST SETUP	44
3.3.2 TEST RESULTS	45
3.4 VOLTAGE FLUCTUATION AND FLICKERS	51
3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS	51
3.4.1.1 TEST PROCEDURE	51
3.4.1.2 EUT OPERATING CONDITIONS	51
3.4.1.3 TEST SETUP	51
3.4.2 TEST RESULTS	52
4 . EMC IMMUNITY TEST	53
4.1 GENERAL PERFORMANCE CRITERIA	53

Table of Contents	Page
4.2 GENERAL PERFORMANCE CRITERIA TEST SETUP	53
4.3 ESD TESTING	54
4.3.1 TEST SPECIFICATION	54
4.3.2 TEST PROCEDURE	54
4.3.3 TEST SETUP	55
4.3.4 TEST RESULTS	56
4.3.5 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED	57
4.4 EFT/BURST TESTING	58
4.4.1 TEST SPECIFICATION	58
4.4.2 TEST PROCEDURE	58
4.4.3 TEST SETUP	59
4.4.4 TEST RESULTS	60
4.5 INPUT IMMUNITY TO RF VOLTAGES (DIFFERENTIAL MODE) (S1)	61
4.5.1 TEST LIMIT	61
4.5.2 TEST PROCEDURE	62
4.5.3 TEST SETUP	62
4.5.4 TEST RESULTS	63
4.6 IMMUNITY REQUIREMENTS AT MAINS, LOUDSPEAKER AND HEADPHONE OUTPUT CONNECTOR (S2A)	69
4.6.1 LIMIT	69
4.6.2 TEST PROCEDURE	69
4.6.3 TEST SETUP	69
4.6.4 TEST RESULTS	70
4.7 IMMUNITY TO RF VOLTAGES (COMMON MODE) AT ANTENNA TERMINATE (S2B)	76
4.7.1 TEST LIMIT	76
4.7.2 TEST PROCEDURE	76
4.7.3 TEST SETUP	76
4.7.4 TEST RESULTS	77
4.8 IMMUNITY REQUIREMENTS FOR THE ENCLOSURE PORT (S3)	78
4.8.1 TEST LIMIT	78
4.8.2 TEST PROCEDURE	78
4.8.3 TEST SETUP	79
4.8.4 TEST RESULTS	80
4.9 MEASUREMENT OF SCREENING EFFECTIVENESS (S4)	83
4.9.1 TEST LIMIT	83
4.9.2 TEST PROCEDURE	83
4.9.3 TEST SETUP	84
Radio receiver:	84
Television Receiver:	84

<b>Table of Contents</b>	<b>Page</b>
4.9.4 TEST RESULTS	85
4.10 IMMUNITY TO RF FIELD (KEYED CARRIER) (S5)	86
4.10.1 TEST LIMIT	86
4.10.2 TEST PROCEDURE	86
4.10.3 TEST SETUP	86
4.10.4 TEST RESULTS	87
5 . EUT TEST PHOTO	90
ATTACHMENT PHOTOGRAPHS OF EUT	92

## 1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55013:2013	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	
EN61000-3-2:2006+A2:2009	Harmonic Current Emission	Class A or D NOTE (2)	PASS	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	-----	PASS	
EMC Immunity				
Section EN 55020:2007+A11:2011	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN61000-4-4:2012	Fast transients	B	PASS	
EN 55020:2007+A11:2011	Input immunity to RF voltages (differential mode) (S1)	A	PASS	
EN 55020:2007+A11:2011	Immunity to induced voltage test (in differential mode)(S2a)	A	PASS	
EN 55020:2007+A11:2011	Immunity to RF voltages (common mode) at antenna terminals(S2b)	A	PASS	
EN 55020:2007+A11:2011	Immunity to ambient electromagnetic fields (AM Modulated Carrier)(S3)	A	PASS	
EN 55020:2007+A11:2011	Screening effectiveness of the coaxial antenna terminals(S4)	A	PASS	
EN 55020:2007+A11:2011	Immunity to RF field (Keyed Carrier)(S5)	A	PASS	

### NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) The power consumption of EUT is less than 75W and no Limits apply.
- (3) For client's request and manual description, the test will not be executed.

## 1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd.

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration Number:238937; IC Registration Number:9270A-1

CNAS Registration Number:L5516

## 1.2 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 %.

### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6000GHz	5.0	

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	5.1MULTIMEDIA SPEAKER	
Model Name	F6000U	
Additional Model Number(s)	N/A	
Model Difference	N/A	
Product Description	The EUT is a 5.1MULTIMEDIA SPEAKER.	
	Operating frequency:	32MHz
	Connecting I/O port:	USB
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an AV Device. More details of EUT technical specification, please refer to the User's Manual.	
Power Source	AC Voltage	
Power Rating	220-240~, 50/60Hz, 0.55A	



## 2.2 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	FM
Mode 2	DVD
Mode 3	AUX
Mode 4	SD
Mode 5	USB

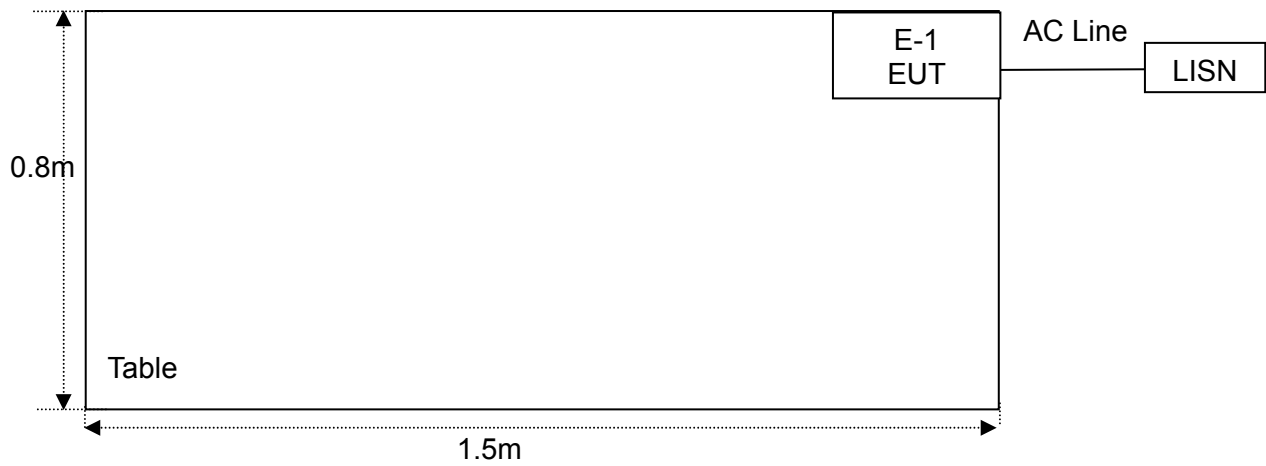
For Conducted Test	
Final Test Mode	Description
Mode 1	FM
Mode 2	DVD
Mode 3	AUX
Mode 4	SD
Mode 5	USB

For Radiated Test	
Final Test Mode	Description
Mode 1	FM

For EMS Test	
Final Test Mode	Description
Mode 3	AUX

## 2.3 DESCRIPTION OF TEST SETUP

Mode CE: AUX



## 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	5.1MULTIMEDIA SPEAKER	F&D	F6000U	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

## 2.5 MEASUREMENT INSTRUMENTS LIST

### 2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Jul. 06, 2013	Jul. 05, 2014	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8129245	Dec. 25, 2013	Dec. 24, 2014	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	Dec. 25, 2013	Dec. 24, 2014	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Test Cable	N/A	C01	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
6	Test Cable	N/A	C02	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
7	Test Cable	N/A	C03	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jul. 06, 2013	Jul. 05, 2014	1 year
11	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2013	Jul. 07, 2014	1 year

### 2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06, 2013	Jul. 05, 2014	1 year
2	Test Cable	N/A	R-01	N/A	Dec. 25, 2013	Dec. 24, 2014	1 year
3	Test Cable	N/A	R-02	N/A	Dec. 25, 2013	Dec. 24, 2014	1 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2013	Jul. 05, 2014	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Amplifier	EM	EM-30180	060538	Jul. 06, 2013	Jul. 05, 2014	1 year

### 2.5.3 HARMONICS AND FLICKER

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Jul. 06, 2013	Jul. 05, 2014	1 year

2	AC Power Source	EM TEST	ACS500	0203-01	Jul. 06, 2013	Jul. 05, 2014	1 year
---	-----------------	---------	--------	---------	---------------	---------------	--------

#### 2.5.4 ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD TEST GENERATOR	SCHAFFNER	NSG438	859	Jul. 06, 2013	Jul. 05, 2014	1 year

#### 2.5.5 EFT/BURST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EFT/B Generator	EVERFINE	EMS61000-4A-V2	1012005	Aug. 04, 2013	Aug. 03, 2014	1 year

#### 2.5.6 S1,S2,S3,S4,S5

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Notebook PC	IBM	M50 Thinkcentre P4	8188M7A KHCN1H5	N/A	N/A	1 year
2	Dsb Data Insertter	Rohde & Schwarz	Dsip020	100031	Mar. 18, 2013	Mar. 17, 2014	1 year
3	Dab Testsender Dab Testtransmitter	Rohde & Schwarz	Sdb601	100038	Mar. 18, 2013	Mar. 17, 2014	1 year
4	Mpeg2 Measurement Generator	Rohde & Schwarz	Dvg	100333	Mar. 18, 2013	Mar. 17, 2014	1 year
5	Tv-Messen der .Tv Test Transmitter	Rohde & Schwarz	Sfq	100528	Mar. 18, 2013	Mar. 17, 2014	1 year
6	Tv-Messen der Tv Test Transmitter	Rohde & Schwarz	Sfm	831272/003	Mar. 18, 2013	Mar. 17, 2014	1 year
7	Tv Generator Secam	Rohde & Schwarz	Sgsf	830704/002	Mar. 18, 2013	Mar. 17, 2014	1 year
8	Tv Generator Pal	Rohde & Schwarz	Sgpf	826231/020	Mar. 18, 2013	Mar. 17, 2014	1 year
9	Tv Generator Ntsc	Rohde & Schwarz	Sgmf	844051/007	Mar. 18, 2013	Mar. 17, 2014	1 year
10	Power Amplifier	Bonn Elektronik	Blwa 0310-1	045826-09	Mar. 18, 2013	Mar. 17, 2014	1 year
11	Signal Generator	Rohde & Schwarz	Sml01	103393	Mar. 18, 2013	Mar. 17, 2014	1 year
12	Signal Generator	Rohde & Schwarz	Smv03	100272	Mar. 18, 2013	Mar. 17, 2014	1 year

13	Power Meter	Rohde & Schwarz	Nrvs	101158	Mar. 18, 2013	Mar. 17, 2014	1 year
14	10v Insertion Unit 50 $\omega$	Rohde & Schwarz	Urv5-Z4	100102	Mar. 18, 2013	Mar. 17, 2014	1 year
15	Audio Analyzer	Rohde & Schwarz	Upl	101157	Mar. 18, 2013	Mar. 17, 2014	1 year
16	Rf System Panel	Rohde & Schwarz	Ts-Rsp	100189	N/A	N/A	1 year
17	Power Amplifier	Bonn Elektronik	Bsa 1515-25	055966-01	Mar. 18, 2013	Mar. 17, 2014	1 year
18	Absorbing Clamp	Lüthi Elektronik-Feinmechanik Ag	Mds21	100206	Mar. 18, 2013	Mar. 17, 2014	1 year
19	Jacky	Rohde & Schwarz	N/A	N/A	N/A	N/A	1 year
20	Isolated Transformer	Poly Electronic Service Co., Pte Ltd Singapore	DW	N/A	N/A	N/A	1 year
21	Isolated Transformer	Poly Electronic Service Co., Pte Ltd Singapore	DW	N/A	N/A	N/A	1 year

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

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

FREQUENCY (MHz)	dBuV	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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.

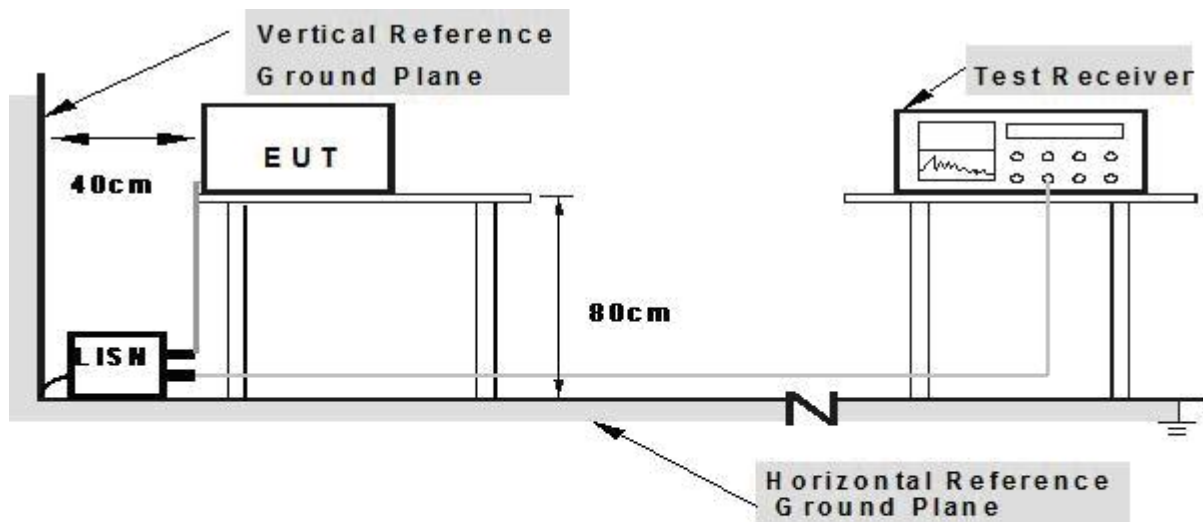
The following table is the setting of the receiver

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

### 3.1.2 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.

### 3.1.3 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**

### 3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



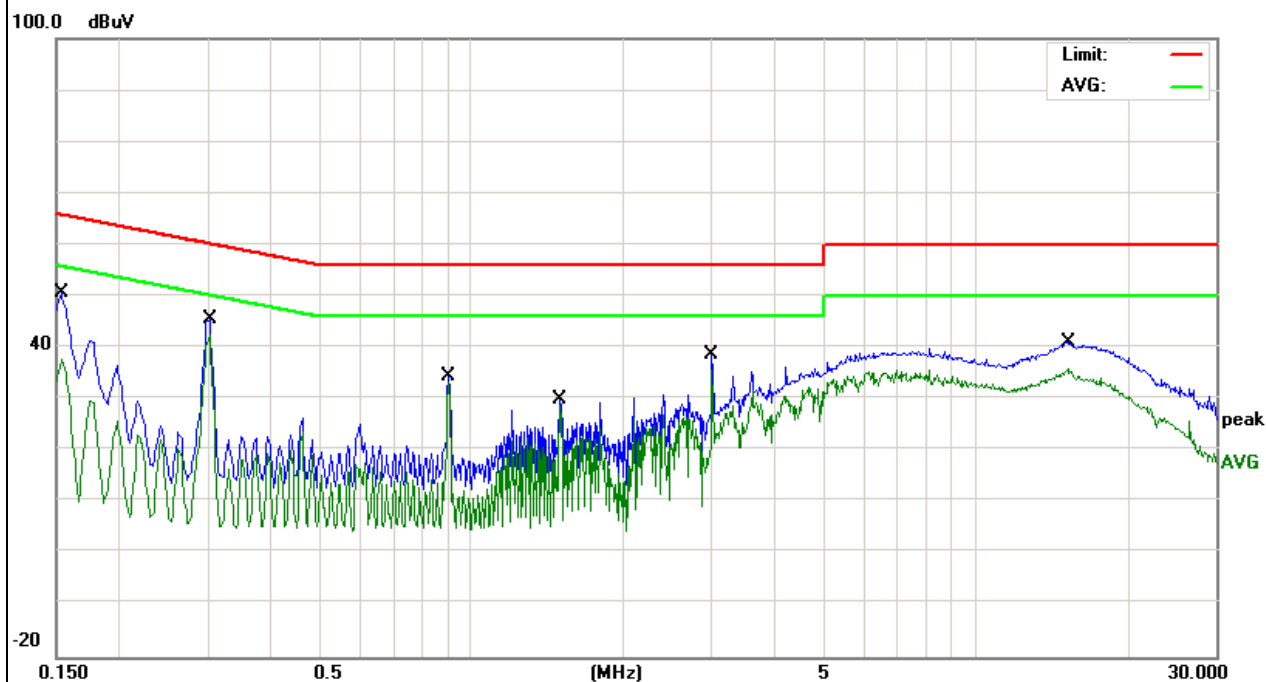
### 3.1.5 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	FM	Phase :	L
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	40.70	9.65	50.35	65.78	-15.43	QP
0.1539	27.63	9.65	37.28	55.78	-18.50	AVG
0.3020	36.10	9.51	45.61	60.19	-14.58	QP
0.3020	32.91	9.51	42.42	50.19	-7.77	AVG
0.9020	24.79	9.55	34.34	56.00	-21.66	QP
0.9020	23.50	9.55	33.05	46.00	-12.95	AVG
3.0020	27.99	9.58	37.57	56.00	-18.43	QP
3.0020	25.84	9.58	35.42	46.00	-10.58	AVG
15.3739	31.15	9.86	41.01	60.00	-18.99	QP
15.3739	25.79	9.86	35.65	50.00	-14.35	AVG
28.6380	25.08	10.23	35.31	60.00	-24.69	QP
28.6380	21.90	10.23	32.13	50.00	-17.87	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

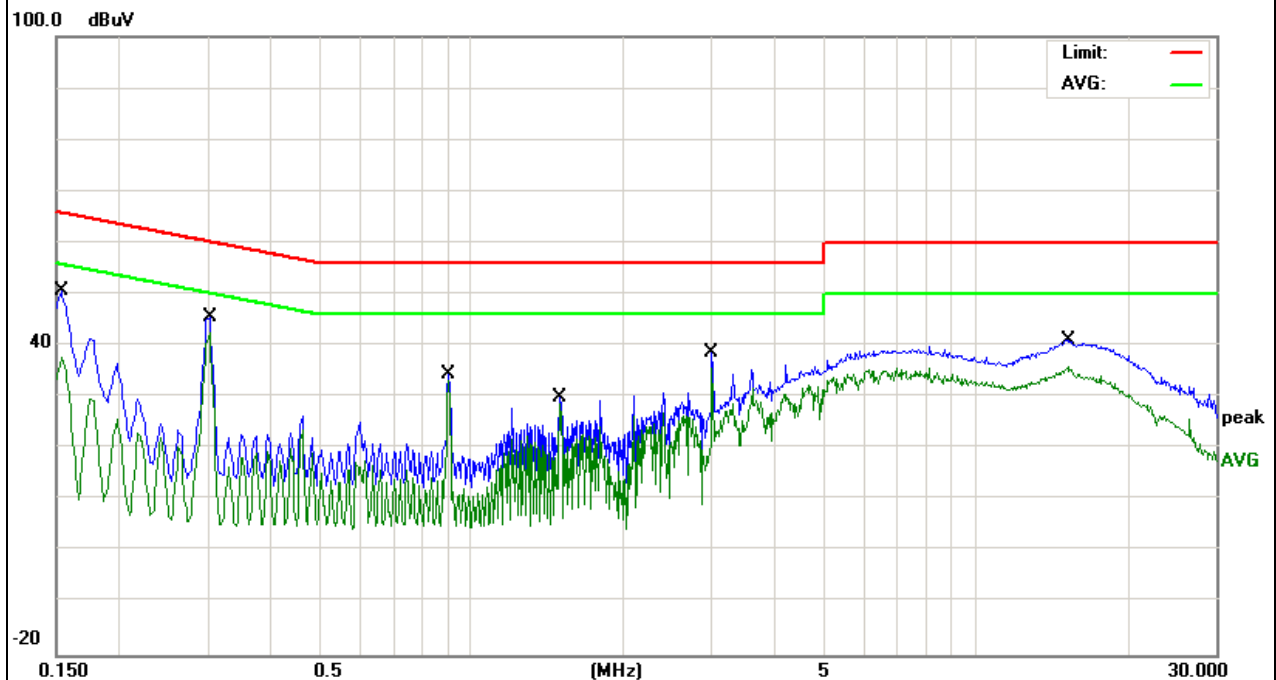


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	FM	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	41.00	9.65	50.65	65.78	-15.13	QP
0.1539	28.17	9.65	37.82	55.78	-17.96	AVG
0.3020	36.11	9.51	45.62	60.19	-14.57	QP
0.3020	32.97	9.51	42.48	50.19	-7.71	AVG
0.9020	24.77	9.55	34.32	56.00	-21.68	QP
0.9020	23.56	9.55	33.11	46.00	-12.89	AVG
1.5020	20.34	9.56	29.90	56.00	-26.10	QP
1.5020	19.08	9.56	28.64	46.00	-17.36	AVG
3.0059	28.96	9.58	38.54	56.00	-17.46	QP
3.0059	26.13	9.58	35.71	46.00	-10.29	AVG
15.3419	31.28	9.86	41.14	60.00	-18.86	QP
15.3419	26.13	9.86	35.99	50.00	-14.01	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

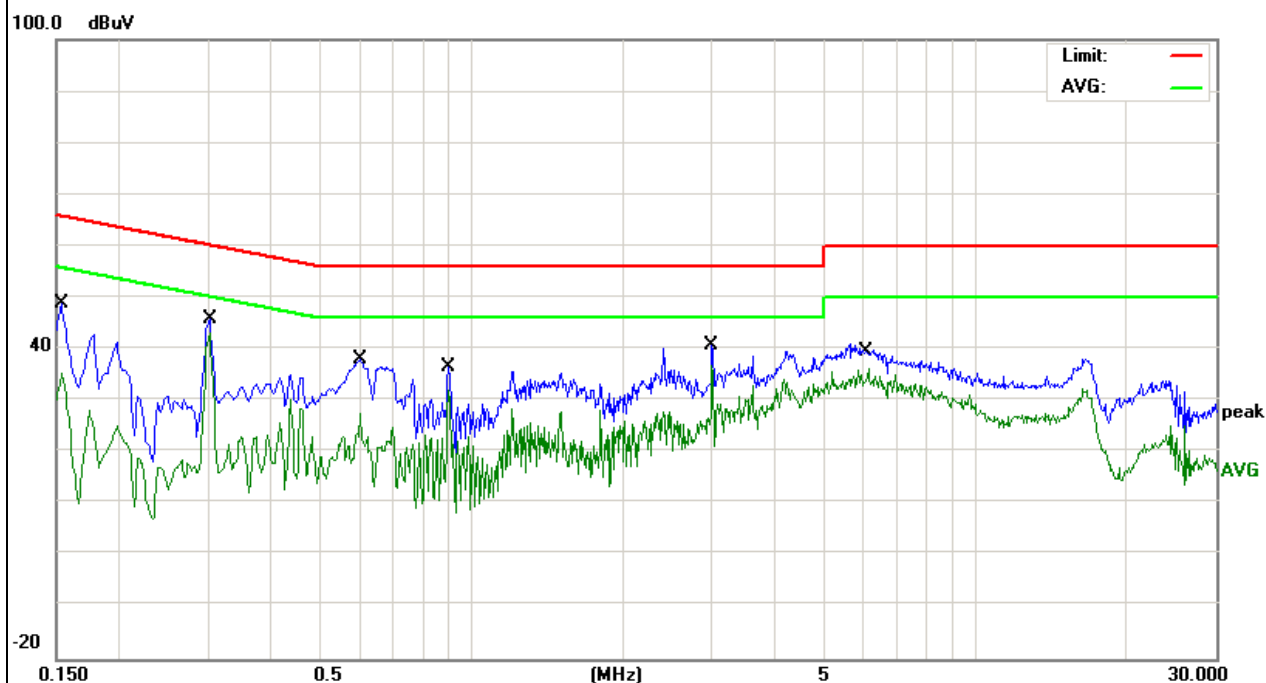


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	DVD	Phase :	L
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	39.33	9.62	48.95	65.78	-16.83	QP
0.1539	25.84	9.62	35.46	55.78	-20.32	AVG
0.3019	36.25	9.50	45.75	60.19	-14.44	QP
0.3019	33.74	9.50	43.24	50.19	-6.95	AVG
0.6019	28.54	9.52	38.06	56.00	-17.94	QP
0.6019	18.09	9.52	27.61	46.00	-18.39	AVG
0.9020	26.94	9.53	36.47	56.00	-19.53	QP
0.9020	22.66	9.53	32.19	46.00	-13.81	AVG
3.0059	31.19	9.57	40.76	56.00	-15.24	QP
3.0059	27.37	9.57	36.94	46.00	-9.06	AVG
6.1299	31.47	9.64	41.11	60.00	-18.89	QP
6.1299	26.49	9.64	36.13	50.00	-13.87	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

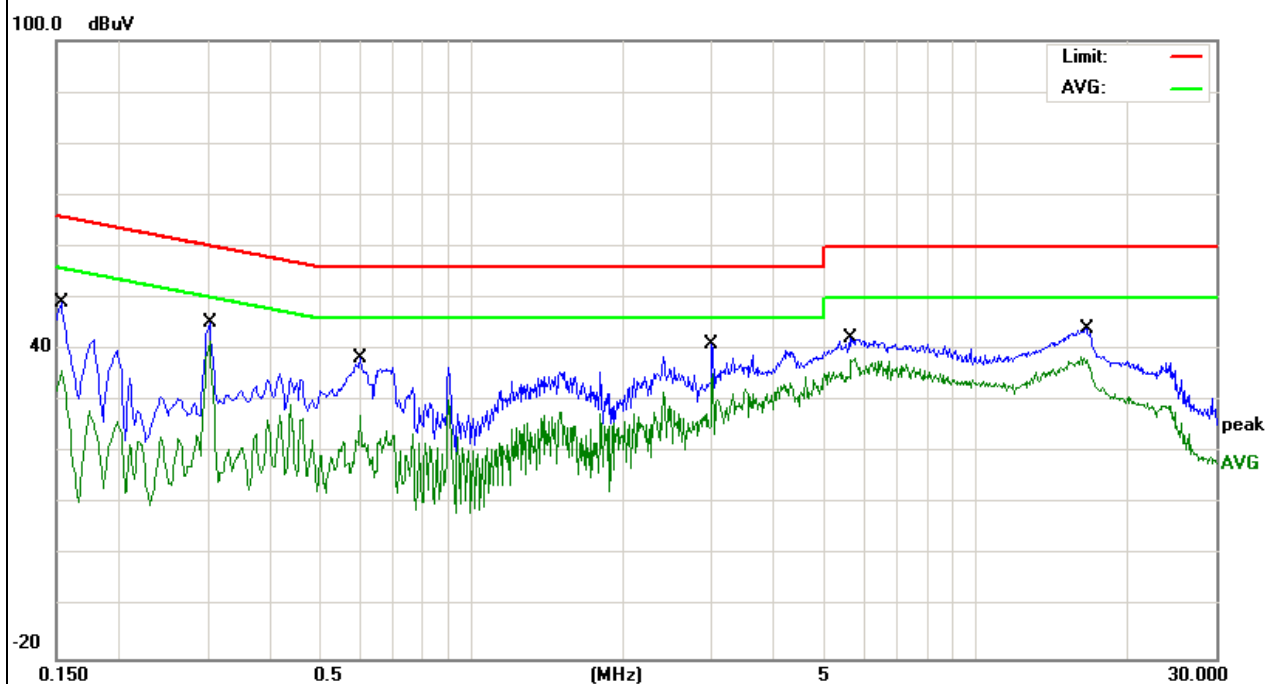


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	DVD	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	39.55	9.65	49.20	65.78	-16.58	QP
0.1539	26.21	9.65	35.86	55.78	-19.92	AVG
0.3019	35.61	9.51	45.12	60.19	-15.07	QP
0.3019	32.08	9.51	41.59	50.19	-8.60	AVG
0.6019	28.71	9.53	38.24	56.00	-17.76	QP
0.6019	17.81	9.53	27.34	46.00	-18.66	AVG
3.0019	31.49	9.58	41.07	56.00	-14.93	QP
3.0019	25.67	9.58	35.25	46.00	-10.75	AVG
5.6258	32.57	9.63	42.20	60.00	-17.80	QP
5.6258	28.84	9.63	38.47	50.00	-11.53	AVG
16.6298	34.23	9.95	44.18	60.00	-15.82	QP
16.6298	28.56	9.95	38.51	50.00	-11.49	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

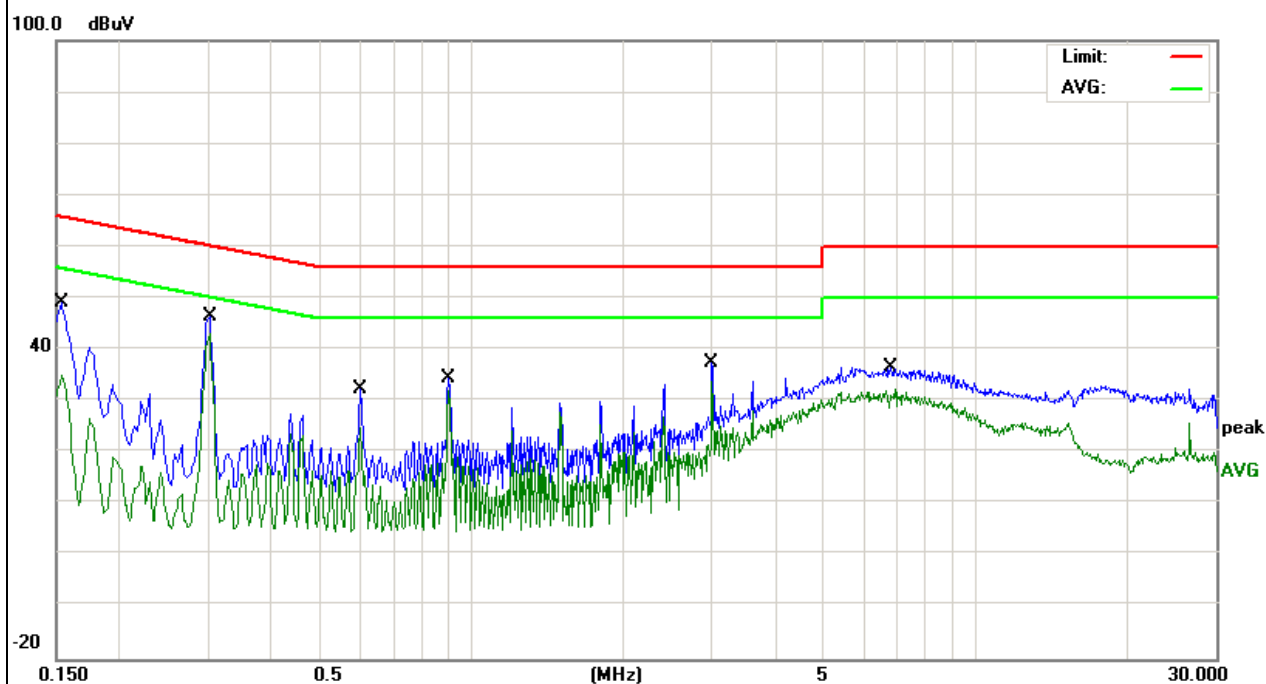


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	AUX	Phase :	L
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	39.64	9.62	49.26	65.78	-16.52	QP
0.1539	25.48	9.62	35.10	55.78	-20.68	AVG
0.3020	36.91	9.50	46.41	60.19	-13.78	QP
0.3020	33.73	9.50	43.23	50.19	-6.96	AVG
0.6020	22.87	9.52	32.39	56.00	-23.61	QP
0.6020	15.31	9.52	24.83	46.00	-21.17	AVG
0.9020	25.03	9.53	34.56	56.00	-21.44	QP
0.9020	22.64	9.53	32.17	46.00	-13.83	AVG
3.0059	28.03	9.57	37.60	56.00	-18.40	QP
3.0059	24.40	9.57	33.97	46.00	-12.03	AVG
6.7939	26.92	9.67	36.59	60.00	-23.41	QP
6.7939	22.57	9.67	32.24	50.00	-17.76	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

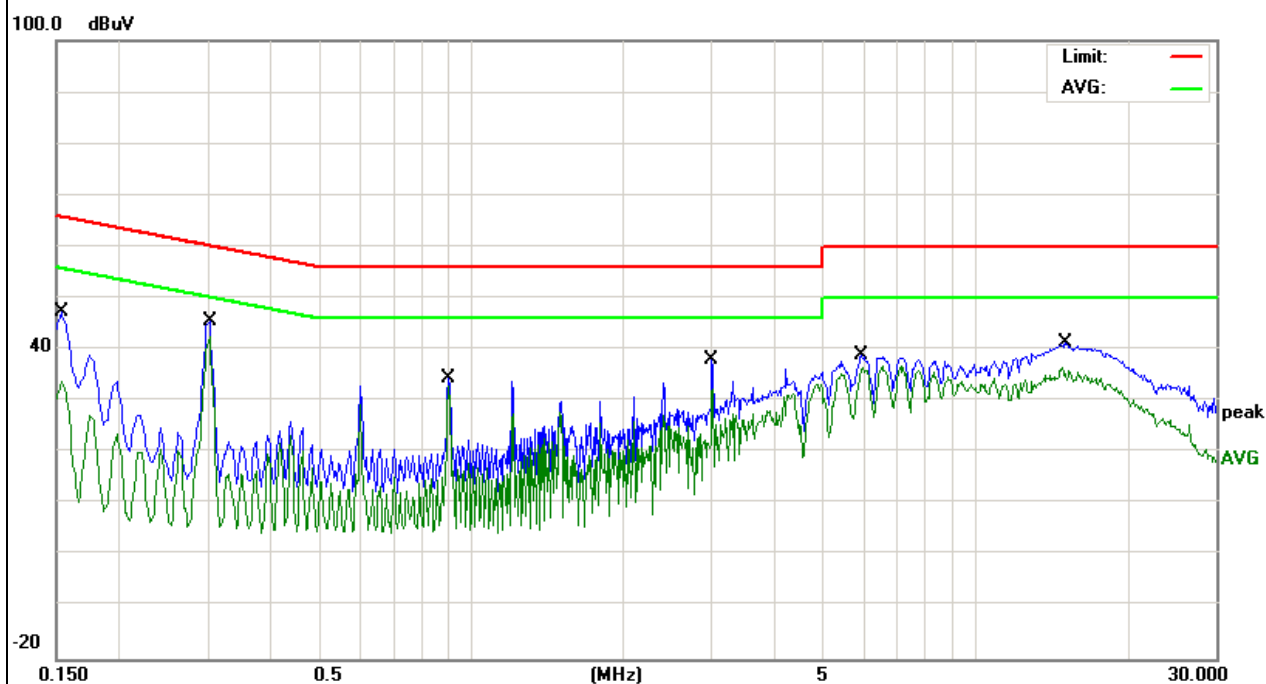


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	AUX	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	37.60	9.65	47.25	65.78	-18.53	QP
0.1539	24.30	9.65	33.95	55.78	-21.83	AVG
0.3020	36.15	9.51	45.66	60.19	-14.53	QP
0.3020	33.05	9.51	42.56	50.19	-7.63	AVG
0.9020	24.93	9.55	34.48	56.00	-21.52	QP
0.9020	23.48	9.55	33.03	46.00	-12.97	AVG
3.0100	28.34	9.58	37.92	56.00	-18.08	QP
3.0100	22.82	9.58	32.40	46.00	-13.60	AVG
5.9379	29.27	9.63	38.90	60.00	-21.10	QP
5.9379	26.80	9.63	36.43	50.00	-13.57	AVG
15.1419	31.39	9.85	41.24	60.00	-18.76	QP
15.1419	26.78	9.85	36.63	50.00	-13.37	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

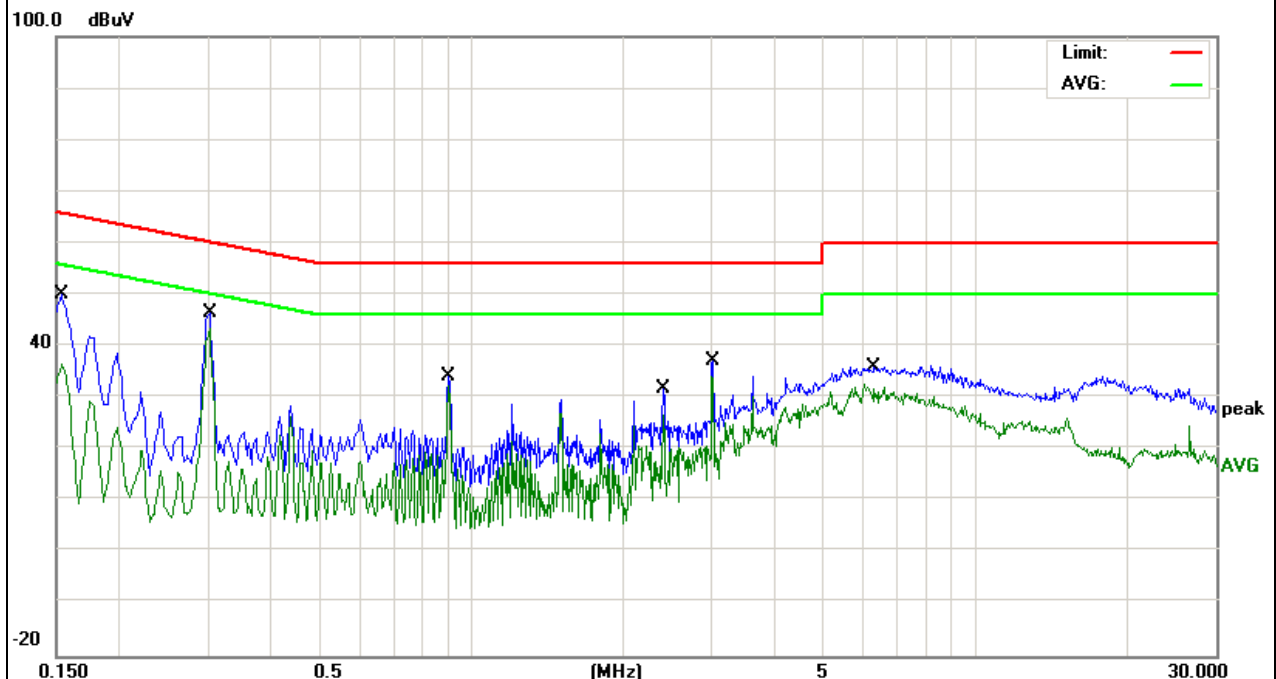


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	SD	Phase :	L
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	40.40	9.62	50.02	65.78	-15.76	QP
0.1539	26.94	9.62	36.56	55.78	-19.22	AVG
0.3020	36.99	9.50	46.49	60.19	-13.70	QP
0.3020	33.90	9.50	43.40	50.19	-6.79	AVG
0.9020	24.74	9.53	34.27	56.00	-21.73	QP
0.9020	22.85	9.53	32.38	46.00	-13.62	AVG
2.4060	22.21	9.56	31.77	56.00	-24.23	QP
2.4060	17.00	9.56	26.56	46.00	-19.44	AVG
3.0100	27.54	9.57	37.11	56.00	-18.89	QP
3.0100	24.58	9.57	34.15	46.00	-11.85	AVG
6.3059	26.32	9.65	35.97	60.00	-24.03	QP
6.3059	22.94	9.65	32.59	50.00	-17.41	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

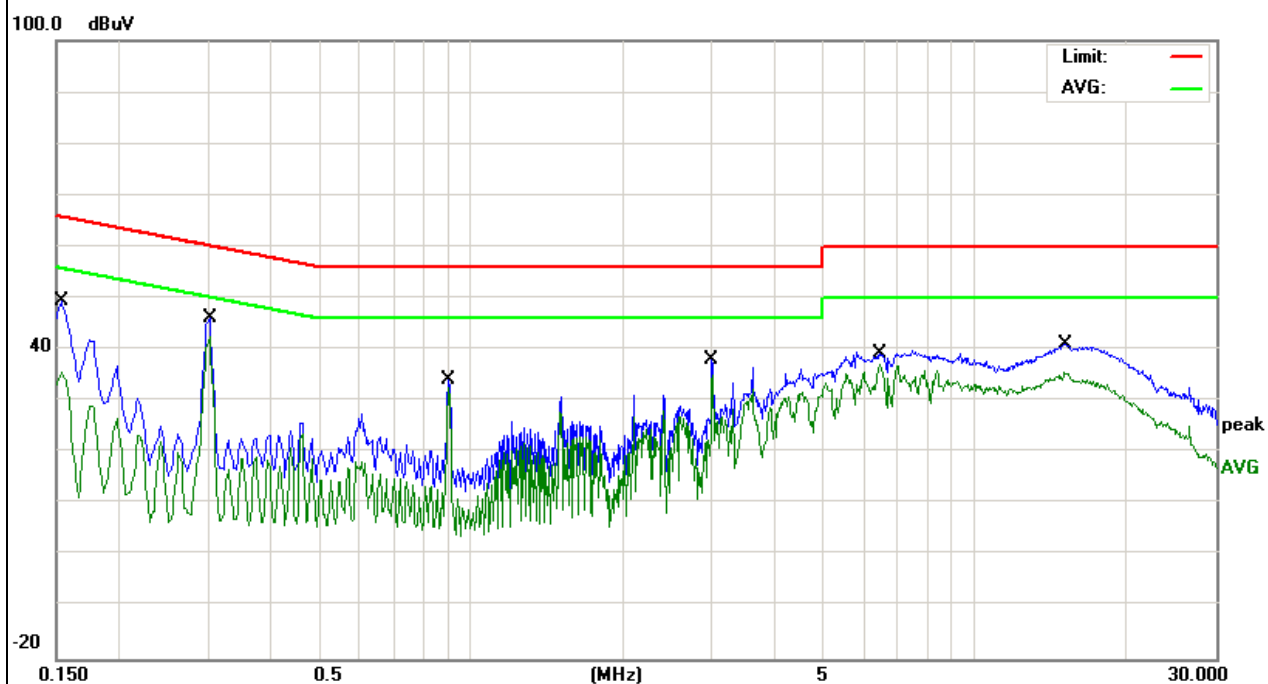


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	SD	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	39.78	9.65	49.43	65.78	-16.35	QP
0.1539	26.00	9.65	35.65	55.78	-20.13	AVG
0.3020	36.53	9.51	46.04	60.19	-14.15	QP
0.3020	33.13	9.51	42.64	50.19	-7.55	AVG
0.9020	24.51	9.55	34.06	56.00	-21.94	QP
0.9020	23.19	9.55	32.74	46.00	-13.26	AVG
3.0100	28.38	9.58	37.96	56.00	-18.04	QP
3.0100	25.59	9.58	35.17	46.00	-10.83	AVG
6.4618	29.58	9.65	39.23	60.00	-20.77	QP
6.4618	27.43	9.65	37.08	50.00	-12.92	AVG
15.1339	31.29	9.85	41.14	60.00	-18.86	QP
15.1339	25.94	9.85	35.79	50.00	-14.21	AVG

Remark:

Factor = Insertion Loss + Cable Loss.



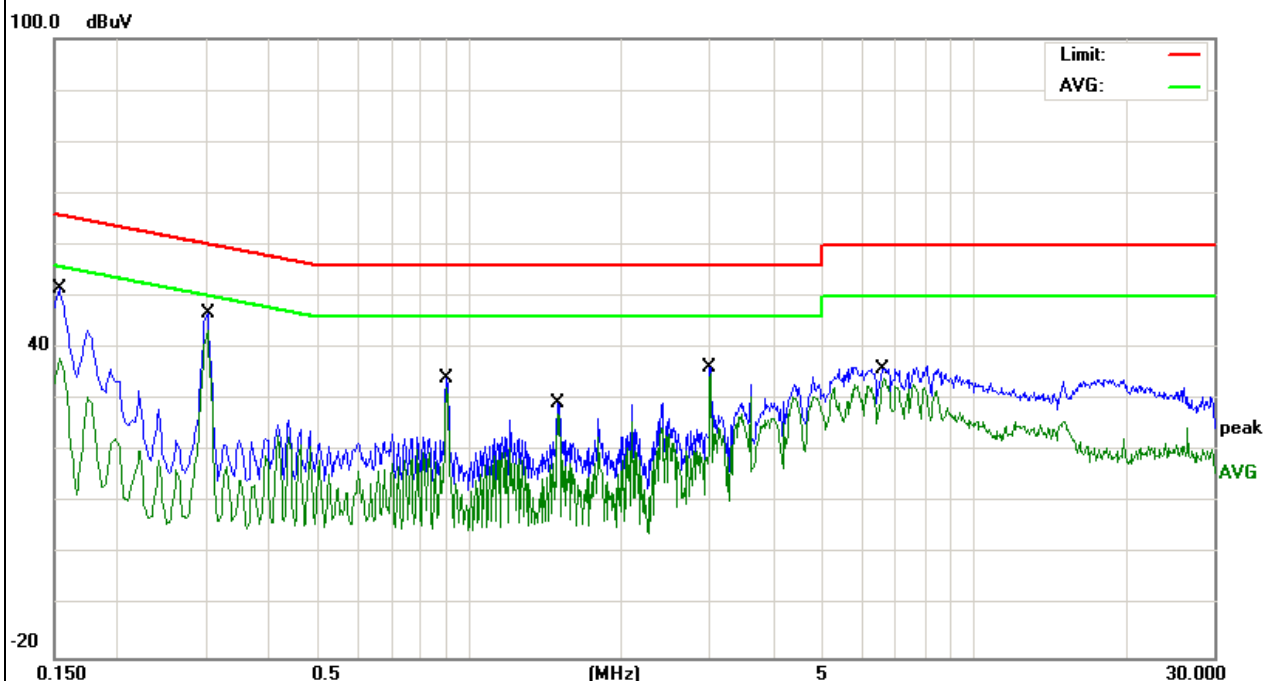


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	USB	Phase :	L
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	41.99	9.62	51.61	65.78	-14.17	QP
0.1539	28.56	9.62	38.18	55.78	-17.60	AVG
0.3019	37.15	9.50	46.65	60.19	-13.54	QP
0.3019	33.86	9.50	43.36	50.19	-6.83	AVG
0.9020	24.61	9.53	34.14	56.00	-21.86	QP
0.9020	22.84	9.53	32.37	46.00	-13.63	AVG
1.5020	19.87	9.54	29.41	56.00	-26.59	QP
1.5020	17.81	9.54	27.35	46.00	-18.65	AVG
3.0059	26.79	9.57	36.36	56.00	-19.64	QP
3.0099	25.34	9.57	34.91	46.00	-11.09	AVG
6.5938	26.42	9.66	36.08	60.00	-23.92	QP
6.5938	24.61	9.66	34.27	50.00	-15.73	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

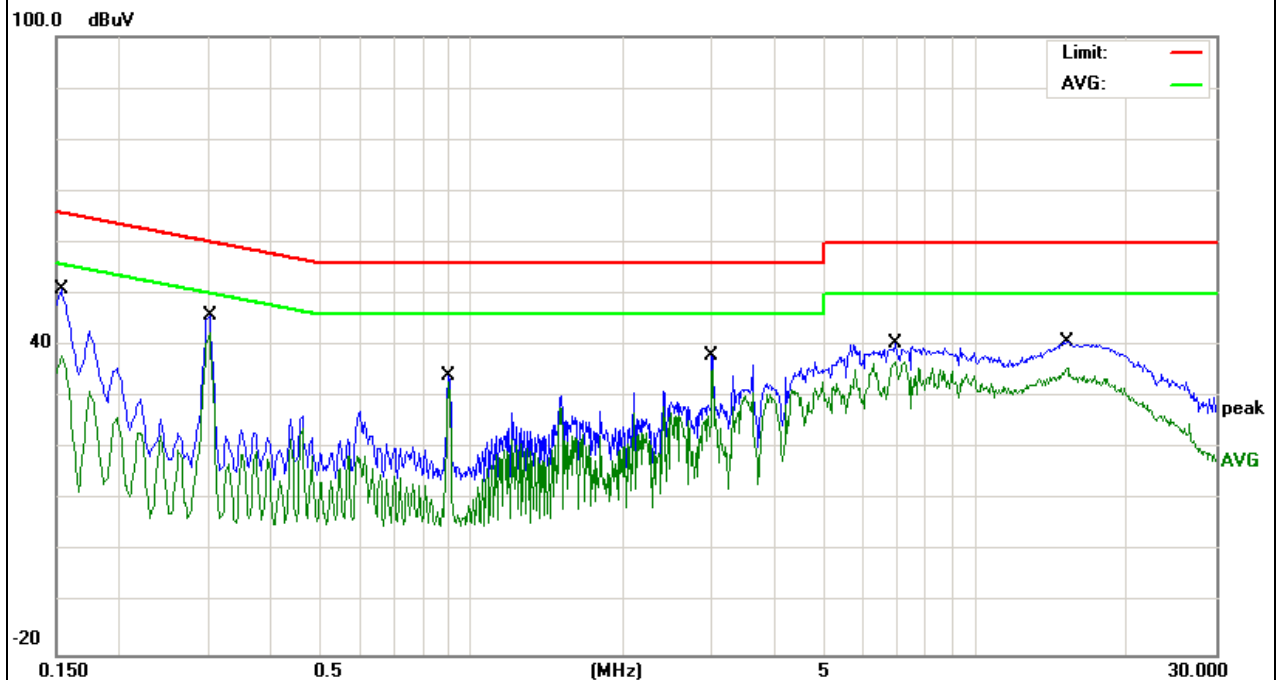


EUT :	5.1MULTIMEDIA SPEAKER	Model Name. :	F6000U
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-03-11
Test Mode :	USB	Phase :	N
Test Voltage :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.1539	41.17	9.65	50.82	65.78	-14.96	QP
0.1539	28.52	9.65	38.17	55.78	-17.61	AVG
0.3020	36.37	9.51	45.88	60.19	-14.31	QP
0.3020	33.09	9.51	42.60	50.19	-7.59	AVG
0.9020	24.55	9.55	34.10	56.00	-21.90	QP
0.9020	23.29	9.55	32.84	46.00	-13.16	AVG
3.0100	28.54	9.58	38.12	56.00	-17.88	QP
3.0100	25.79	9.58	35.37	46.00	-10.63	AVG
6.9219	30.50	9.67	40.17	60.00	-19.83	QP
6.9219	27.12	9.67	36.79	50.00	-13.21	AVG
15.1619	31.02	9.85	40.87	60.00	-19.13	QP
15.1619	25.78	9.85	35.63	50.00	-14.37	AVG

Remark:

Factor = Insertion Loss + Cable Loss.



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 LIMITS OF DISTURBANCE VOLTAGE AT MAINS TERMINALS

FREQUENCY (MHz)	dBuV/m	
	At 10m	At 3m
30 – 230	30	40
230 – 1000	37	47

#### 3.2.2 LIMITS OF DISTURBANCE VOLTAGE AT THE ANTENNA TERMINALS

Equipment type	Source	Frequency MHz	Limit values dBuV 75ohm Quasi-peak note2
Television receivers, video and PC tuner cards working in channels between 30 MHz and 1 GHz	Local oscillator	≤1000 30 to 950 950 to 2150	Fundamental 46 Harmonics 46 Harmonics 54
	Other	30 to 2150	46
Television receivers for broadcast Satellite transmissions and tuner units note1	Local oscillator	950 to 2150 950 to 2150	Fundamental 54 Harmonics 54
	Other	30 to 2150	46
Frequency modulation sound receivers and PC tuner cards	Local oscillator	≤1000 30 to 300 300 to 1000	Fundamental 54 Harmonics 50 Harmonics 52
	Other	30 to 1000	46
Frequency modulation car radios	Local oscillator	≤1000 30 to 300 300 to 1000	Fundamental 66 Harmonics 59 Harmonics 52
	Other	30 to 1000	46
Associated equipment with an RF input, e.g. video tape player, laser disc player	Other	30 to 2150	46
Note1: At frequencies above 1 GHz the peak detector is used.			
Note2: For tuner units, "antenna terminal" means "first intermediate frequency input terminal".			
Note2: The limit values for receivers with nominal impedance other than 75 Ω are calculated according to the following formula: $LZ = L75 + 10 \log (Z/75)$ dB(μV)			
Note2: For AM broadcast receivers for LW, MW and SW no limits apply.			

#### 3.2.3 LIMITS OF DISTURBANCE VOLTAGE AT RF OUTPUT TERMINALS

Equipment type	Source	Frequency MHz	Limit values dB(μV) 75 Ω Quasi-peak Note1:
Equipment with RF video modulator (e.g. video recorders, camcorders and decoders)	Wanted signal	30 to 950	Carrier frequencies and sidebands 76
	Other	950 to 2150 30 to 2150	Harmonics 46 Harmonics 54 46
Note1: At frequencies above 1 GHz the peak detector is used.			

#### 3.2.4 LIMITS OF DISTURBANCE POWER

Equipment type	Frequency MHz	Limit values Equipment type dB(pW)	
		Quasi	peak Average
Associated equipment (video recorders excluded)	30 to 300	45 to 55 <small>note1</small>	35 to 45 <small>note 1</small>
Note1: Increasing linearly with the frequency.			

Notes:

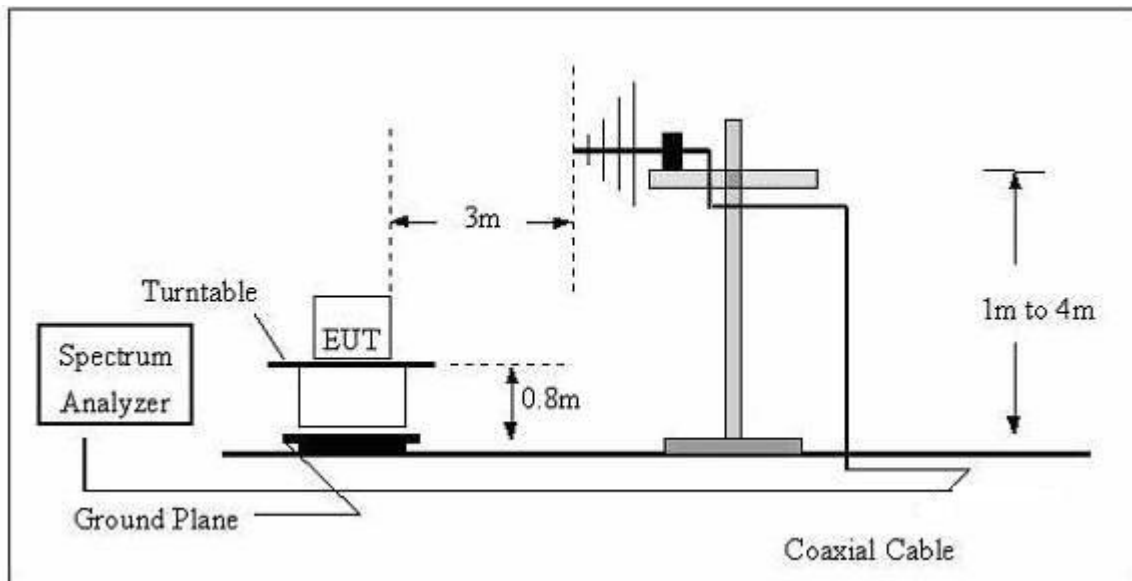
- (1) The limit for radiated test was performed according to as following:  
CISPR 13.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### 3.2.5 TEST PROCEDURE

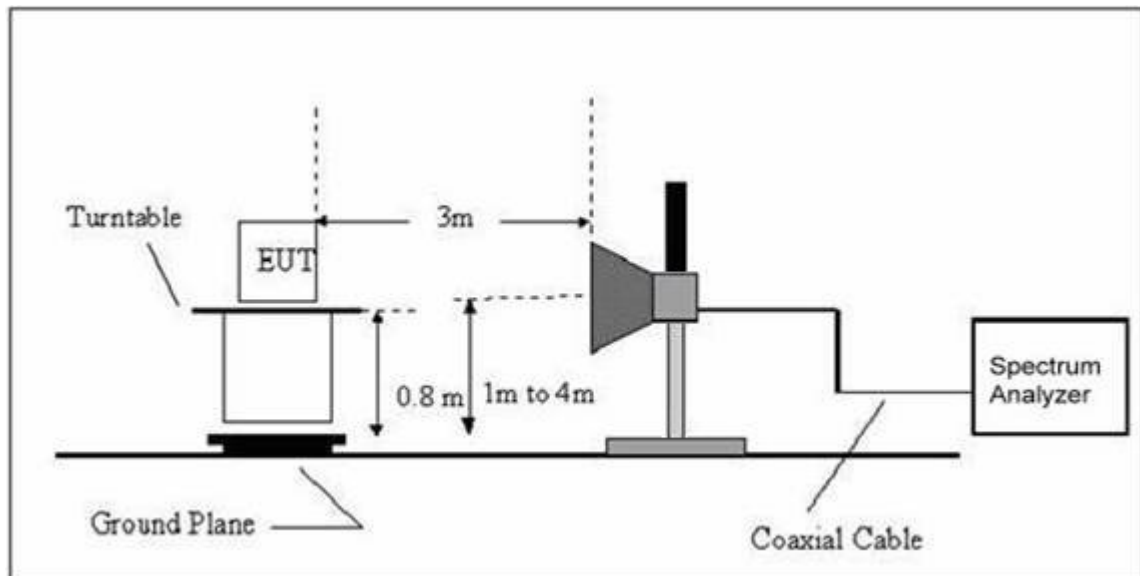
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 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, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.2.6 TEST SETUP

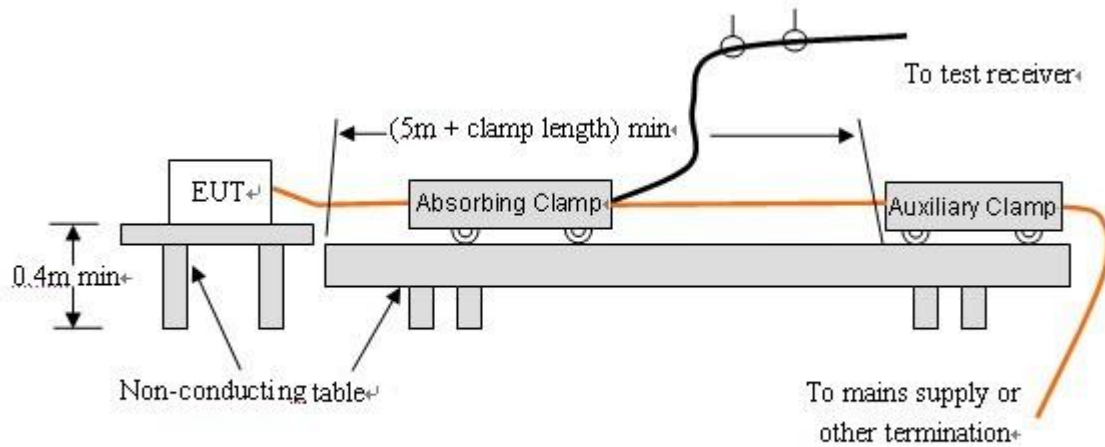
#### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) Disturbance Power Test Set-UP Frequency Below 1GHz



3.2.7 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

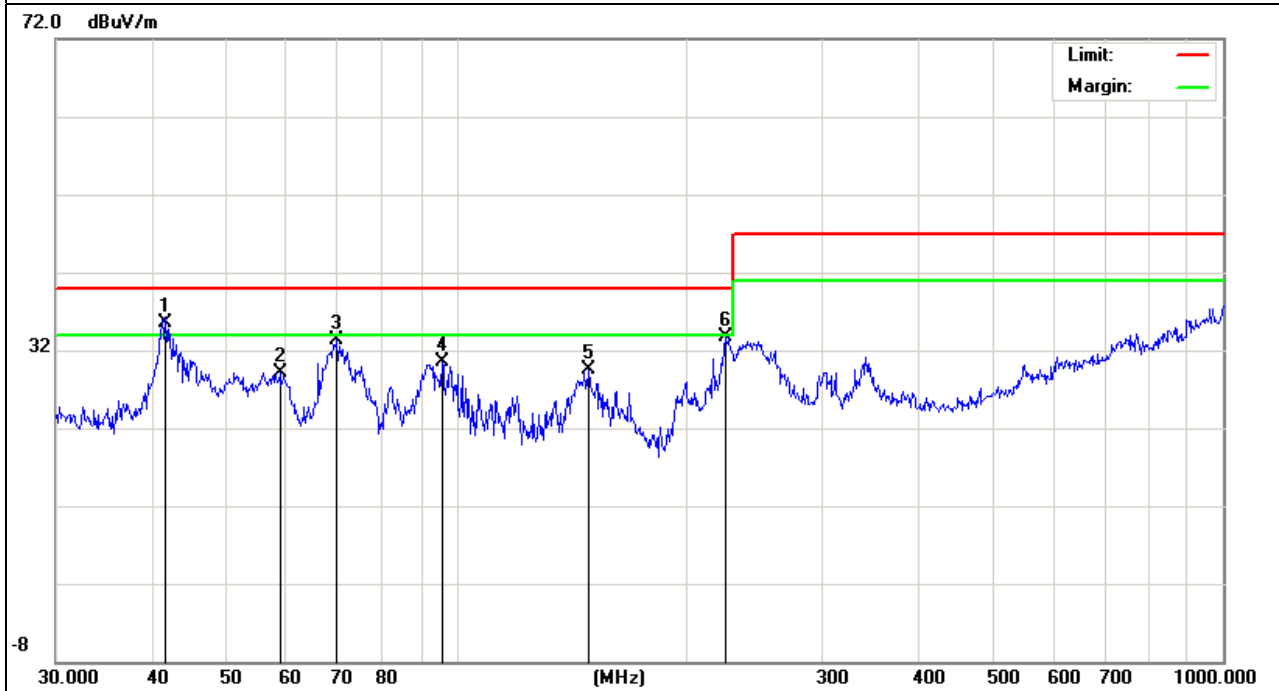
### 3.2.8 TEST RESULTS(30-1000MHz)

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM87.6	Polarization :	Horizontal
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
41.7129	23.14	12.40	35.54	40.00	-4.46	QP
58.8185	23.73	5.47	29.20	40.00	-10.80	QP
69.8450	27.16	6.12	33.28	40.00	-6.72	QP
95.7622	20.27	10.16	30.43	40	-9.57	QP
148.9625	17.70	11.79	29.49	40.00	-10.51	QP
224.5193	22.99	10.70	33.69	40.00	-6.31	QP

Remark:

Factor = Antenna Factor + Cable Loss.

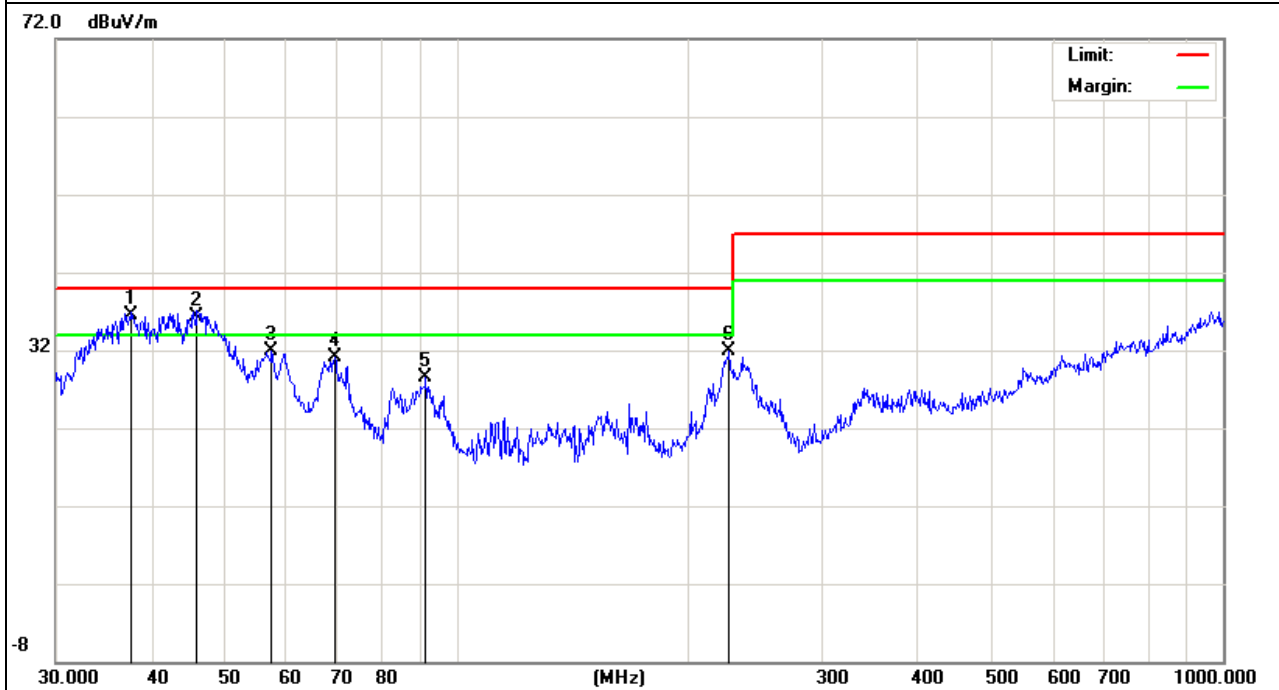


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM 87.6	Polarization :	Vertical
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
37.6798	22.06	14.54	36.60	40.00	-3.40	QP
45.8551	26.25	10.15	36.40	40.00	-3.60	QP
57.3922	26.10	5.71	31.81	40.00	-8.19	QP
69.3568	25	6.02	31.02	40	-8.98	QP
91.1744	18.87	9.63	28.50	40.00	-11.50	QP
226.8934	21.19	10.76	31.95	40.00	-8.05	QP

Remark:

Factor = Antenna Factor + Cable Loss.



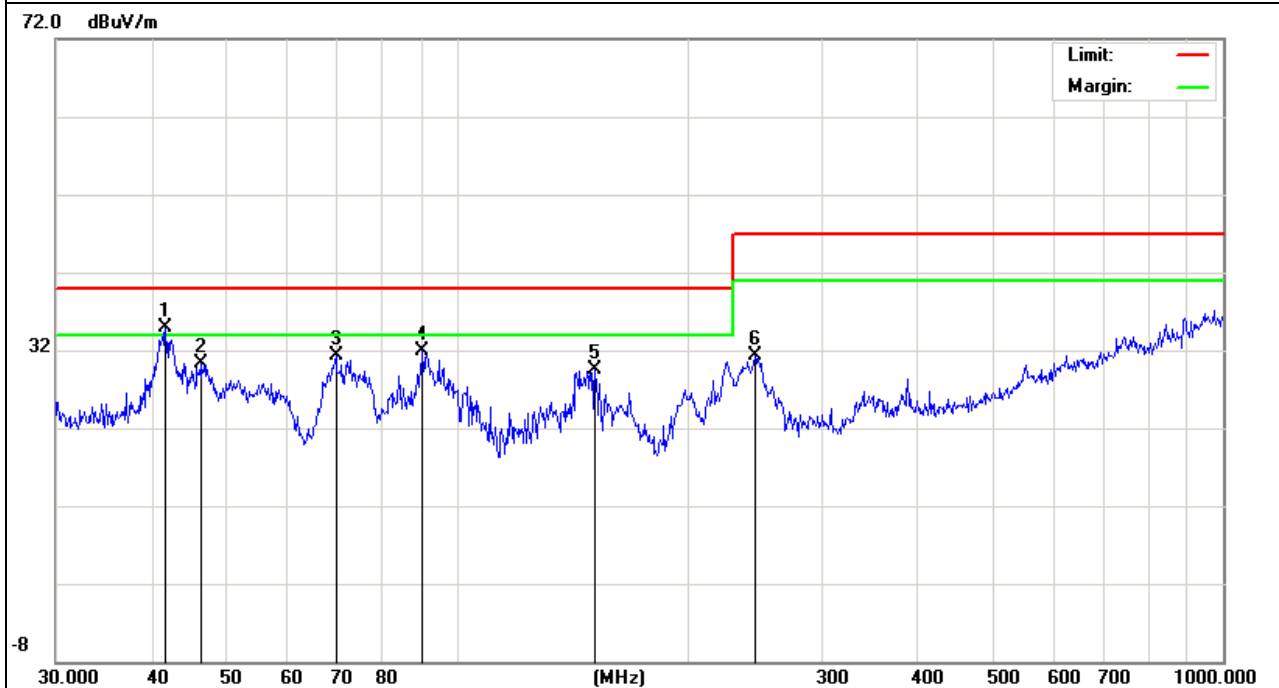


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM 97.8	Polarization :	Horizontal
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
41.7129	22.49	12.40	34.89	40.00	-5.11	QP
46.3402	20.36	9.92	30.28	40.00	-9.72	QP
69.6005	25.16	6.07	31.23	40.00	-8.77	QP
90.2205	22.42	9.47	31.89	40	-8.11	QP
151.5972	17.92	11.65	29.57	40.00	-10.43	QP
245.0900	18.70	12.68	31.38	47.00	-15.62	QP

Remark:

Factor = Antenna Factor + Cable Loss.

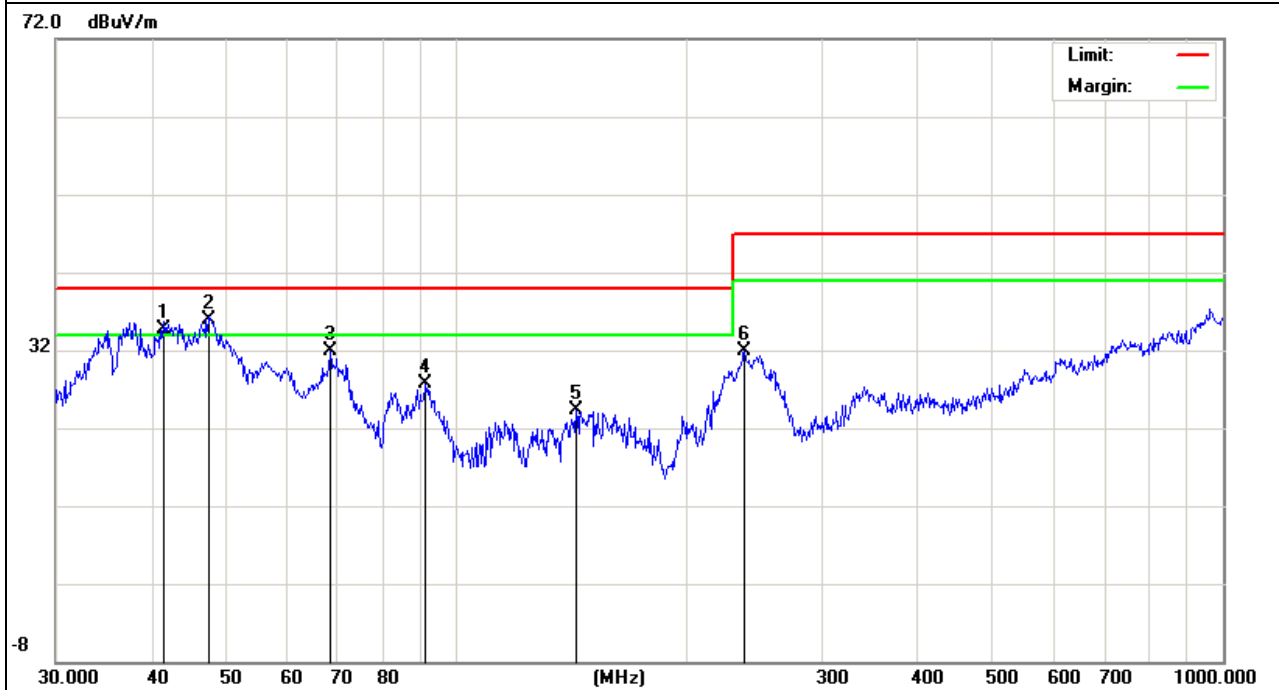


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM 97.8	Polarization :	Vertical
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
41.5670	22.32	12.48	34.80	40.00	-5.20	QP
47.4917	26.46	9.39	35.85	40.00	-4.15	QP
68.3906	26.08	5.82	31.90	40.00	-8.10	QP
91.1744	18.02	9.63	27.65	40	-12.35	QP
143.3257	12.16	12.07	24.23	40.00	-15.77	QP
237.4756	20.53	11.35	31.88	47.00	-15.12	QP

Remark:

Factor = Antenna Factor + Cable Loss.

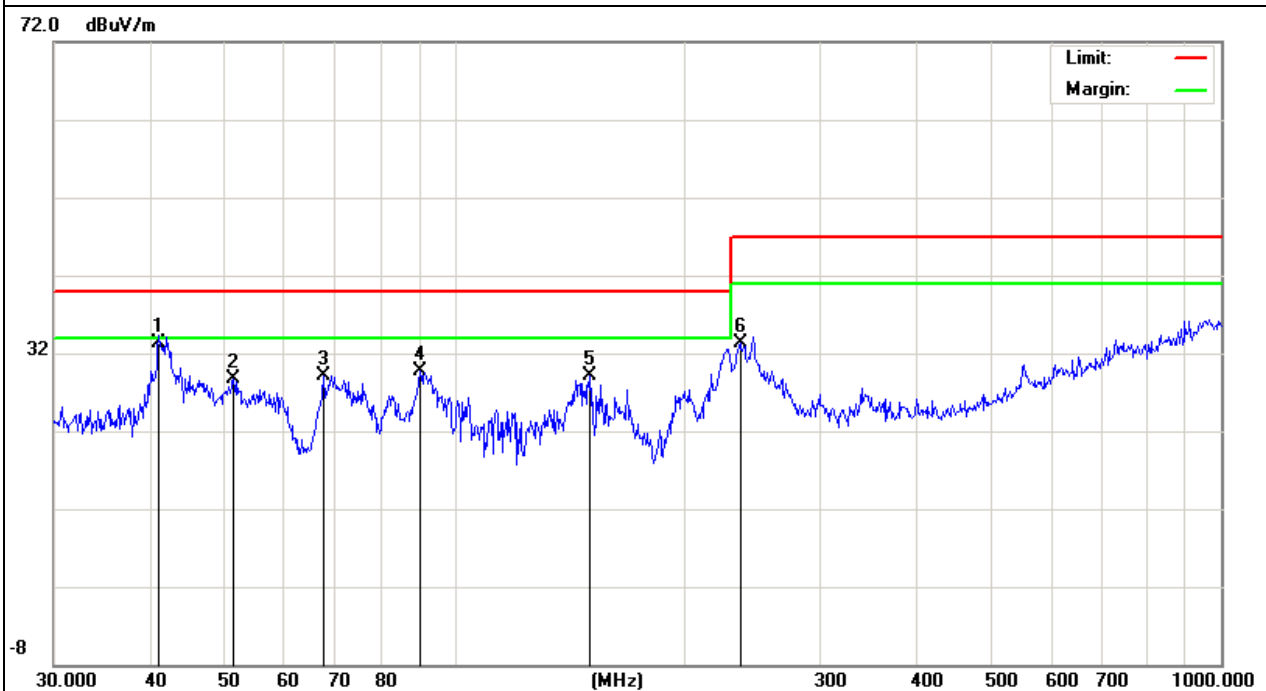


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM 107.9	Polarization :	Horizontal
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
41.1320	20.48	12.73	33.21	40.00	-6.79	QP
51.4806	21.14	7.59	28.73	40.00	-11.27	QP
67.4381	23.49	5.68	29.17	40.00	-10.83	QP
90.2205	20.23	9.47	29.7	40	-10.3	QP
150.0108	17.29	11.73	29.02	40.00	-10.98	QP
235.8164	22.22	11.17	33.39	47.00	-13.61	QP

Remark:

Factor = Antenna Factor + Cable Loss.

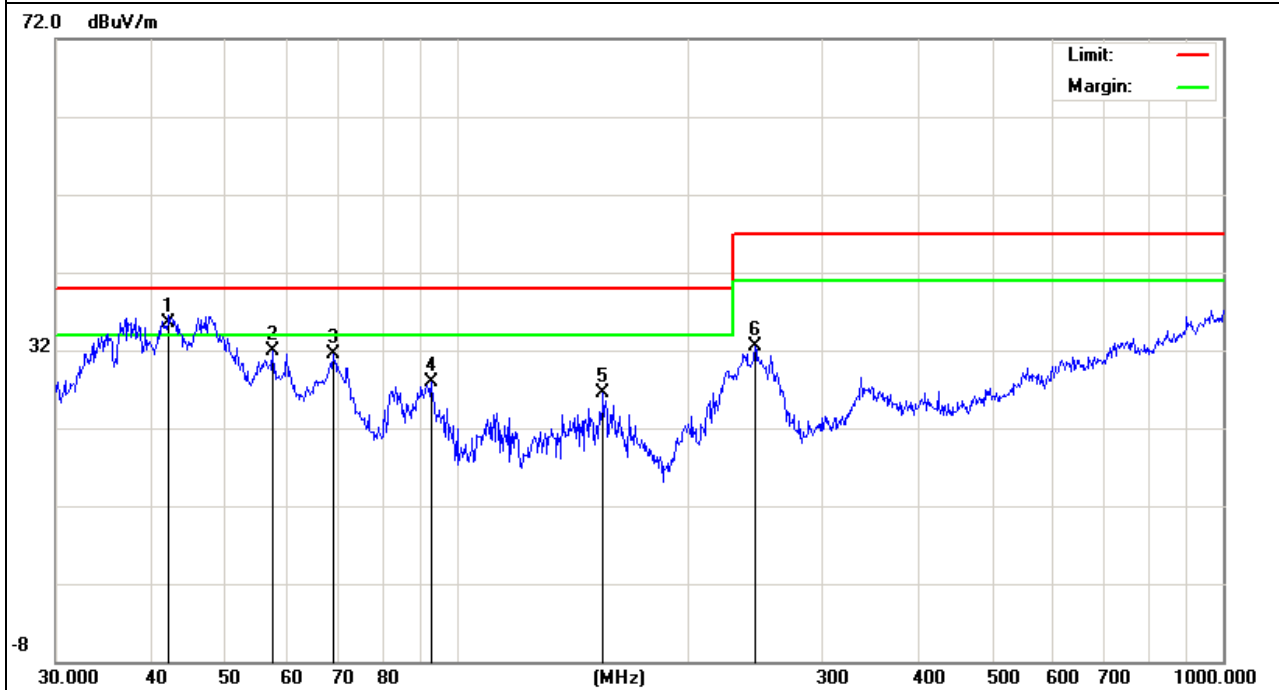


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	FM 107.9	Polarization :	Vertical
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
42.1542	23.27	12.14	35.41	40.00	-4.59	QP
57.5938	26.28	5.67	31.95	40.00	-8.05	QP
69.1140	25.44	5.97	31.41	40.00	-8.59	QP
92.787	18.06	9.88	27.94	40	-12.06	QP
155.3642	15.04	11.43	26.47	40.00	-13.53	QP
245.0900	19.74	12.68	32.42	47.00	-14.58	QP

Remark:

Factor = Antenna Factor + Cable Loss.



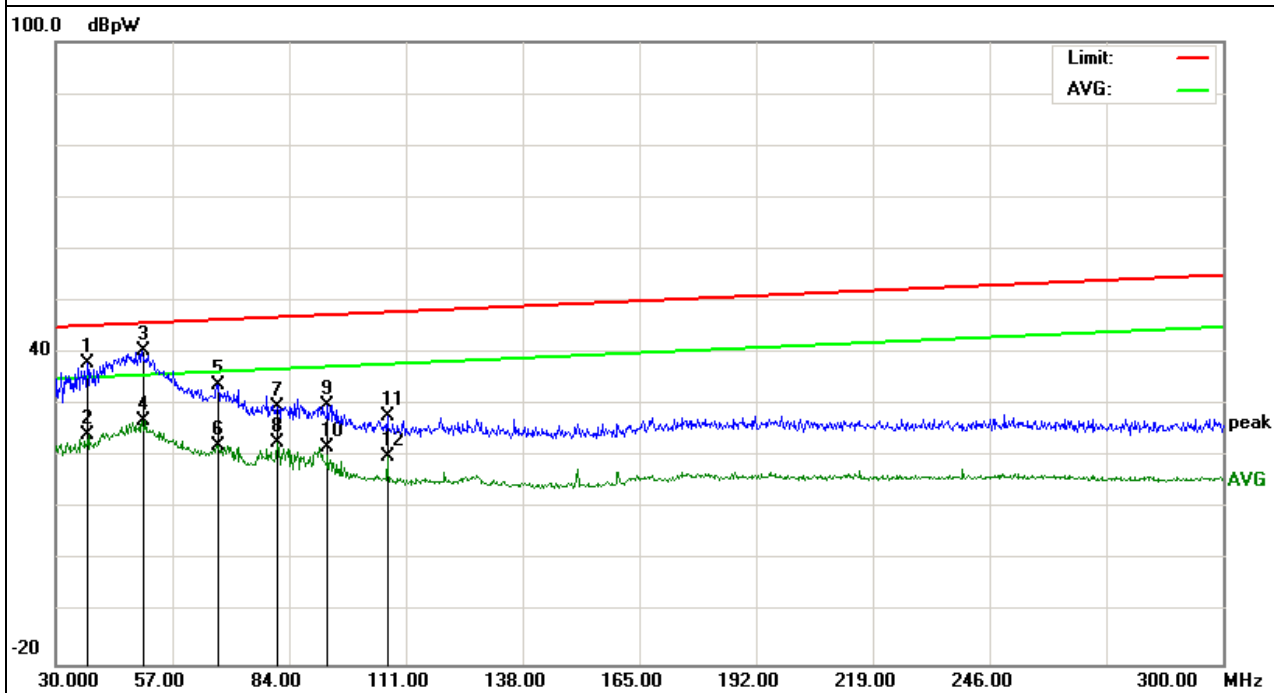
### 3.2.9 TEST RESULTS(30-300MHz)

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AC Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
37.4799	9.73	28.44	38.17	45.28	-7.11	QP
37.4799	-4.32	28.44	24.12	35.28	-11.16	AVG
50.1997	11.93	28.62	40.55	45.75	-5.20	QP
50.1997	-1.74	28.62	26.88	35.75	-8.87	AVG
67.6398	6.35	27.61	33.96	46.39	-12.43	QP
67.6398	-5.46	27.61	22.15	36.39	-14.24	AVG
81.5199	3.10	26.44	29.54	46.91	-17.37	QP
81.5199	-3.73	26.44	22.71	36.91	-14.20	AVG
92.9599	4.24	25.69	29.93	47.33	-17.40	QP
92.9599	-3.88	25.69	21.81	37.33	-15.52	AVG
106.7600	3.03	24.88	27.91	47.84	-19.93	QP
106.7600	-4.73	24.88	20.15	37.84	-17.69	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

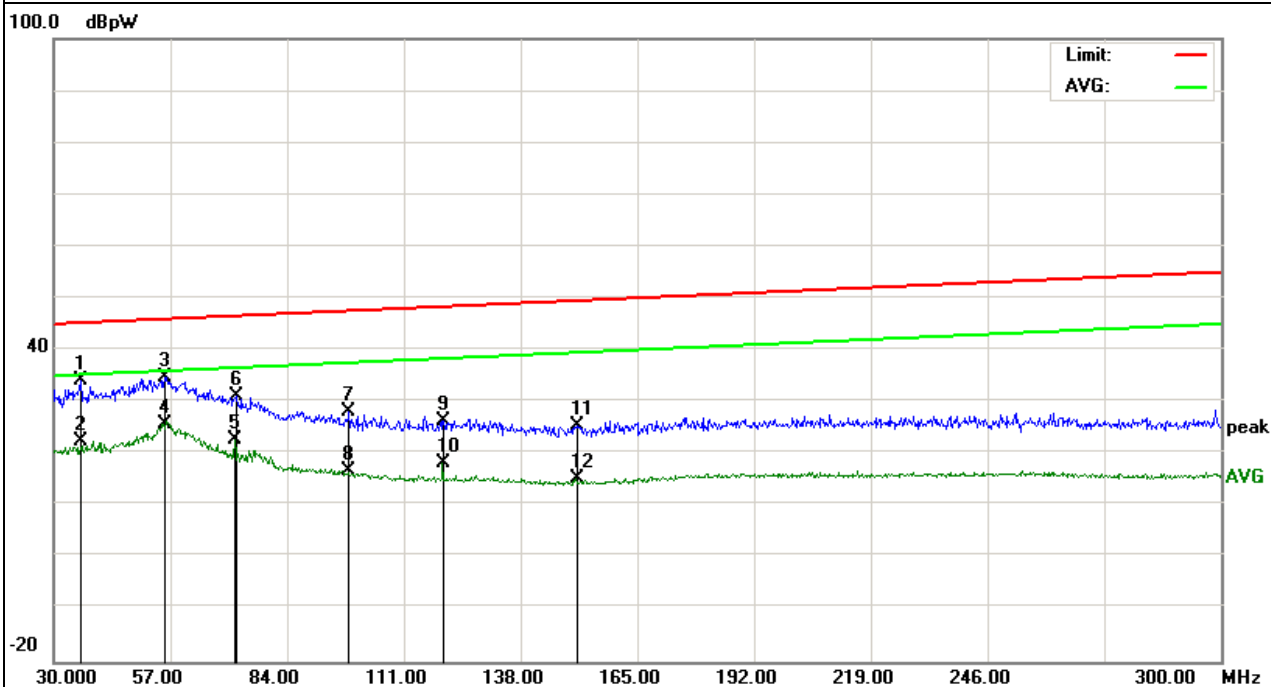


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	Antenna Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
36.2798	5.60	28.42	34.02	45.23	-11.21	QP
36.2798	-6.06	28.42	22.36	35.23	-12.87	AVG
55.7599	6.55	28.25	34.80	45.95	-11.15	QP
55.7599	-2.47	28.25	25.78	35.95	-10.17	AVG
72.0000	-4.61	27.31	22.70	36.56	-13.86	AVG
72.2000	3.76	27.29	31.05	46.56	-15.51	QP
98.5600	2.60	25.42	28.02	47.54	-19.52	QP
98.5600	-8.60	25.42	16.82	37.54	-20.72	AVG
120.3199	1.84	24.65	26.49	48.35	-21.86	QP
120.3199	-6.43	24.65	18.22	38.35	-20.13	AVG
151.2400	1.78	23.65	25.43	49.49	-24.06	QP
151.2400	-8.35	23.65	15.30	39.49	-24.19	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

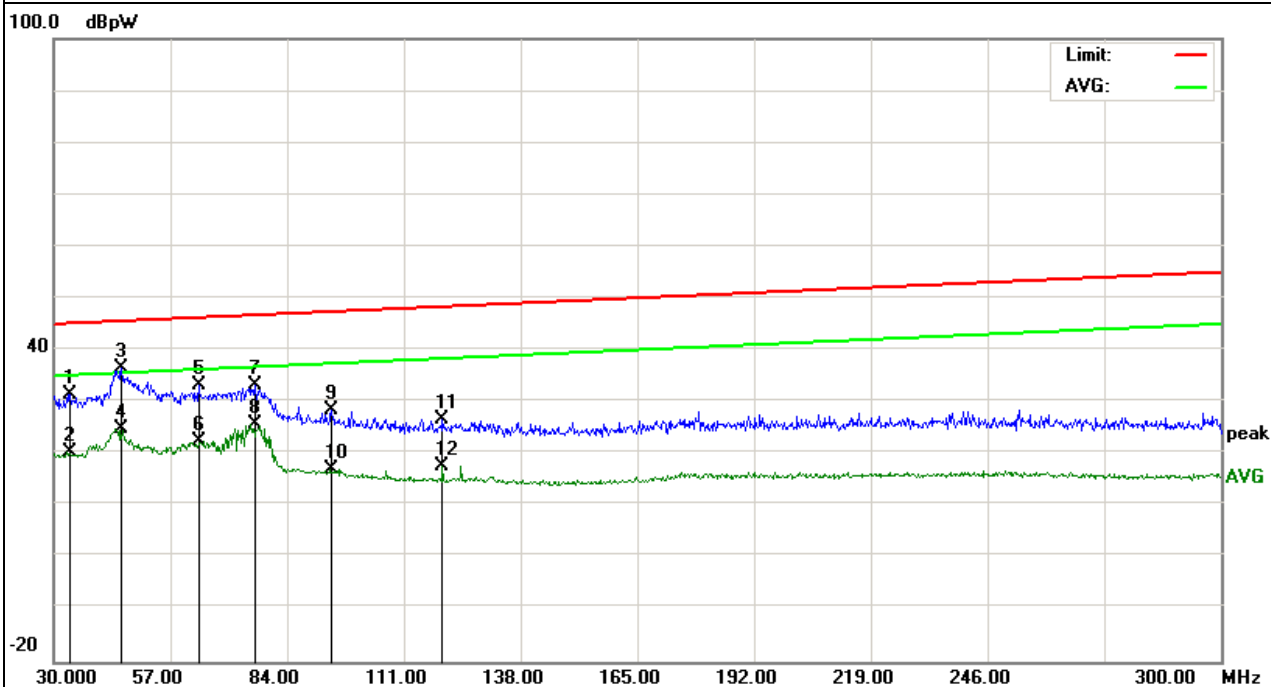


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	HORN Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
33.8798	2.97	28.42	31.39	45.14	-13.75	QP
33.8798	-8.12	28.42	20.30	35.14	-14.84	AVG
45.6799	7.95	28.57	36.52	45.58	-9.06	QP
45.6799	-3.82	28.57	24.75	35.58	-10.83	AVG
63.7199	5.54	27.80	33.34	46.25	-12.91	QP
63.7199	-5.33	27.80	22.47	36.25	-13.78	AVG
76.6800	6.50	26.86	33.36	46.73	-13.37	QP
76.6800	-1.02	26.86	25.84	36.73	-10.89	AVG
94.4000	2.73	25.63	28.36	47.39	-19.03	QP
94.4000	-8.52	25.63	17.11	37.39	-20.28	AVG
120.0400	2.08	24.66	26.74	48.33	-21.59	QP
120.0400	-6.91	24.66	17.75	38.33	-20.58	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

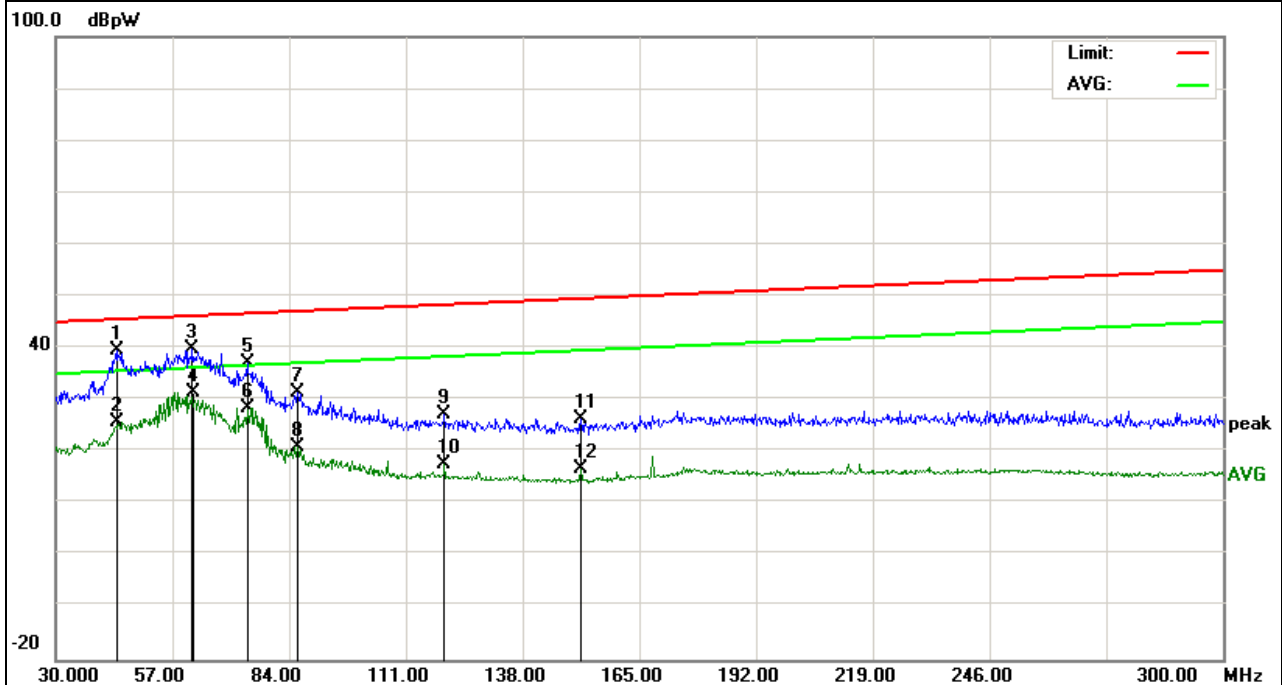


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	DVD Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
44.1199	11.08	28.55	39.63	45.52	-5.89	QP
44.1199	-2.91	28.55	25.64	35.52	-9.88	AVG
61.8399	12.05	27.88	39.93	46.18	-6.25	QP
61.8699	3.53	27.88	31.41	36.18	-4.77	AVG
74.5199	10.15	27.06	37.21	46.65	-9.44	QP
74.5199	1.45	27.06	28.51	36.65	-8.14	AVG
86.0400	5.45	26.12	31.57	47.08	-15.51	QP
86.0400	-5.07	26.12	21.05	37.08	-16.03	AVG
120.0400	2.50	24.66	27.16	48.33	-21.17	QP
120.0400	-7.14	24.66	17.52	38.33	-20.81	AVG
151.6799	2.60	23.66	26.26	49.51	-23.25	QP
151.6799	-6.99	23.66	16.67	39.51	-22.84	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



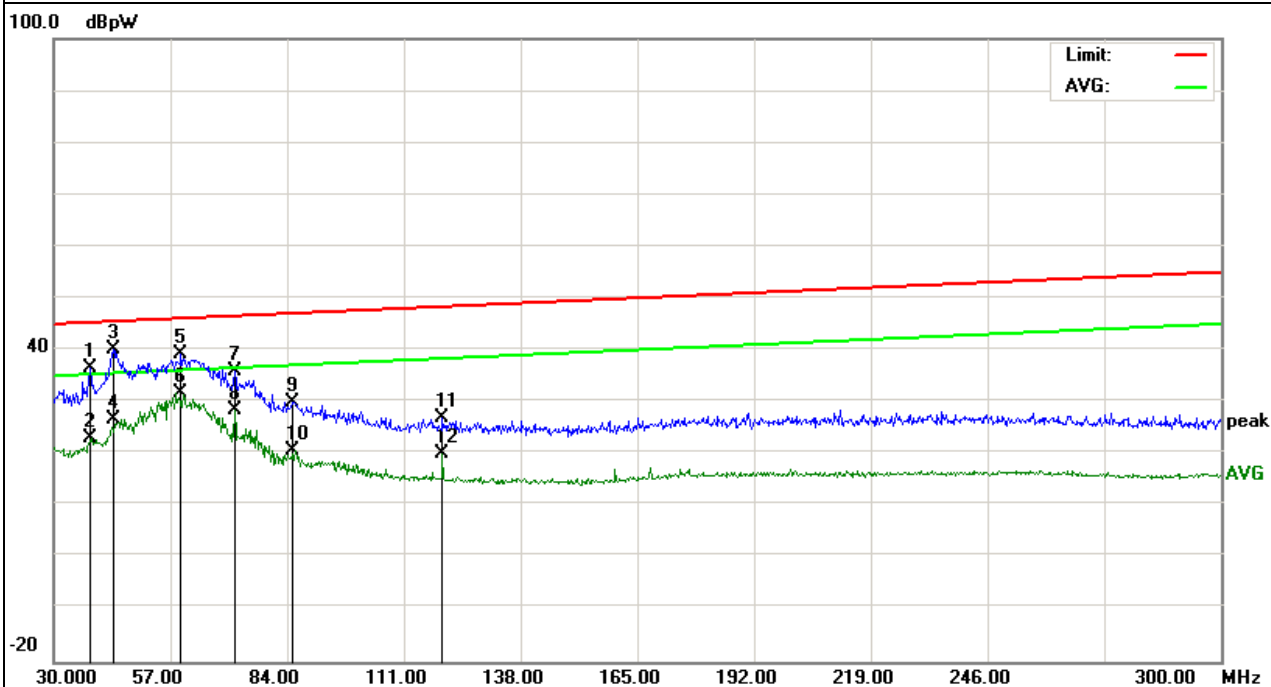


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
38.6398	8.15	28.46	36.61	45.32	-8.71	QP
38.6398	-5.53	28.46	22.93	35.32	-12.39	AVG
43.9998	11.52	28.54	40.06	45.52	-5.46	QP
43.9998	-1.81	28.54	26.73	35.52	-8.79	AVG
59.4799	11.26	28.00	39.26	46.09	-6.83	QP
59.4799	3.79	28.00	31.79	36.09	-4.30	AVG
72.0000	8.73	27.31	36.04	46.56	-10.52	QP
72.0000	1.11	27.31	28.42	36.56	-8.14	AVG
85.4399	3.81	26.15	29.96	47.05	-17.09	QP
85.4399	-5.58	26.15	20.57	37.05	-16.48	AVG
120.0000	2.39	24.66	27.05	48.33	-21.28	QP
120.0000	-4.73	24.66	19.93	38.33	-18.40	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

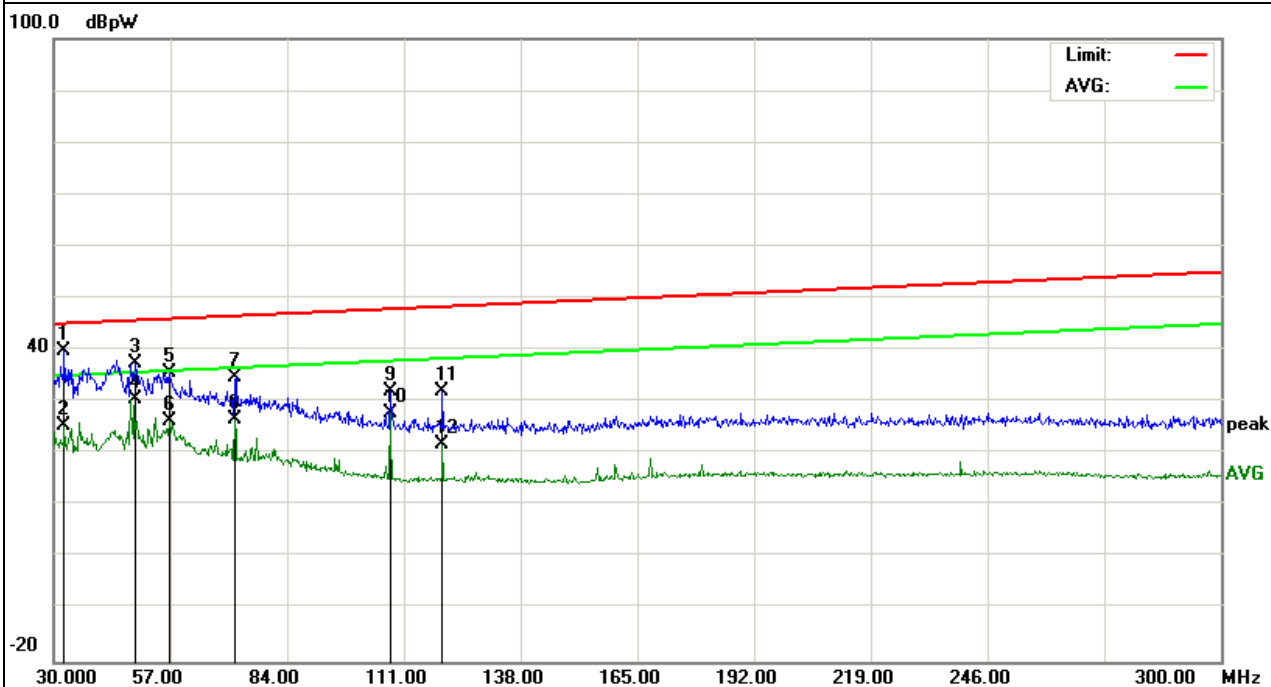


EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	24℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	USB Line		
Test Power :	AC 230V/50Hz		

Freq. (MHz)	Reading (dBpW)	Factor (dBpW)	Measurement (dBpW)	Limit (dBpW)	Over (dB)	Detector
32.5598	11.48	28.45	39.93	45.09	-5.16	QP
32.5598	-2.87	28.45	25.58	35.09	-9.51	AVG
49.1599	8.69	28.63	37.32	45.71	-8.39	QP
49.1599	1.87	28.63	30.50	35.71	-5.21	AVG
56.7999	7.51	28.19	35.70	45.99	-10.29	QP
56.7999	-1.94	28.19	26.25	35.99	-9.74	AVG
72.0000	7.53	27.31	34.84	46.56	-11.72	QP
72.0000	-0.63	27.31	26.68	36.56	-9.88	AVG
108.0000	7.18	24.79	31.97	47.89	-15.92	QP
108.0000	3.03	24.79	27.82	37.89	-10.07	AVG
120.0400	7.46	24.66	32.12	48.33	-16.21	QP
120.0400	-2.69	24.66	21.97	38.33	-16.36	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



### 3.3 HARMONICS CURRENT

#### 3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Amperes)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
8≤n≤40	0.23 · 8/n	DC	0.05		

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Amperes)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A) (mA/w)	
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

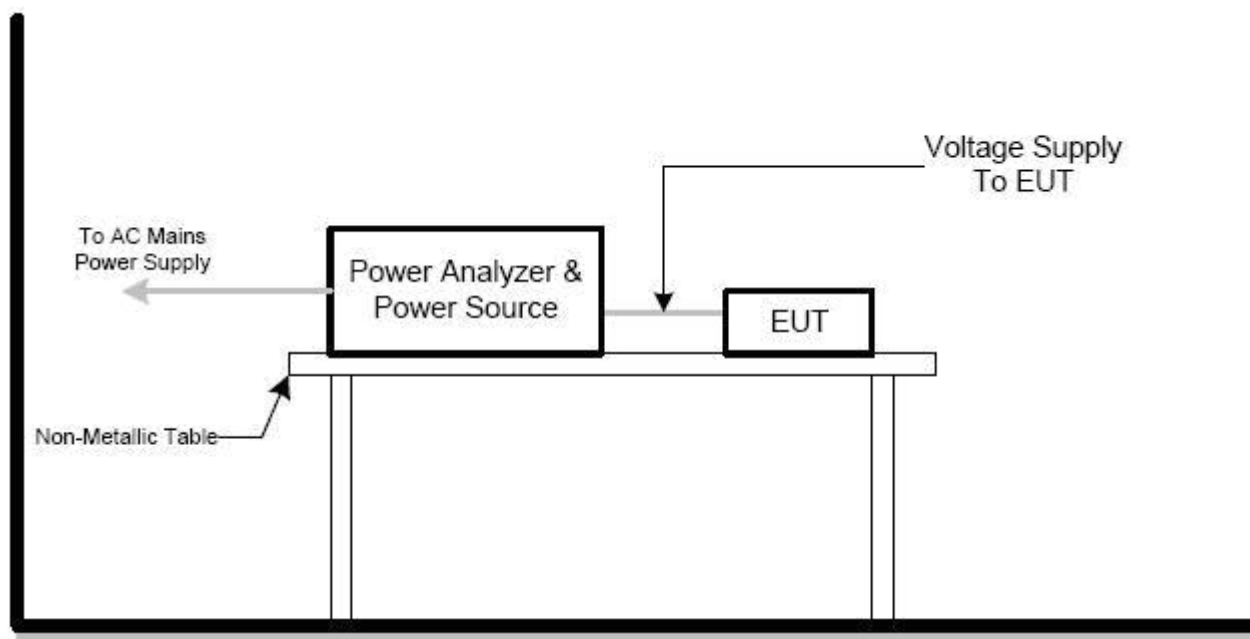
### 3.3.1.1 TEST PROCEDURE

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- b. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:  
 Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.  
 Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.  
 Class C: Lighting equipment.  
 Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.
- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

### 3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.3.1.3 TEST SETUP



### 3.3.2 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

## E. U. T. Result

<b>Harmonic(s) &gt; 200%:</b>
Order (n):                      None
<b>Harmonic(s) with average &gt; 90%:</b>
Order (n):                      None
<b>Harmonic(s) between 150% and 200% during more than 10% of the test time or max. 10min:</b>
Order (n):                      None

## Power Source Result

<b>First dataset out of limit:</b>
DS (time):                      None
<b>Harmonic(s) out of limit:</b>
Order (n):                      None

### Average harmonic current results

Hn	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [A]	Result
1	96.936E-3	100.000		
2	12.197E-3	12.583	972.00E-3	PASS
3	84.993E-3	87.679	2.07	PASS
4	11.927E-3	12.303	387.00E-3	PASS
5	78.359E-3	80.836	1.03	PASS
6	9.881E-3	10.193	270.00E-3	PASS
7	69.126E-3	71.311	693.00E-3	PASS
8	8.267E-3	8.529	207.00E-3	PASS
9	58.357E-3	60.201	360.00E-3	PASS
10	6.547E-3	6.754	165.60E-3	PASS
11	47.583E-3	49.087	297.00E-3	PASS
12	5.185E-3	5.348	138.00E-3	PASS
13	37.170E-3	38.344	189.00E-3	PASS
14	4.038E-3	4.165	118.29E-3	PASS
15	27.736E-3	28.613	135.00E-3	PASS
16	3.500E-3	3.611	103.50E-3	PASS
17	20.254E-3	20.894	119.11E-3	PASS
18	3.329E-3	3.434	92.00E-3	PASS
19	15.374E-3	15.859	106.58E-3	PASS
20	2.719E-3	2.805	82.80E-3	PASS
21	12.212E-3	12.598	96.43E-3	PASS
22	2.801E-3	2.890	75.28E-3	PASS
23	9.559E-3	9.861	88.05E-3	PASS
24	2.203E-3	2.273	68.99E-3	PASS
25	7.378E-3	7.611	81.00E-3	PASS
26	2.242E-3	2.313	63.69E-3	PASS
27	5.708E-3	5.888	75.00E-3	PASS
28	1.806E-3	1.863	59.14E-3	PASS
29	4.395E-3	4.534	69.83E-3	PASS
30	1.753E-3	1.809	55.20E-3	PASS
31	3.655E-3	3.771	65.32E-3	PASS
32	1.647E-3	1.699	51.75E-3	PASS
33	3.082E-3	3.179	61.36E-3	PASS
34	1.524E-3	1.573	48.71E-3	PASS
35	3.289E-3	3.393	57.86E-3	PASS
36	1.453E-3	1.499	46.00E-3	PASS
37	3.030E-3	3.126	54.73E-3	PASS
38	1.382E-3	1.425	43.58E-3	PASS
39	2.997E-3	3.092	51.92E-3	PASS
40	1.318E-3	1.359	41.40E-3	PASS

### Maximum harmonic current results

Hn	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [A]	Result
1	276.229E-3	100.000		
2	49.611E-3	17.960	2.16	PASS
3	256.389E-3	92.817	4.60	PASS
4	45.105E-3	16.329	860.00E-3	PASS
5	227.609E-3	82.399	2.28	PASS
6	38.351E-3	13.884	600.00E-3	PASS
7	188.833E-3	68.361	1.54	PASS
8	30.425E-3	11.014	460.00E-3	PASS
9	144.568E-3	52.337	800.00E-3	PASS
10	22.711E-3	8.222	368.00E-3	PASS
11	101.969E-3	36.915	660.00E-3	PASS
12	16.465E-3	5.961	306.66E-3	PASS
13	63.669E-3	23.050	420.00E-3	PASS
14	13.133E-3	4.754	262.86E-3	PASS
15	34.857E-3	12.619	300.00E-3	PASS
16	11.470E-3	4.152	230.00E-3	PASS
17	24.083E-3	8.719	264.70E-3	PASS
18	10.625E-3	3.846	204.44E-3	PASS
19	17.373E-3	6.289	236.84E-3	PASS
20	9.544E-3	3.455	184.00E-3	PASS
21	18.539E-3	6.712	214.28E-3	PASS
22	8.057E-3	2.917	167.28E-3	PASS
23	18.063E-3	6.539	195.66E-3	PASS
24	6.742E-3	2.441	153.32E-3	PASS
25	14.415E-3	5.219	180.00E-3	PASS
26	5.758E-3	2.084	141.54E-3	PASS
27	9.988E-3	3.616	166.66E-3	PASS
28	5.650E-3	2.045	131.42E-3	PASS
29	7.682E-3	2.781	155.18E-3	PASS
30	5.472E-3	1.981	122.66E-3	PASS
31	6.088E-3	2.204	145.16E-3	PASS
32	5.198E-3	1.882	115.00E-3	PASS
33	6.069E-3	2.197	136.36E-3	PASS
34	4.737E-3	1.715	108.24E-3	PASS
35	6.058E-3	2.193	128.58E-3	PASS
36	4.353E-3	1.576	102.22E-3	PASS
37	5.206E-3	1.885	121.62E-3	PASS
38	4.054E-3	1.468	96.84E-3	PASS
39	4.418E-3	1.599	115.38E-3	PASS
40	3.805E-3	1.377	92.00E-3	PASS

### Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.47	100.639		
2	75.55E-3	0.033	0.2	PASS
3	197.23E-3	0.086	0.9	PASS
4	18.75E-3	0.008	0.2	PASS
5	126.65E-3	0.055	0.4	PASS
6	16.12E-3	0.007	0.2	PASS
7	166.06E-3	0.072	0.3	PASS
8	18.71E-3	0.008	0.2	PASS
9	156.85E-3	0.068	0.2	PASS
10	18.17E-3	0.008	0.2	PASS
11	113.10E-3	0.049	0.1	PASS
12	19.65E-3	0.009	0.1	PASS
13	80.79E-3	0.035	0.1	PASS
14	15.01E-3	0.007	0.1	PASS
15	56.88E-3	0.025	0.1	PASS
16	15.92E-3	0.007	0.1	PASS
17	61.76E-3	0.027	0.1	PASS
18	14.48E-3	0.006	0.1	PASS
19	47.34E-3	0.021	0.1	PASS
20	13.83E-3	0.006	0.1	PASS
21	45.21E-3	0.020	0.1	PASS
22	13.84E-3	0.006	0.1	PASS
23	27.70E-3	0.012	0.1	PASS
24	14.40E-3	0.006	0.1	PASS
25	31.70E-3	0.014	0.1	PASS
26	11.00E-3	0.005	0.1	PASS
27	30.41E-3	0.013	0.1	PASS
28	11.19E-3	0.005	0.1	PASS
29	32.86E-3	0.014	0.1	PASS
30	14.23E-3	0.006	0.1	PASS
31	23.80E-3	0.010	0.1	PASS
32	8.75E-3	0.004	0.1	PASS
33	27.46E-3	0.012	0.1	PASS
34	9.50E-3	0.004	0.1	PASS
35	32.11E-3	0.014	0.1	PASS
36	9.21E-3	0.004	0.1	PASS
37	32.10E-3	0.014	0.1	PASS
38	9.50E-3	0.004	0.1	PASS
39	16.84E-3	0.007	0.1	PASS
40	9.38E-3	0.004	0.1	PASS



### Harmonic current results - DS: 32

Hn	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [A]	Result
1	66.852E-3	100.000		
2	5.972E-3	8.934	1.08	PASS
3	55.850E-3	83.543	2.30	PASS
4	6.471E-3	9.679	430.00E-3	PASS
5	52.787E-3	78.961	1.14	PASS
6	5.257E-3	7.863	300.00E-3	PASS
7	48.158E-3	72.037	770.00E-3	PASS
8	4.547E-3	6.801	230.00E-3	PASS
9	42.549E-3	63.647	400.00E-3	PASS
10	3.818E-3	5.711	184.00E-3	PASS
11	36.926E-3	55.237	330.00E-3	PASS
12	3.192E-3	4.775	153.33E-3	PASS
13	31.052E-3	46.449	210.00E-3	PASS
14	2.417E-3	3.615	131.43E-3	PASS
15	25.172E-3	37.653	150.00E-3	PASS
16	2.041E-3	3.053	115.00E-3	PASS
17	19.656E-3	29.402	132.35E-3	PASS
18	1.902E-3	2.845	102.22E-3	PASS
19	14.801E-3	22.139	118.42E-3	PASS
20	1.628E-3	2.436	92.00E-3	PASS
21	10.998E-3	16.452	107.14E-3	PASS
22	2.041E-3	3.053	83.64E-3	PASS
23	7.709E-3	11.532	97.83E-3	PASS
24	1.552E-3	2.321	76.66E-3	PASS
25	5.163E-3	7.722	90.00E-3	PASS
26	1.641E-3	2.454	70.77E-3	PASS
27	3.445E-3	5.154	83.33E-3	PASS
28	1.127E-3	1.686	65.71E-3	PASS
29	2.361E-3	3.532	77.59E-3	PASS
30	1.109E-3	1.658	61.33E-3	PASS
31	2.662E-3	3.982	72.58E-3	PASS
32	1.059E-3	1.585	57.50E-3	PASS
33	2.977E-3	4.453	68.18E-3	PASS
34	981.588E-6	1.468	54.12E-3	PASS
35	3.370E-3	5.040	64.29E-3	PASS
36	971.482E-6	1.453	51.11E-3	PASS
37	3.123E-3	4.672	60.81E-3	PASS
38	949.086E-6	1.420	48.42E-3	PASS
39	3.019E-3	4.515	57.69E-3	PASS
40	952.084E-6	1.424	46.00E-3	PASS

Caution: Results related to the 100% limit values

### Harmonic voltage results - DS: 32

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.45	100.632		
2	72.22E-3	0.031	0.2	PASS
3	116.20E-3	0.051	0.9	PASS
4	17.00E-3	0.007	0.2	PASS
5	7.20E-3	0.003	0.4	PASS
6	5.24E-3	0.002	0.2	PASS
7	43.95E-3	0.019	0.3	PASS
8	7.91E-3	0.003	0.2	PASS
9	59.42E-3	0.026	0.2	PASS
10	3.04E-3	0.001	0.2	PASS
11	15.78E-3	0.007	0.1	PASS
12	10.36E-3	0.005	0.1	PASS
13	55.71E-3	0.024	0.1	PASS
14	1.19E-3	0.001	0.1	PASS
15	21.50E-3	0.009	0.1	PASS
16	3.48E-3	0.002	0.1	PASS
17	23.72E-3	0.010	0.1	PASS
18	6.98E-3	0.003	0.1	PASS
19	42.12E-3	0.018	0.1	PASS
20	4.43E-3	0.002	0.1	PASS
21	19.25E-3	0.008	0.1	PASS
22	5.84E-3	0.003	0.1	PASS
23	13.35E-3	0.006	0.1	PASS
24	6.95E-3	0.003	0.1	PASS
25	14.17E-3	0.006	0.1	PASS
26	1.67E-3	0.001	0.1	PASS
27	23.08E-3	0.010	0.1	PASS
28	4.14E-3	0.002	0.1	PASS
29	18.43E-3	0.008	0.1	PASS
30	7.25E-3	0.003	0.1	PASS
31	9.95E-3	0.004	0.1	PASS
32	2.89E-3	0.001	0.1	PASS
33	12.05E-3	0.005	0.1	PASS
34	2.71E-3	0.001	0.1	PASS
35	25.42E-3	0.011	0.1	PASS
36	1.81E-3	0.001	0.1	PASS
37	10.90E-3	0.005	0.1	PASS
38	3.49E-3	0.002	0.1	PASS
39	6.58E-3	0.003	0.1	PASS
40	5.74E-3	0.002	0.1	PASS

### Power and THD results - DS: 32

True power P:	102.15W	Apparent power S:	250.37VA
Reactive power Q:	228.58var	Power factor:	0.408
THD (U):	0.001	THD (I):	1.84
Crest Factor (U):	1.413	Crest Factor (I):	3.481

### 3.4 VOLTAGE FLUCTUATION AND FLICKERS

#### 3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	$\leq 1.0$ , Tp= 10 min.	$\leq 1.0$ , Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	$\leq 0.65$ , Tp=2 hr.	Long Term Flicker Indicator
dc	$\leq 3\%$	$\leq 3.3\%$	Relative Steady-State V-Chang
dmax	$\leq 4\%$	$\leq 4\%$	Maximum Relative V-change
d (t)	N/A	$\leq 3.3\%$ for > 500 ms	Relative V-change characteristic

##### 3.4.1.1 TEST PROCEDURE

###### a. Harmonic Current Test:

Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

###### b. Fluctuation and Flickers Test:

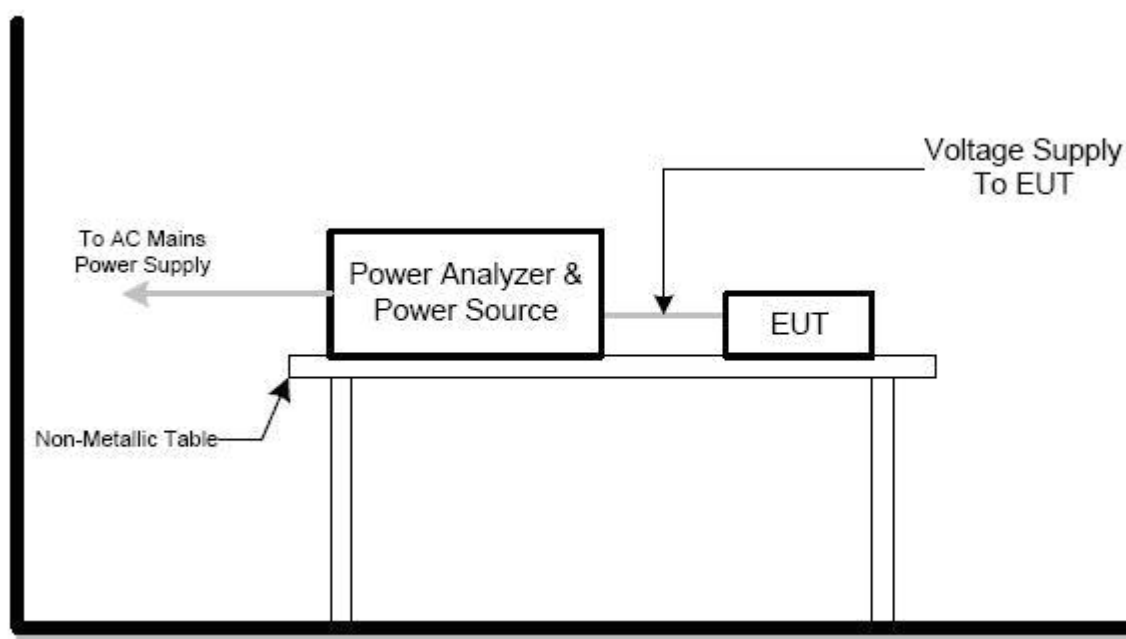
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

##### 3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

##### 3.4.1.3 TEST SETUP



### 3.4.2 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

### Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.005	3.30	PASS
dmax [%]	0.071	7.00	PASS
dt [s]	0.000	0.50	PASS

## 4. EMC IMMUNITY TEST

### 4.1 GENERAL PERFORMANCE CRITERIA

According to **EN 55020** standard, the general performance criteria as following:

<b>Criterion A</b>	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
<b>Criterion B</b>	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
<b>Criterion C</b>	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

### 4.2 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

### 4.3 ESD TESTING

#### 4.3.1 TEST SPECIFICATION

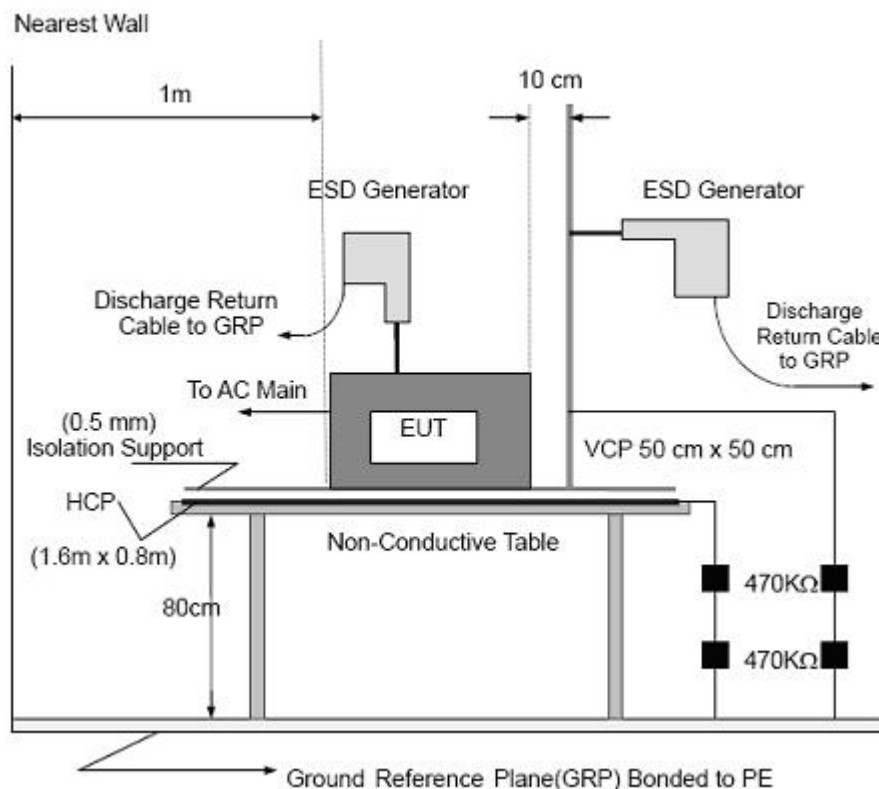
Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge : 2kV/4kV/8kV (Direct) Contact Discharge : 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

#### 4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.  
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.  
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.  
Vertical Coupling Plane (VCP):  
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.  
Horizontal Coupling Plane (HCP):  
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.
- b. Air discharges at insulation surfaces of the EUT.  
It was at least ten single discharges with positive and negative at the same selected point.

### 4.3.3 TEST SETUP



Note:

#### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

#### FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

#### 4.3.4 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	45%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP											A	A					B	PASS
VCP											A	A						PASS
A1	A	A	A	A	A	A												PASS
A2	A	A	A	A	A	A												PASS
C1											A	A						PASS
C2											A	A						PASS
C3											A	A						PASS
C4											A	A						PASS

Note:

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:  
Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:  
1.left side 2.right side 3.front side 4.rear side
- 5) N/A - denotes test is not applicable in this test report



#### 4.3.5 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED



#### 4.4 EFT/BURST TESTING

##### 4.4.1 TEST SPECIFICATION

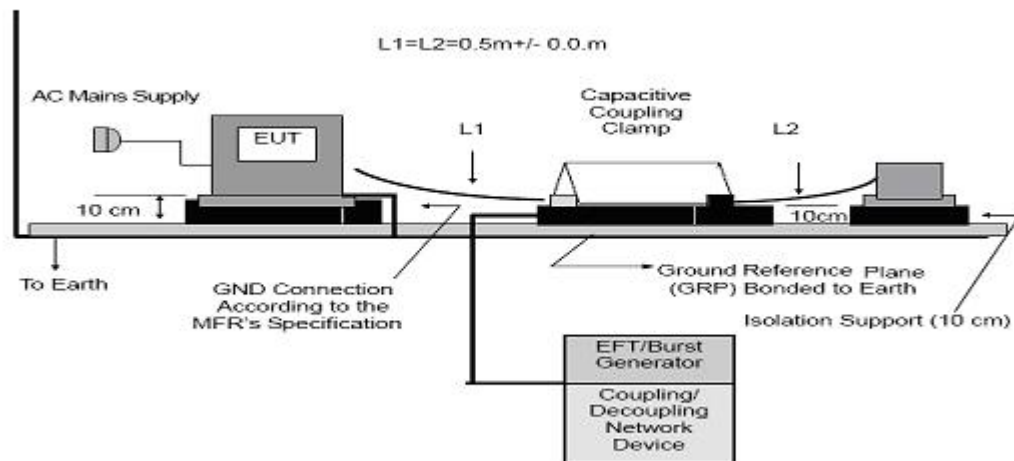
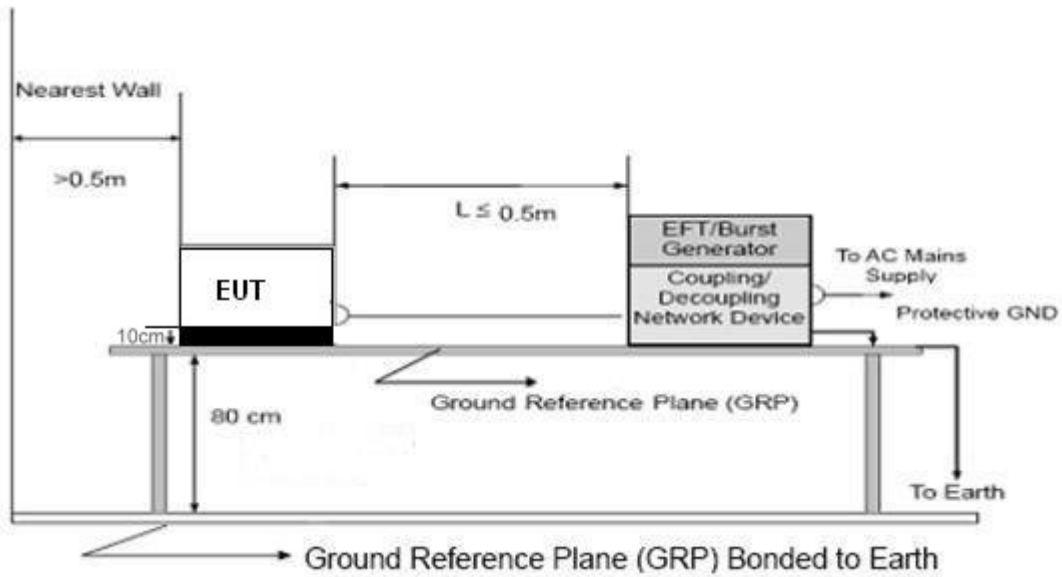
Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line : 1 kV Signal/Control Line : 0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

##### 4.4.2 TEST PROCEDURE

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m\*1m metallic sheet with 0.65mm minimum thickness. The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute

#### 4.4.3 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

##### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

#### 4.4.4 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

Coupling Line		Test level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	A	A	A	A					B	PASS
	N	A	A	A	A						PASS
	PE	A	A	A	A						PASS
	L+N	A	A	A	A						PASS
	L+PE	A	A	A	A						PASS
	N+PE	A	A	A	A						PASS
	L+N+PE	A	A	A	A						PASS
DC Line											
Signal Line											

#### Note:

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

## 4.5 INPUT IMMUNITY TO RF VOLTAGES (DIFFERENTIAL MODE) (S1)

### 4.5.1 TEST LIMIT

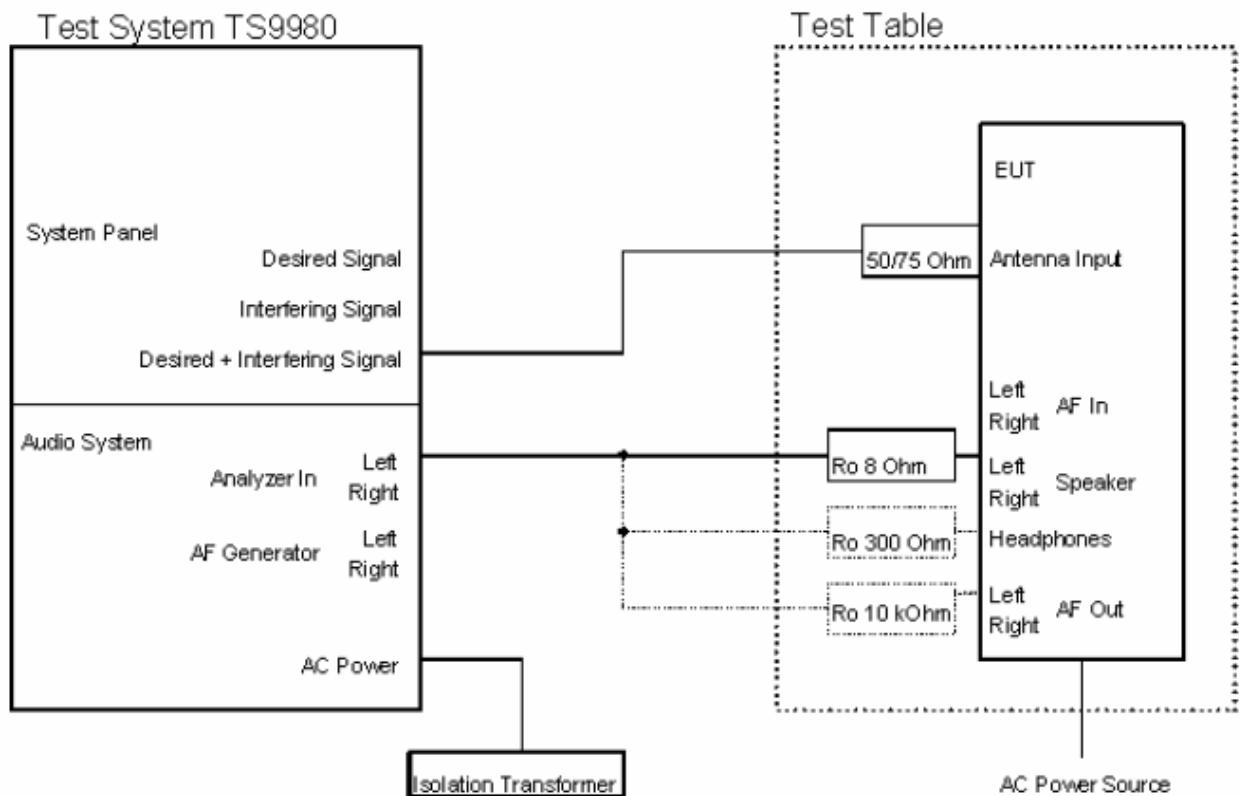
Wanted channel  N	Unwanted signal in channel M						Type
	Level dB(μV)						
	M = N – 5	N – 1	N + 1	N + 5 <sup>a</sup>	N + 9 <sup>a</sup>	N + 11	
N <sub>I</sub> and N <sub>III</sub> and N <sub>H</sub>	–	73	73	–	68 <sup>b</sup>	–	A
	–	61	61	–	56 <sup>b</sup>	–	B
	70	73 – x	73 – x	70	68 – x <sup>b</sup>	68	C or C1
	63	73 – y	73 – y	63	68 – y <sup>b</sup>	61	C2
	70	–	–	70	–	68	D
N <sub>IV</sub>	–	77	77	80	68	–	A
	–	65	65	68	56	–	B
	74	77 – x	77 – x	80 – x	68 – x	–	C or C1
	67	77 – y	77 – y	80 – y	68 – y	–	C2
	74	–	–	–	–	–	D
N <sub>V</sub>	80	77	77	80	–	–	A
	68	65	65	68	–	–	B
	80 – x	77 – x	77 – x	80 – x	62	–	C or C1
	80 – y	77 – y	77 – y	80 – y	55	–	C2
	–	–	–	–	62	–	D
For systems B and G                    x = 13 dB, y = 20 dB For system I (monophonic only)    x = 10 dB							
NOTE 1    “x” is the relative level (dB) of the first sound carrier (mono sound channel) with respect to the picture carrier. “y” is the relative level (dB) of the second sound carrier (stereo sound channel) with respect to the picture carrier.							
NOTE 2    (For China only). For systems D-PAL and K-PAL, Table 5 applies with the addition of channels (M) N – 4 and N + 4, with the same limits of channels N – 5 and N + 5 and x = 10 dB.							
NOTE 3    N ± m indicates the frequency of the picture carrier of the tuned television channel, plus or minus m times the channel frequency bandwidth. The test signal should be applied at this frequency if a limit value is tabulated.							
<sup>a</sup> These levels only apply for television systems with a channel spacing of 8 MHz and an IF of 38,9 MHz. For other channel spacing and IF frequencies different image channel or local oscillator interference constraints may apply.							
<sup>b</sup> Only for hyperband N <sub>H</sub> .							

Wanted channel  N	Unwanted signal		
	Frequency MHz	Level dB( $\mu$ V) $n_t$ (75 $\Omega$ )	Type
N <sub>I</sub>	26 to 30	89	E
N <sub>III</sub>	26 to 30	104	E
NOTE 1 The limits for the wanted channel N <sub>I</sub> apply also to the wanted channel N <sub>III</sub> when band II is used for systems D-SECAM, K-SECAM.			
NOTE 2 For the wanted audio signal see 5.3.2.2.			

#### 4.5.2 TEST PROCEDURE

- a. Measurement was performed in shielded room.  
Instruments used were following CISPR 16-1 and EN 55020.  
Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.3.2 of EN55020.

#### 4.5.3 TEST SETUP



#### 4.5.4 TEST RESULTS

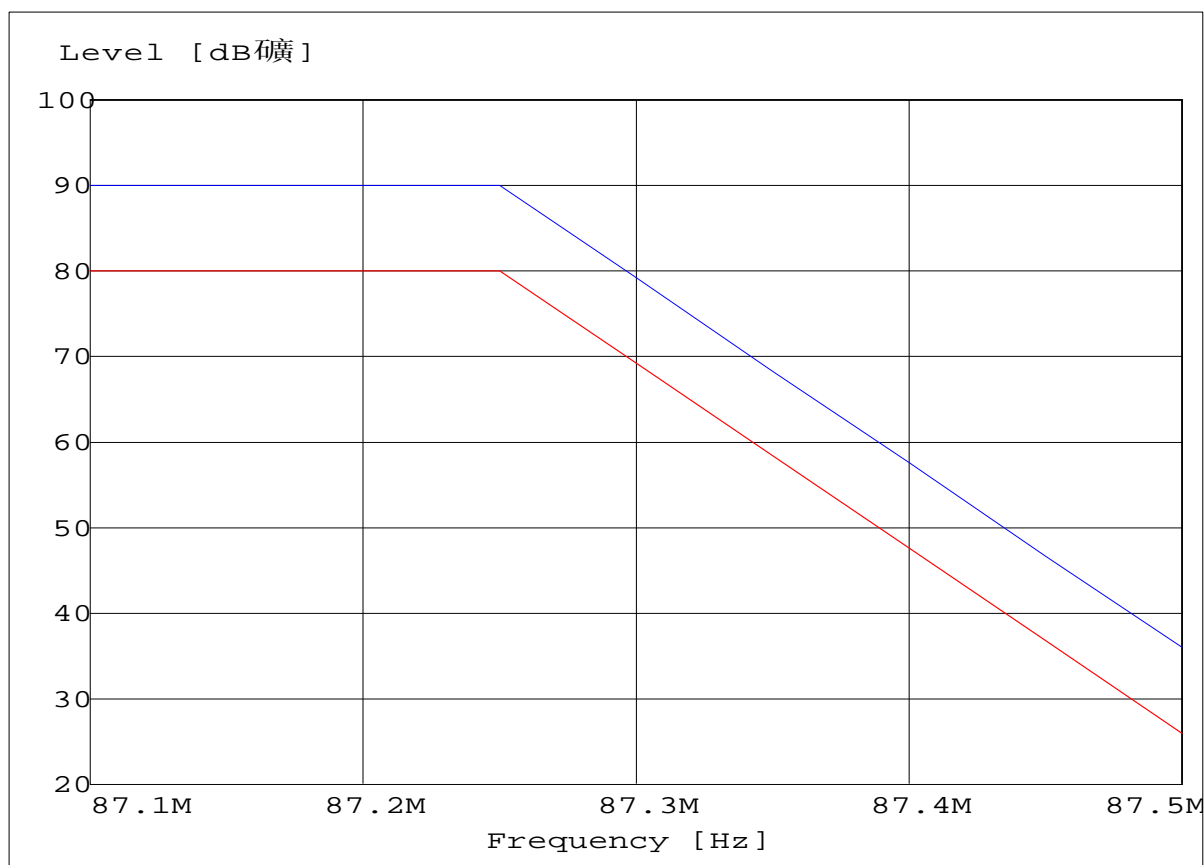
EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25℃	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test:** *Input Immunity S1 <700-0105-005>*

**Test Mode:** *Combi Device - Stereo*  
**Operating Mode:** *FM*  
**Frequency:** *87.600000 MHz*

**Monitor:** *Speaker*  
**S/N:** *41.2 dB*  
**AF Level:** *49.3 mW*

**Interf. Signal:** *Below FM,*

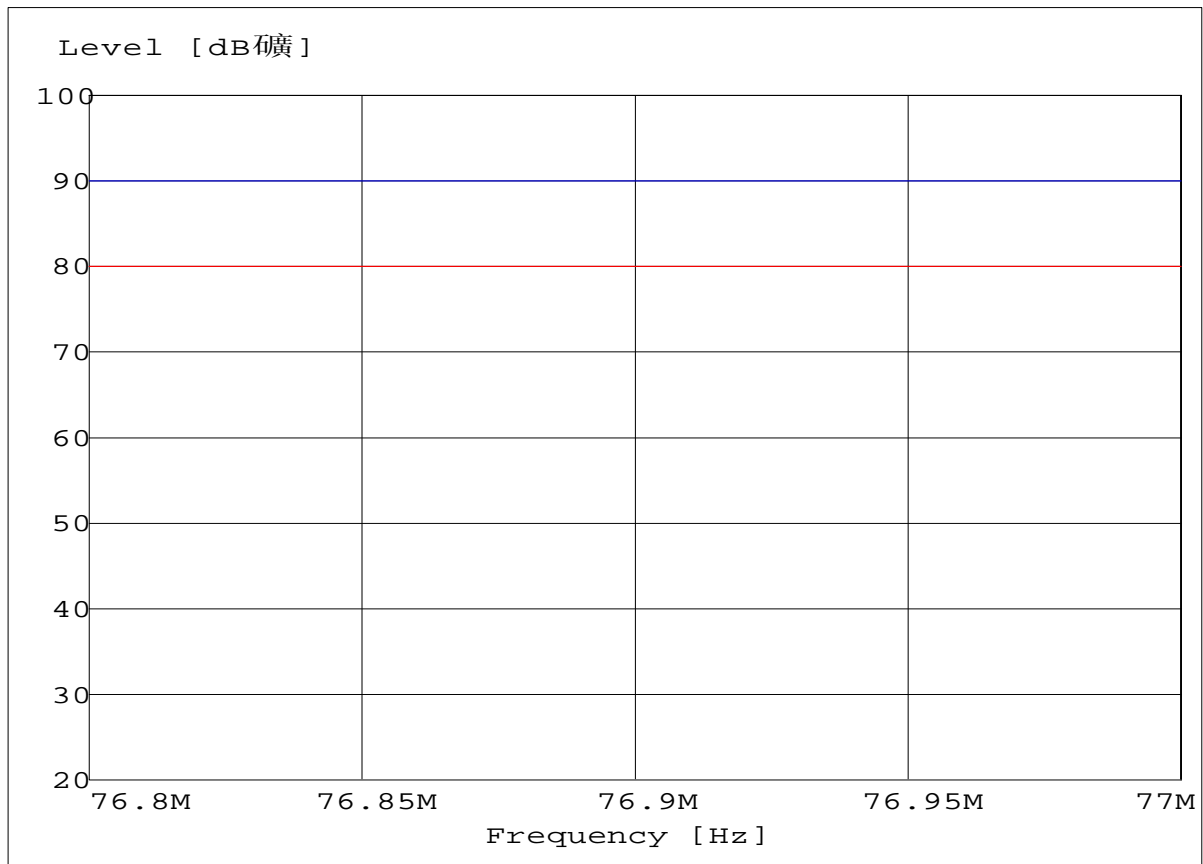


**Test: Input Immunity S1 <700-0105-005>**

Test Mode: Combi Device - Stereo  
Operating Mode: FM  
Frequency: 87.600000 MHz

Monitor: Speaker  
S/N: 40.4 dB  
AF Level: 49.2 mW

**Interf. Signal: IF Test b. FM fo,**



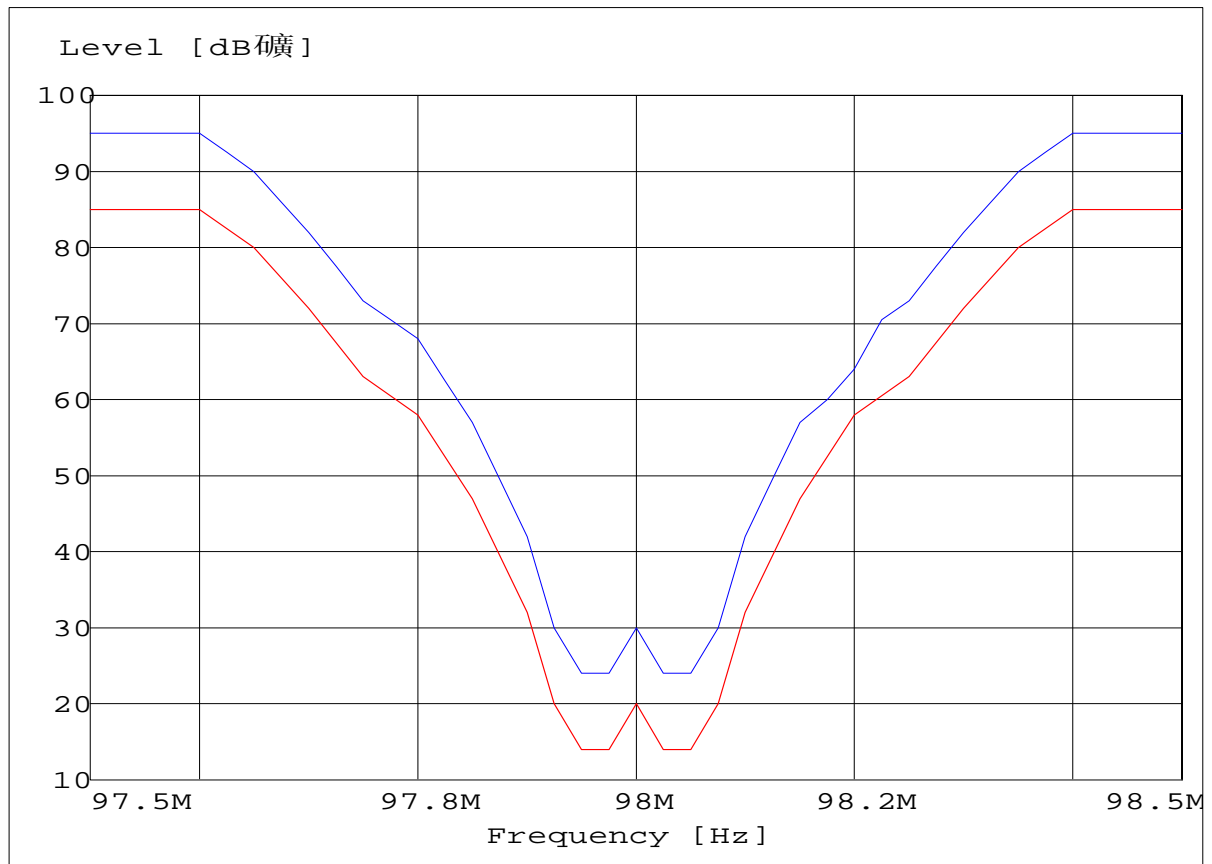


**Test: Input Immunity S1 <700-0105-005>**

Test Mode: Combi Device - Stereo  
 Operating Mode: FM  
 Frequency: 98.000000 MHz

Monitor: Speaker  
 S/N: 41.5 dB  
 AF Level: 46.3 mW

**Interf. Signal: Inside FM,**

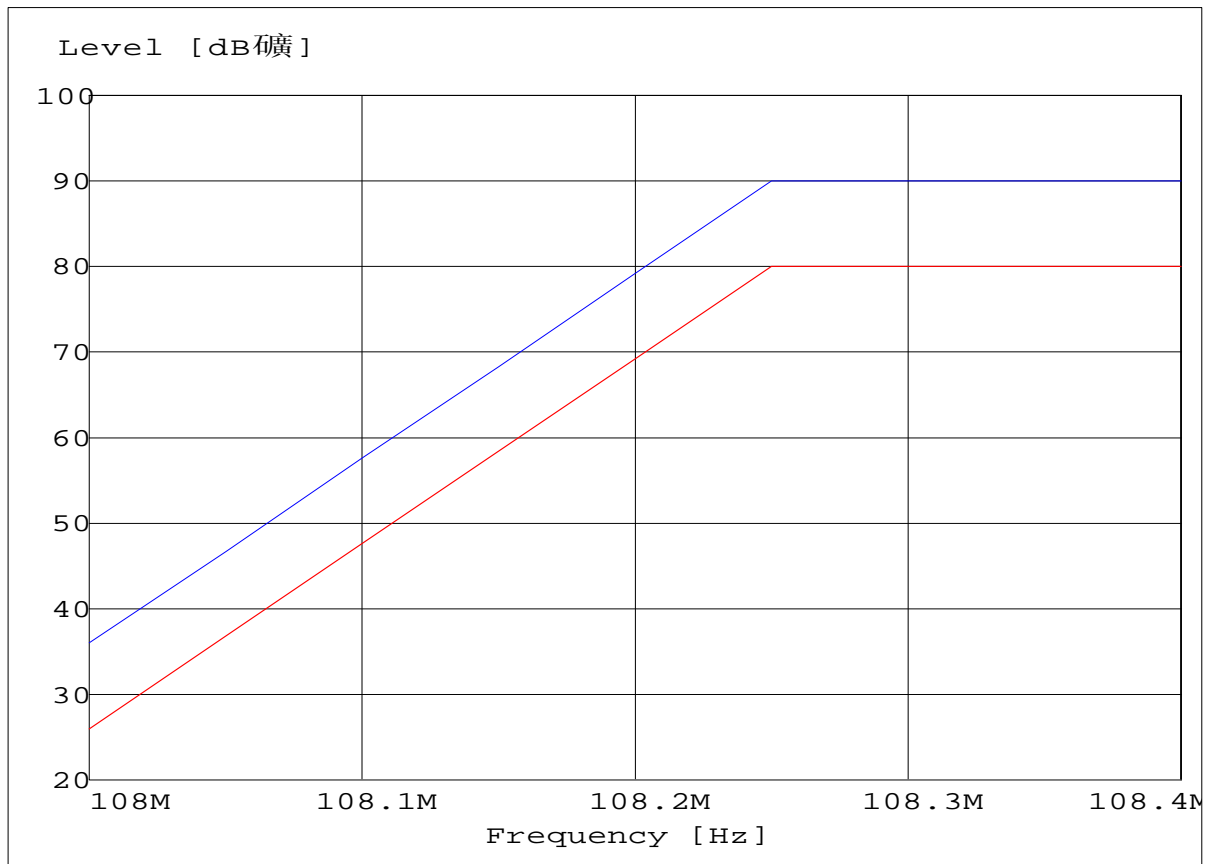


**Test: Input Immunity S1 <700-0105-005>**

Test Mode: Combi Device - Stereo  
Operating Mode: FM  
Frequency: 107.900000 MHz

Monitor: Speaker  
S/N: 33.1 dB  
AF Level: 48.5 mW

**Interf. Signal: Above FM,**

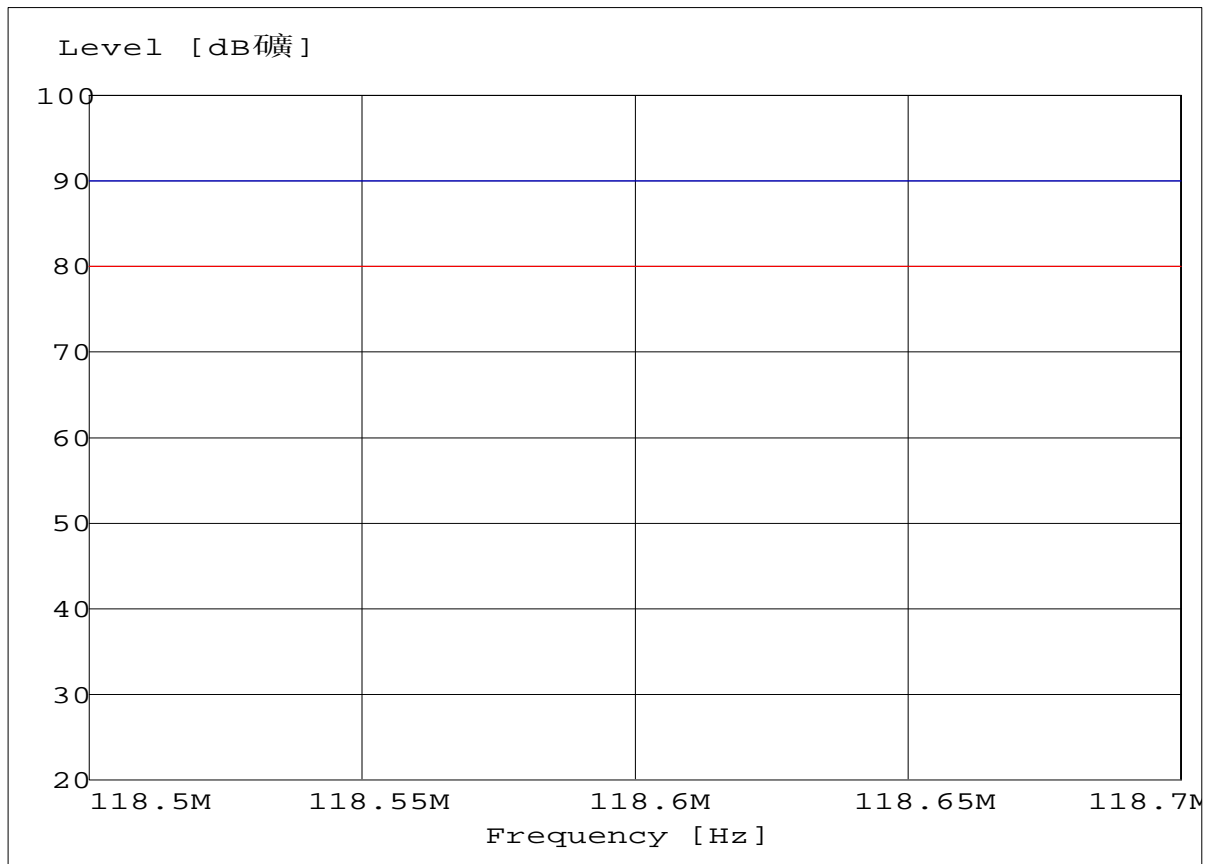


**Test: Input Immunity S1 <700-0105-005>**

Test Mode: Combi Device - Stereo  
Operating Mode: FM  
Frequency: 107.900000 MHz

Monitor: Speaker  
S/N: 32.3 dB  
AF Level: 48.5 mW

**Interf. Signal: IF Test a. FM fo,**

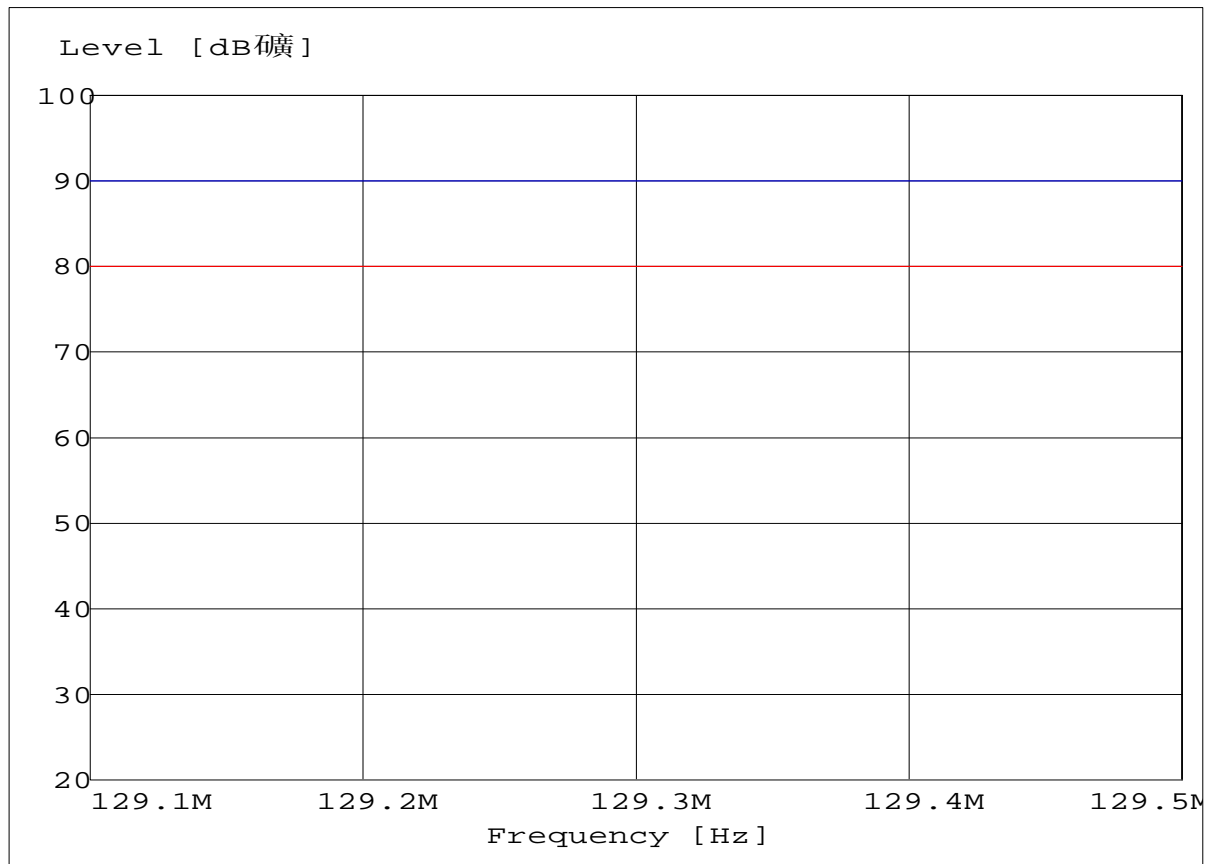


**Test: Input Immunity S1 <700-0105-005>**

Test Mode: Combi Device - Stereo  
Operating Mode: FM  
Frequency: 107.900000 MHz

Monitor: Speaker  
S/N: 33.1 dB  
AF Level: 48.5 mW

**Interf. Signal: IF Test a. FM fi,**



#### 4.6 IMMUNITY REQUIREMENTS AT MAINS, LOUDSPEAKER AND HEADPHONE OUTPUT CONNECTOR (S2A)

##### 4.6.1 LIMIT

Frequency MHz	Level dB( $\mu$ V) (e.m.f.)
0,15 to 30	130
30 to 100	120
100 to 150	120 – 110 <sup>a</sup>

<sup>a</sup> Decreasing linearly with the logarithm of the frequency.

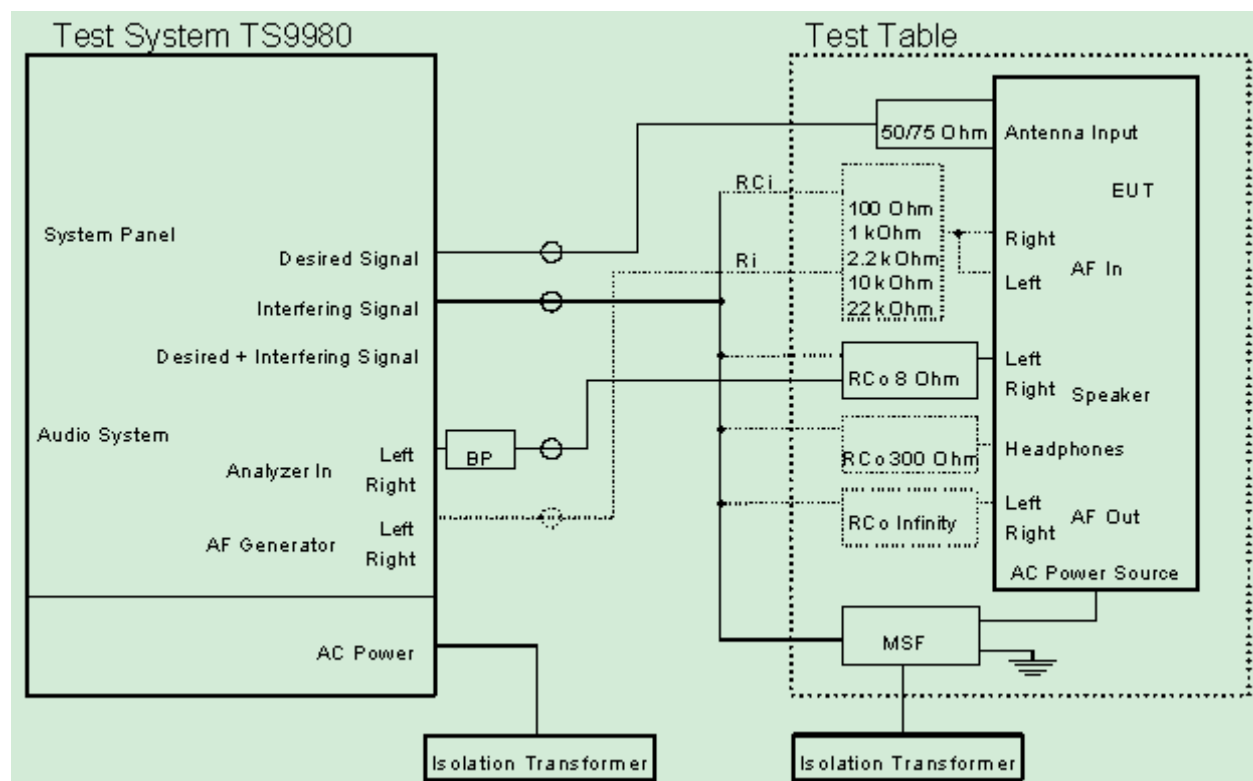
##### 4.6.2 TEST PROCEDURE

Measurement was performed in shielded room.

Instruments used were following CISPR 16-1 and EN 55020.

Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.7 of EN55020.:

##### 4.6.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.6.4 TEST RESULTS

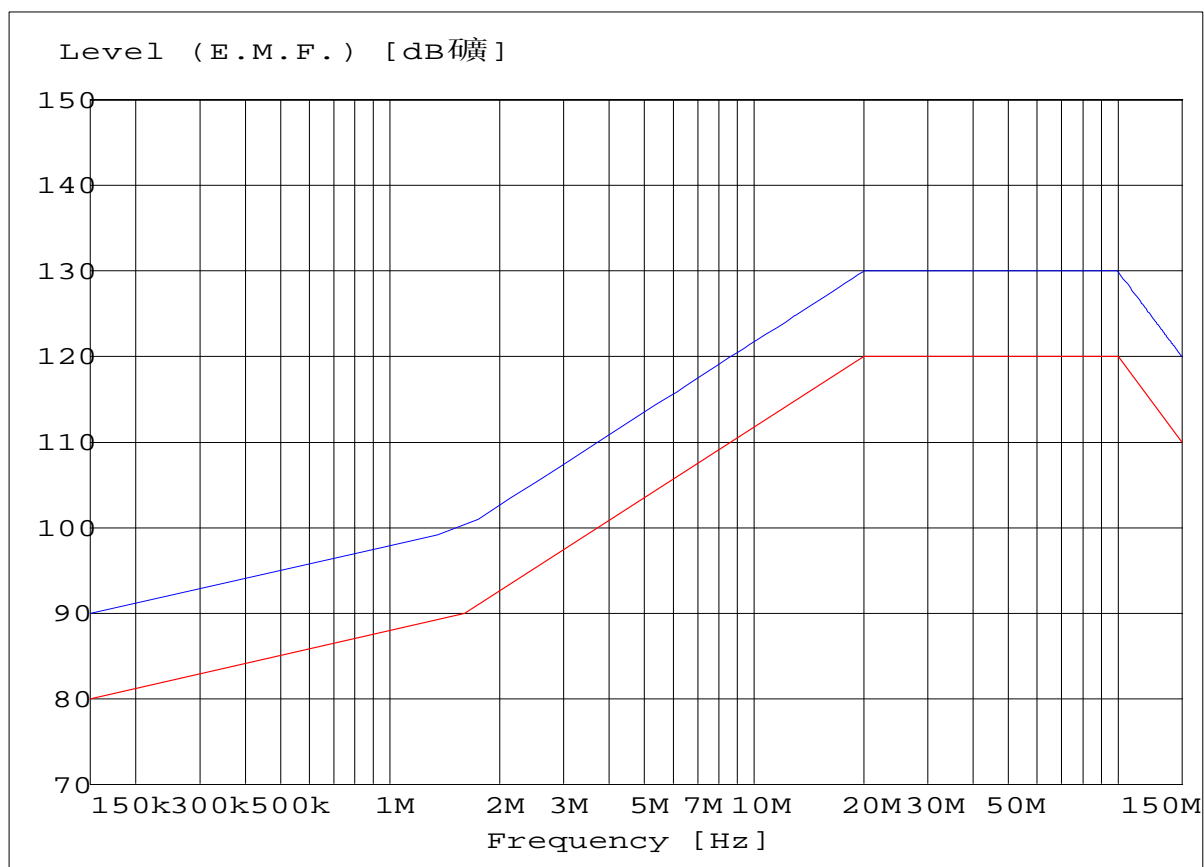
EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25℃	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test:** Immunity Conducted Voltages S2a <700-0105-005>

**Test Mode:** Combi Device -  
**Operating Mode:** AUX  
**Frequency:** -

**Monitor:** Speaker  
**S/N:** 75.5 dB  
**AF Level:** 51.3 mW

**Interf. Signal:** AUX,

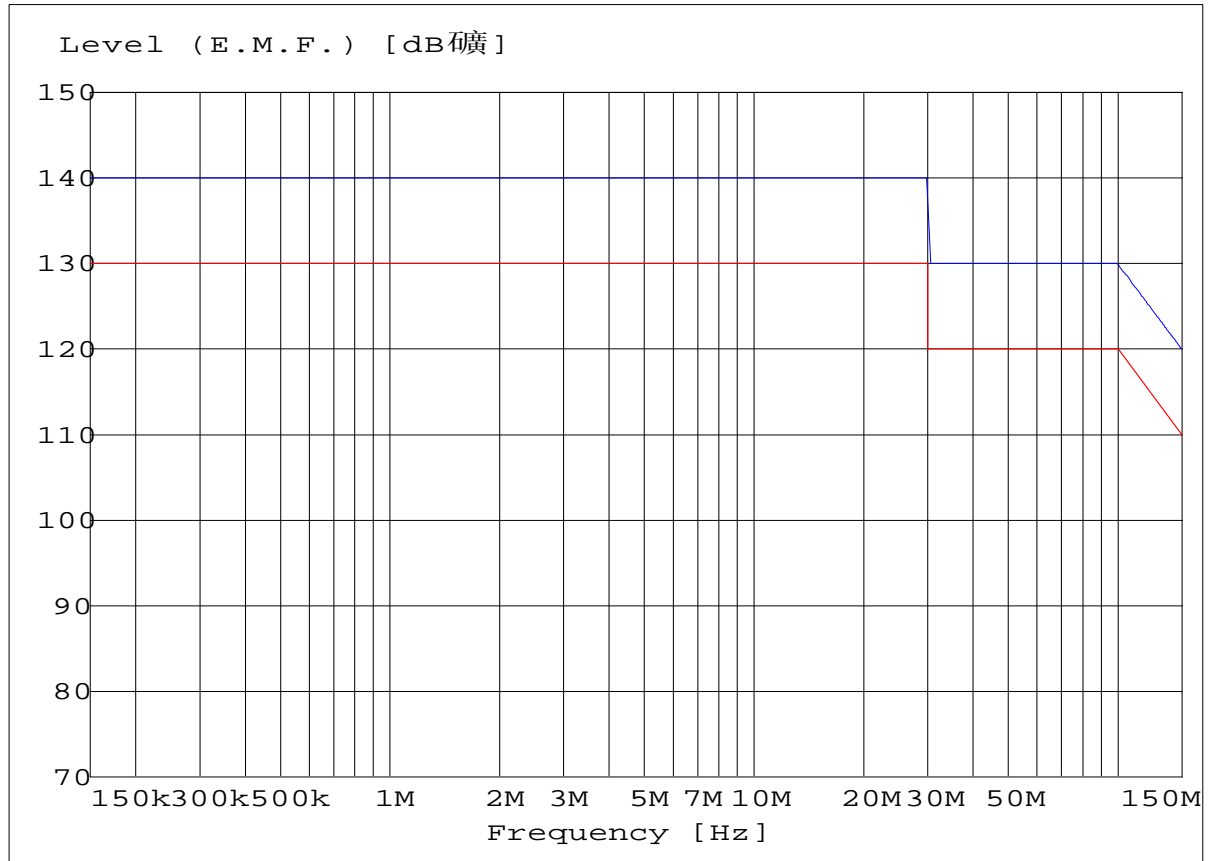


**Test: Immunity Conducted Voltages S2a <700-0105-005>**

Test Mode: Combi Device -  
 Operating Mode: AUX  
 Frequency: -

Monitor: Speaker  
 S/N: 77.5 dB  
 AF Level: 51.3 mW

**Interf. Signal: Mains,**

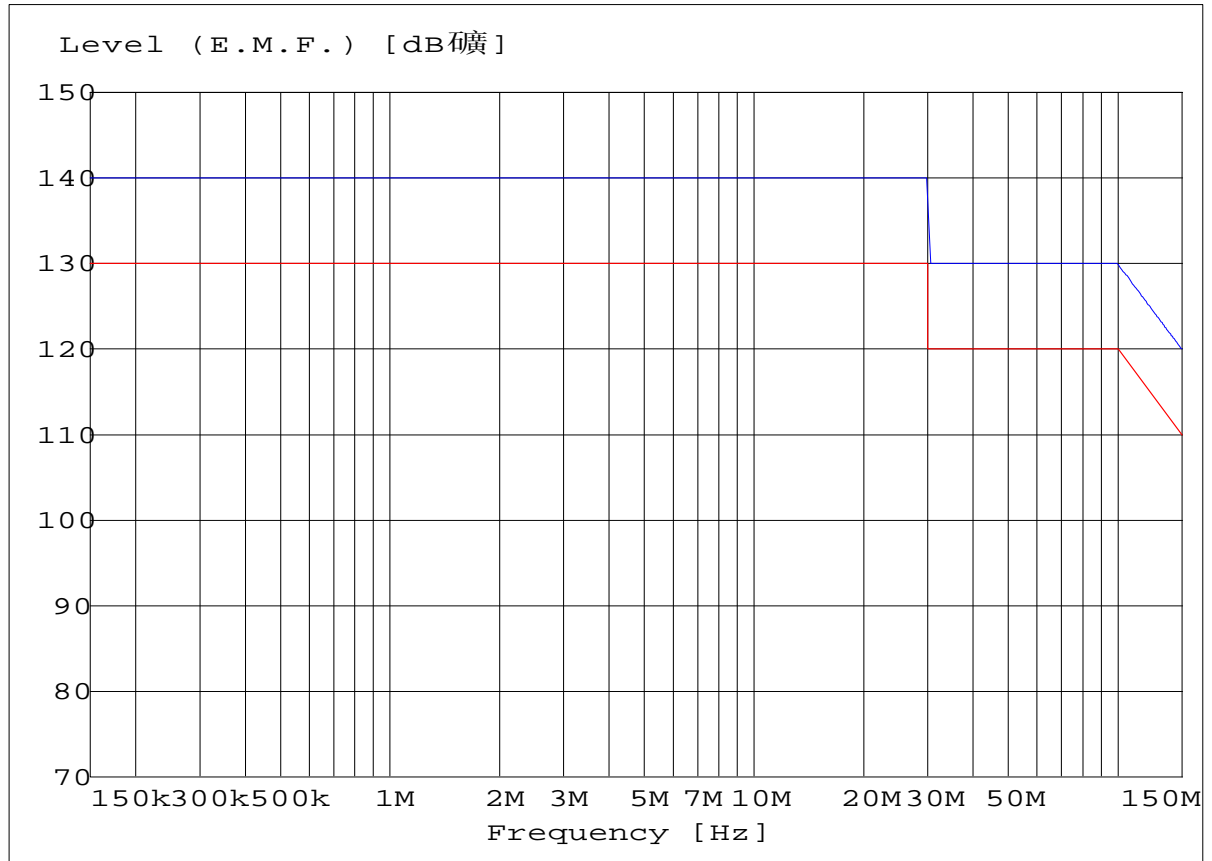


**Test: Immunity Conducted Voltages S2a <700-0105-005>**

Test Mode: Combi Device -  
 Operating Mode: iPod Play  
 Frequency: -

Monitor: Speaker  
 S/N: 79.9 dB  
 AF Level: 55.5 mW

**Interf. Signal: Mains,**



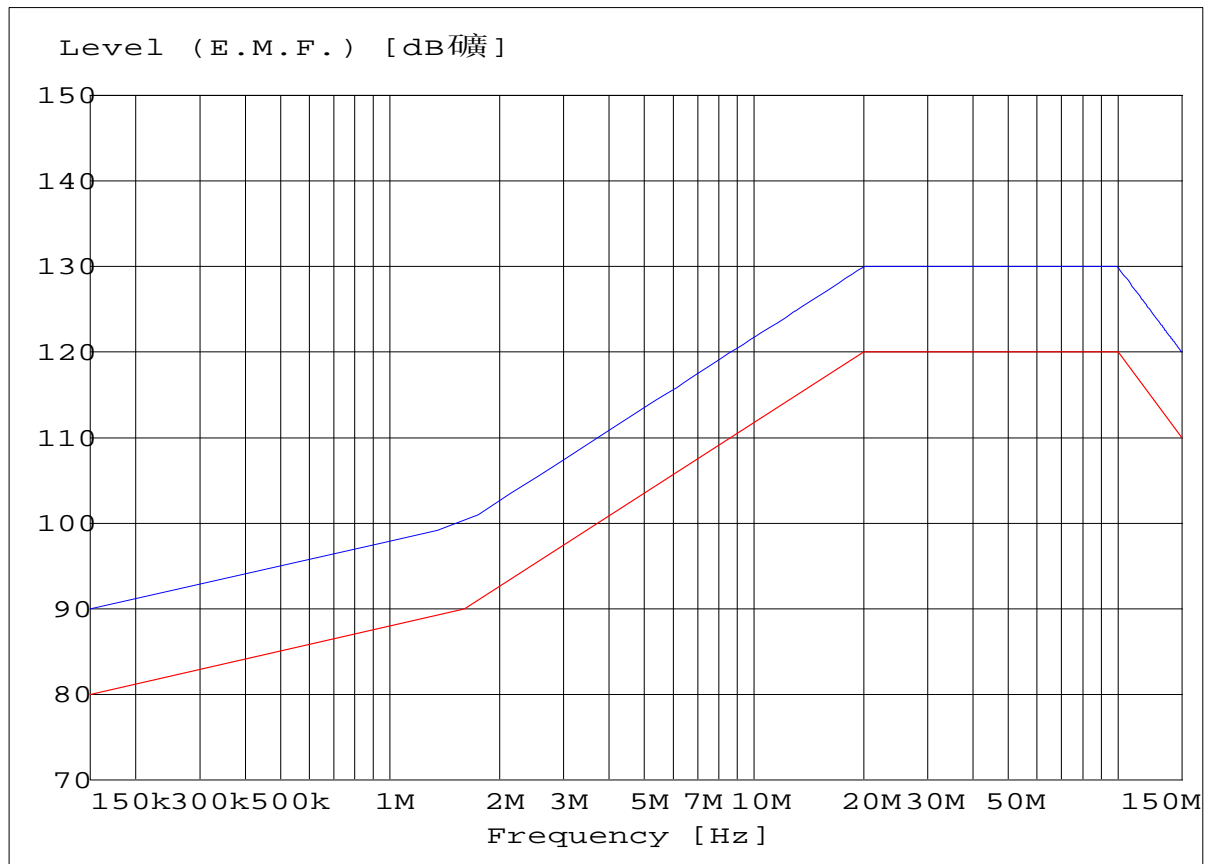


**Test: Immunity Conducted Voltages S2a <700-0105-005>**

Test Mode: Combi Device -  
 Operating Mode: iPod Play  
 Frequency: -

Monitor: Speaker  
 S/N: 79.5 dB  
 AF Level: 51.0 mW

**Interf. Signal: AUX,**

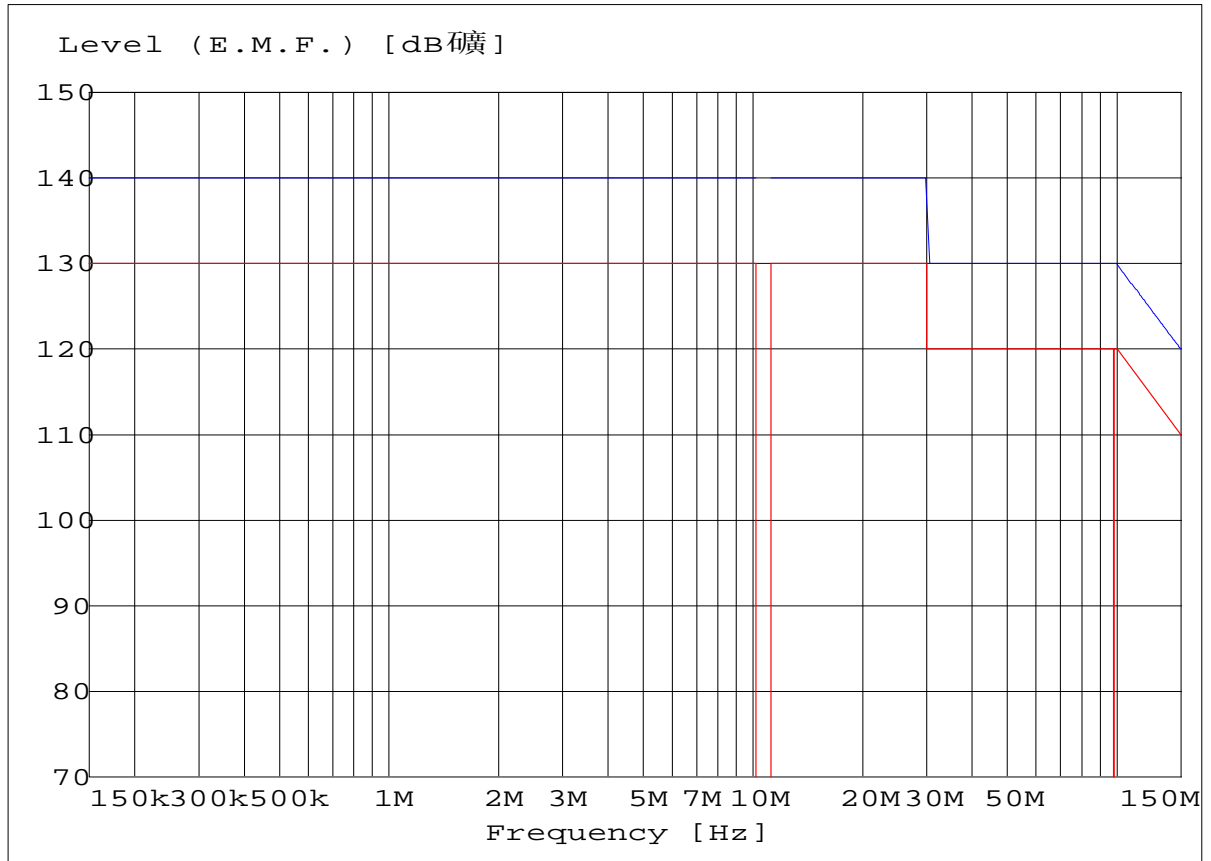


**Test: Immunity Conducted Voltages S2a <700-0105-005>**

Test Mode: Combi Device - Stereo  
Operating Mode: FM  
Frequency: 98.000000 MHz

Monitor: Speaker  
S/N: 42.1 dB  
AF Level: 54.8 mW

**Interf. Signal: Mains,**



**Test:** Immunity Conducted Voltages S2a <700-0105-005>

**Test Mode:** Combi Device - Stereo

**Monitor:**

**Speaker**

**Operating Mode:** FM

**S/N:**

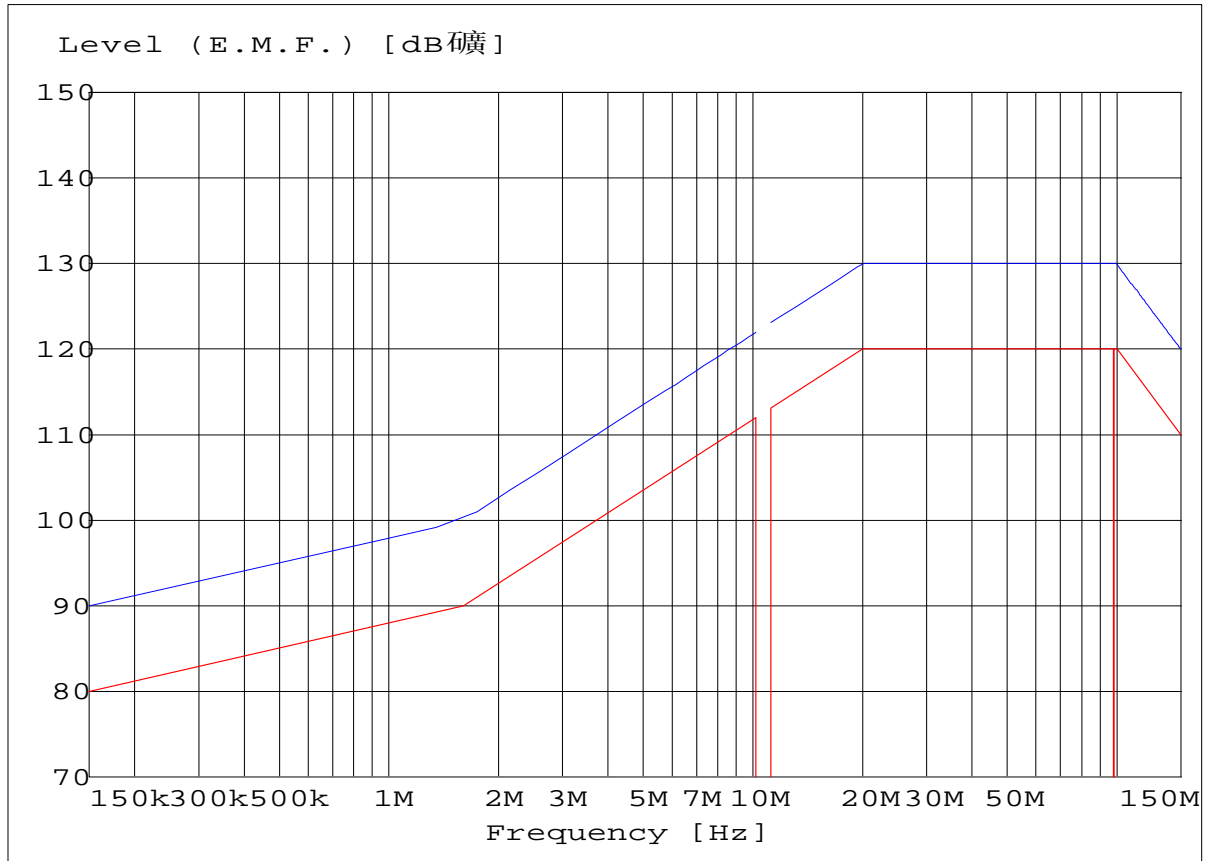
**56.8 dB**

**Frequency:** 98.000000 MHz

**AF Level:**

**45.1 mW**

**Interf. Signal:** AUX,



## 4.7 IMMUNITY TO RF VOLTAGES (COMMON MODE) AT ANTENNA TERMINATE (S2B)

### 4.7.1 TEST LIMIT

Frequency MHz	Level dB( $\mu$ V) (e.m.f.)
26 to 30	126

NOTE 1 For system L the test level in the frequency range 28 MHz to 30 MHz is 116 dB( $\mu$ V) (e.m.f.).

NOTE 2 According to the measuring procedure the immunity from conducted current is expressed by the e.m.f. level of the unwanted signal generator (Figures 5 and 6).

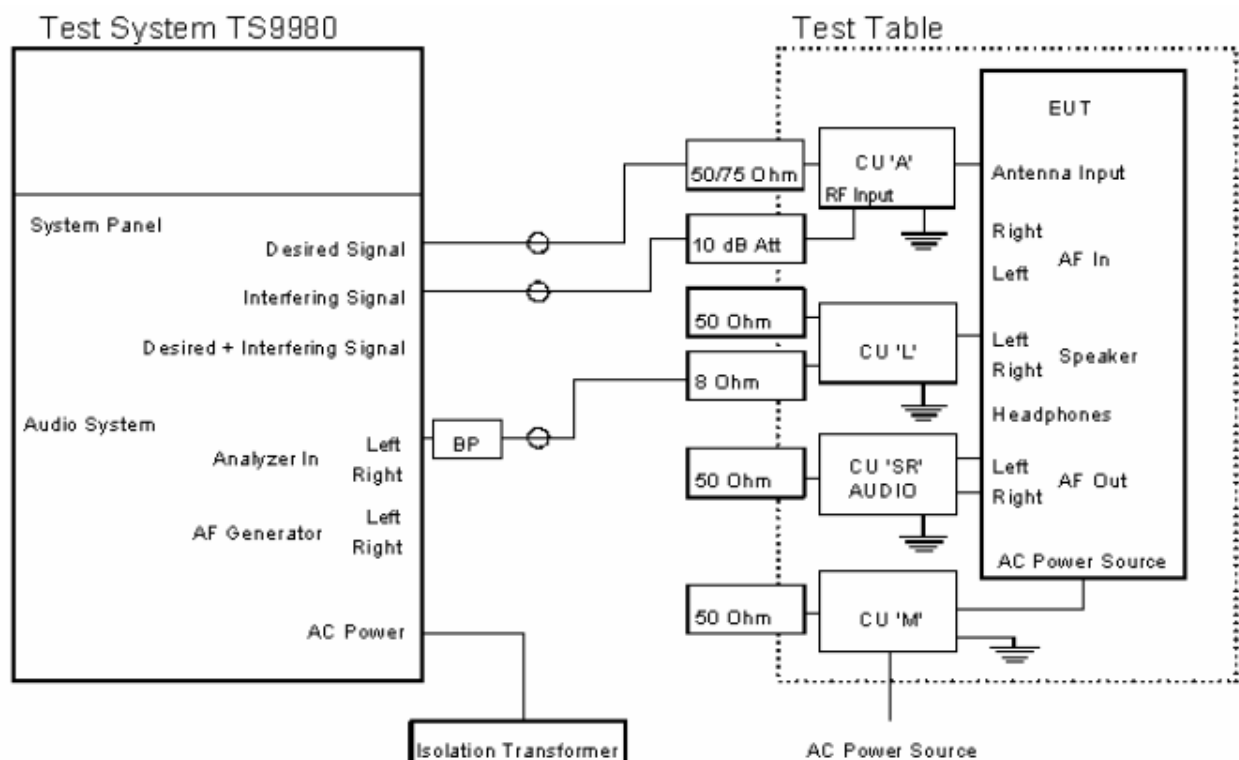
### 4.7.2 TEST PROCEDURE

Measurement was performed in shielded room.

Instruments used were following CISPR 16-1 and EN 55020.

Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.4 of EN55020.

### 4.7.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.7.4 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25℃	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test: Immunity Conducted Currents S2b <700-0105-005>**

**Test Mode: Combi Device - Stereo**

**Monitor:**

**Speaker**

**Operating Mode: FM**

**S/N:**

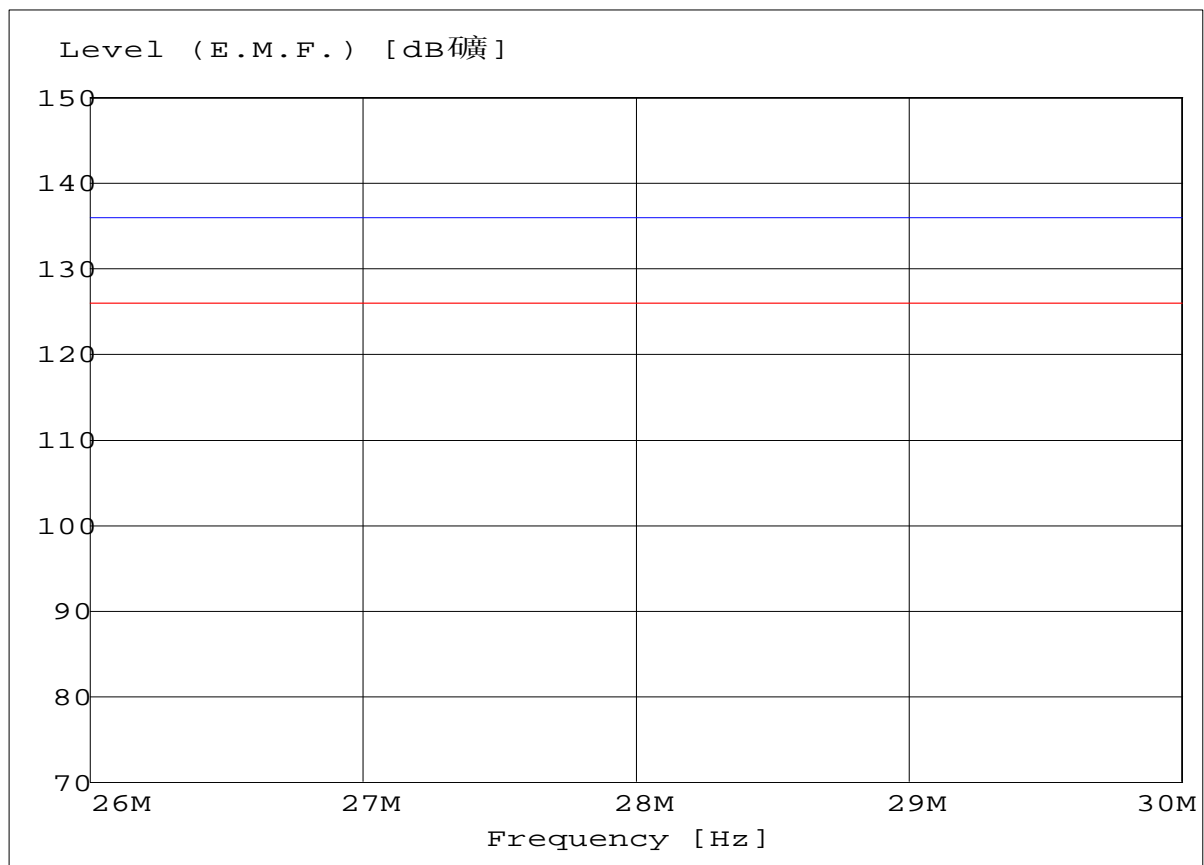
**48.9 dB**

**Frequency: 98.000000 MHz**

**AF Level:**

**49.5 mW**

**Interf. Signal: Antenna,**



## 4.8 IMMUNITY REQUIREMENTS FOR THE ENCLOSURE PORT (S3)

### 4.8.1 TEST LIMIT

Frequency MHz	Level dB( $\mu$ V/m)
0,15 to 150	125
Except frequency bands:	
$(f_i - 0,5)$ to $(f_i + 0,5)$	101
$(f_o - 0,5)$ to $(f_o + 0,5)$	109
$(f_{im} - 0,5)$ to $(f_{im} + 0,5)$	109
87,5 to 108 <sup>a</sup>	109
Except the tuned channel $\pm 0,15$	
<p>NOTE <math>f_i</math> is the intermediate frequency (= 10,7 MHz)</p> <p><math>f_o = f_t \pm f_i</math> is local oscillator frequency</p> <p><math>f_{im} = f_t \pm 2f_i</math> is the image frequency</p> <p><math>f_t</math> is the tuned frequency</p> <p>where</p> <p>sign "+" applies when <math>f_o &gt; f_t</math></p> <p>sign "-" applies when <math>f_o &lt; f_t</math></p>	
<p><sup>a</sup> The frequency range 87,5 MHz to 108 MHz can be varied depending on the use of the FM frequency band on a national basis.</p>	

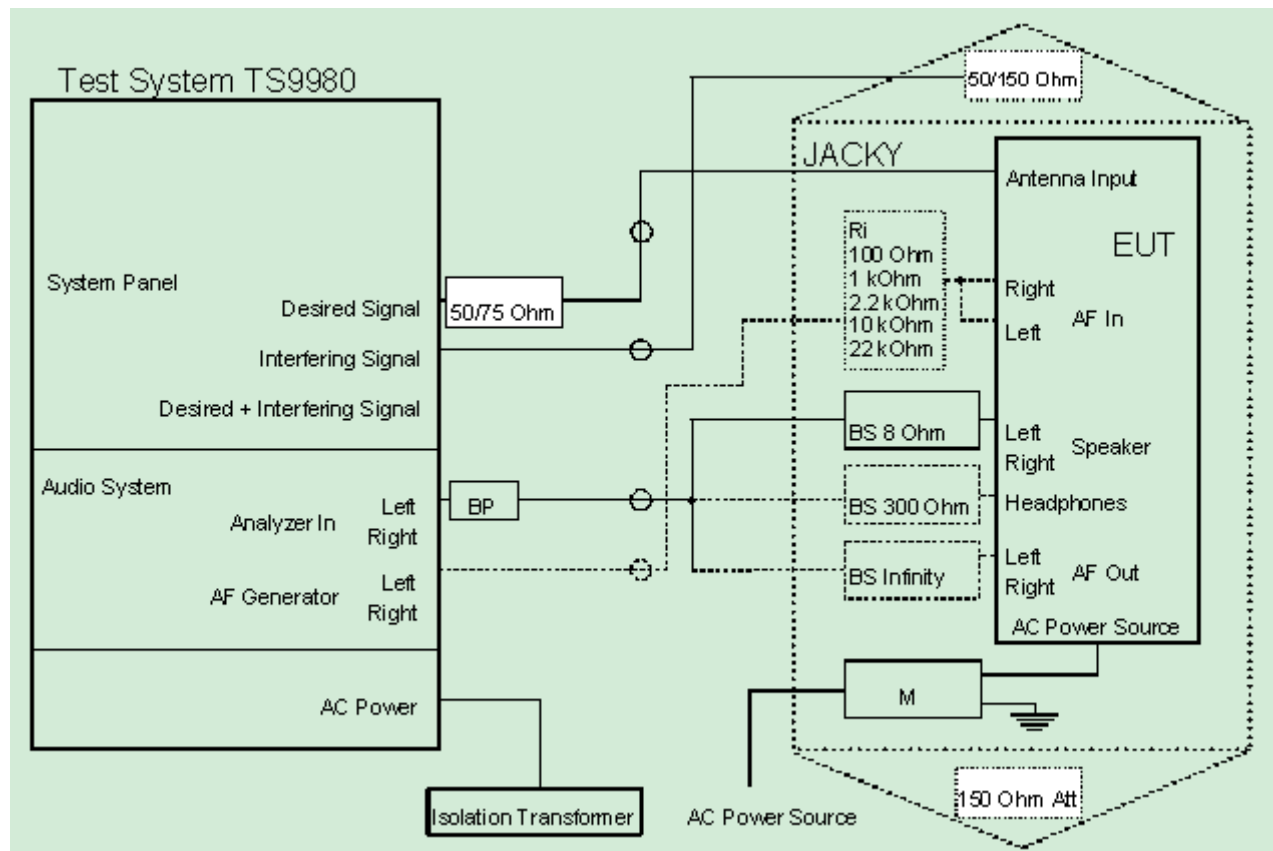
### 4.8.2 TEST PROCEDURE

Measurement was performed in shielded room.

Instruments used were following CISPR 16-1 and EN 55020.

Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.4 of EN55020.

### 4.8.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.8.4 TEST RESULTS

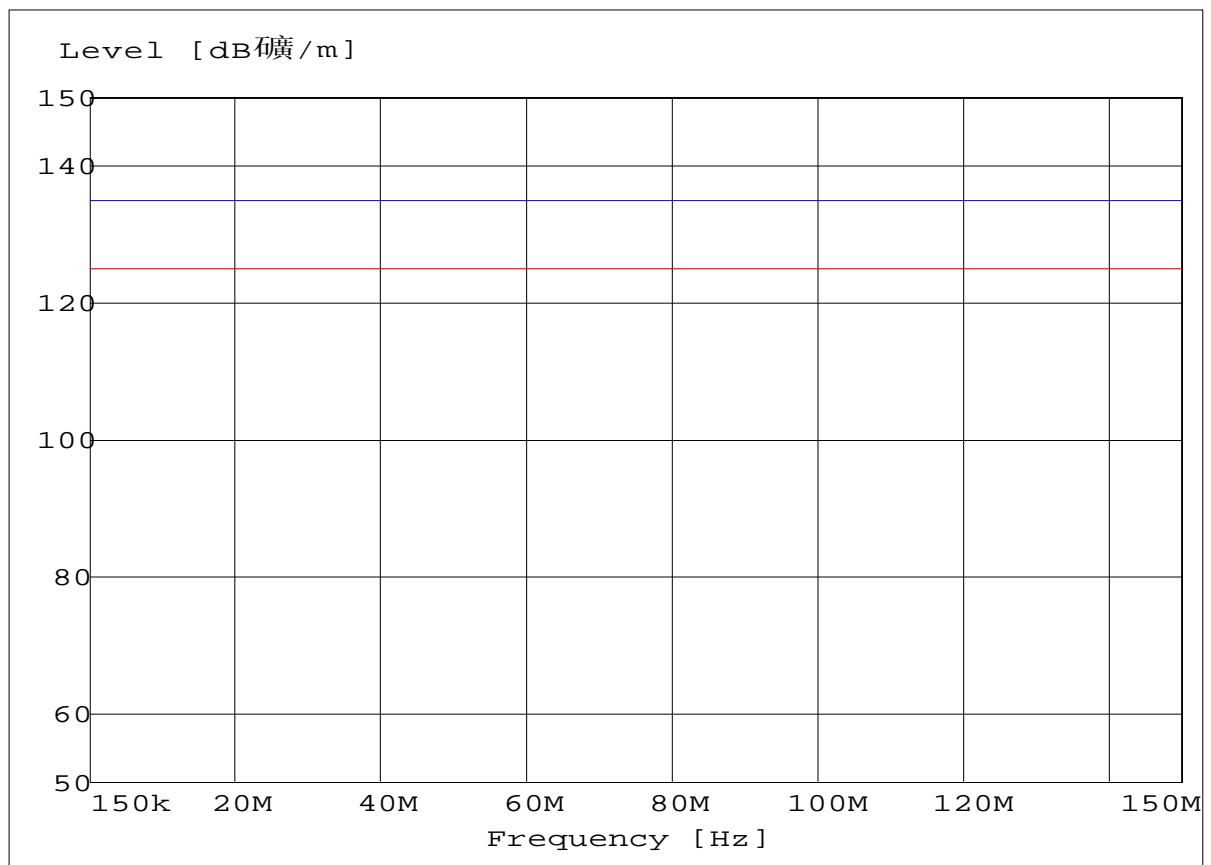
EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test:** Immunity Radiated Fields S3 <700-0105-005>

**Test Mode:** Combi Device -  
**Operating Mode:** iPod Play  
**Frequency:** -

**Monitor:** Speaker  
**S/N:** 72.5 dB  
**AF Level:** 76.3 mW

**Interf. Signal:** Scan, **K2 = 1.6 dB**





**Test:** Immunity Radiated Fields S3 <700-0105-005>

**Test Mode:** Combi Device -

**Operating Mode:** AUX

**Frequency:** -

**Monitor:**

**S/N:**

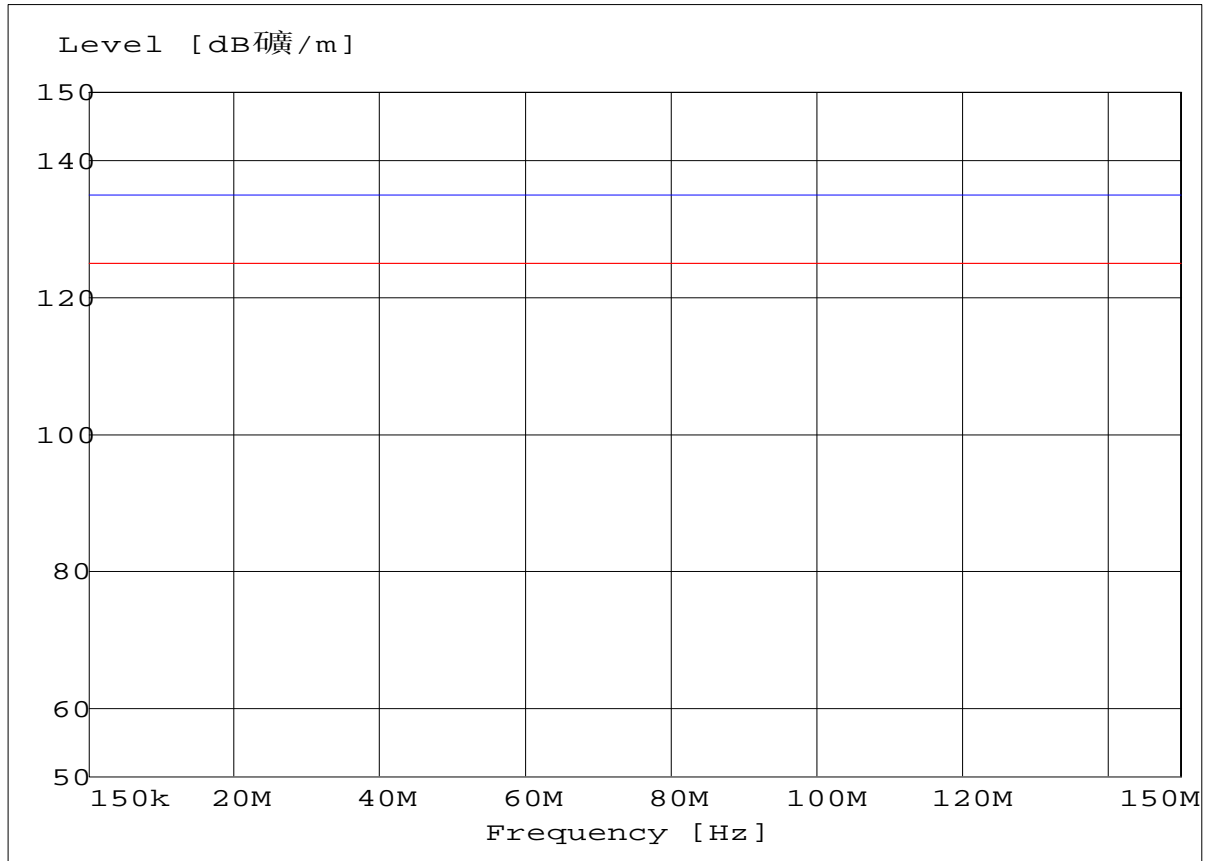
**AF Level:**

**Speaker**

**71.2 dB**

**74.6 mW**

**Interf. Signal:** Scan, **K2 = 1.6 dB**



**Test:** Immunity Radiated Fields S3 <700-0105-005>

**Test Mode:** Combi Device - Stereo

**Monitor:**

**Speaker**

**Operating Mode:** FM

**S/N:**

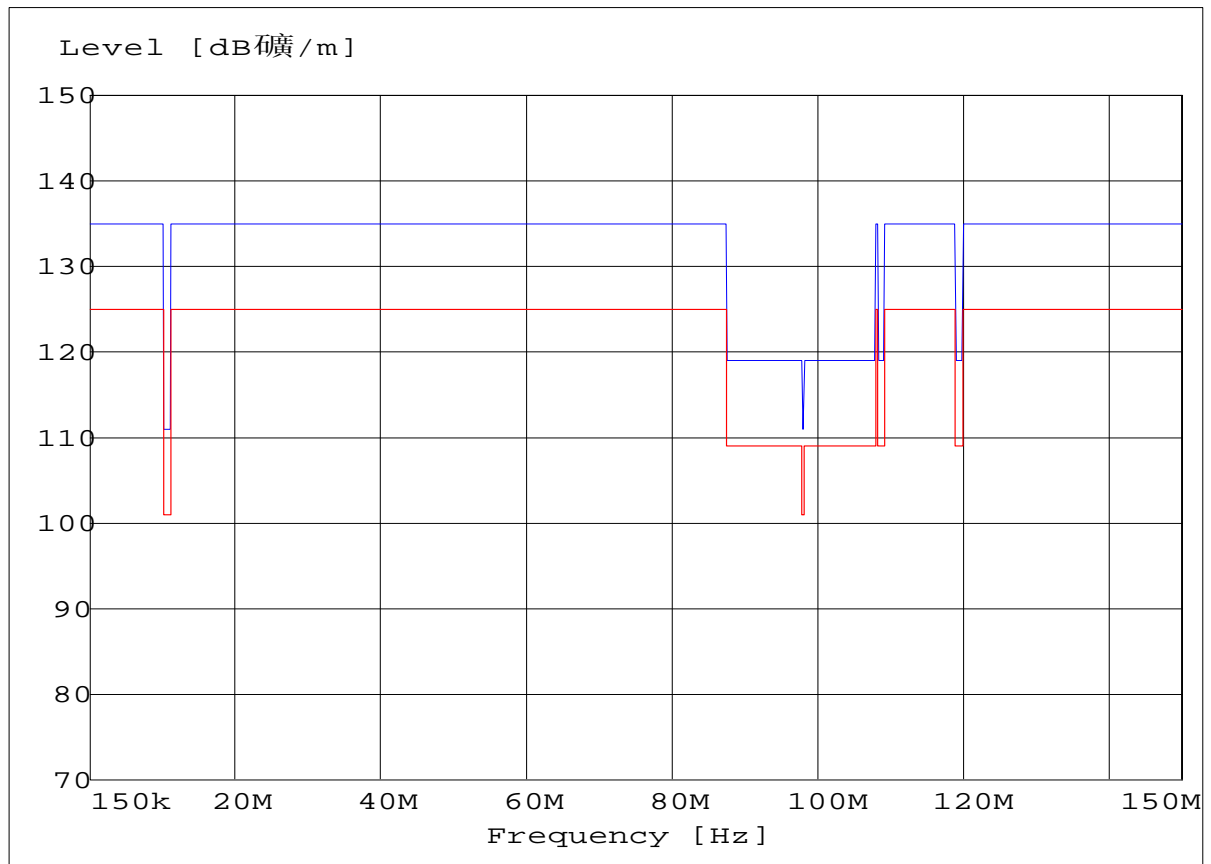
**65.6 dB**

**Frequency:** 98.000000 MHz

**AF Level:**

**45.2 mW**

**Interf. Signal:** Scan,



## 4.9 MEASUREMENT OF SCREENING EFFECTIVENESS (S4)

### 4.9.1 TEST LIMIT

Equipment	Signal frequency	Operating mode of the EUT	Level dB
FM radio antenna	Middle channel of each broadcast band the EUT is designed for.	Connected to the high-grade coaxial cable Ca as shown in Figure 7, but disconnected from the power supply.	≥20
TV antenna Digital radio antenna Digital TV antenna	Middle channel of each broadcast band the EUT is designed for.	Connected to the high-grade coaxial cable Ca as shown in Figure 7, but disconnected from the power supply.	≥50
<p>The requirements shall not apply to:</p> <ul style="list-style-type: none"> <li>– Loop-through UHF and IF terminals as well as RF modulator output terminals. Loop-through UHF- and IF terminals are terminated with a high-grade 75 Ω coaxial termination for the test.</li> <li>– Car radios.</li> <li>– Signal frequencies above 1 000 MHz.</li> </ul> <p>Measurements shall be made by using an average detector and the measuring receiver bandwidth shall lie within 8 kHz to 10 kHz.</p>			

### 4.9.2 TEST PROCEDURE

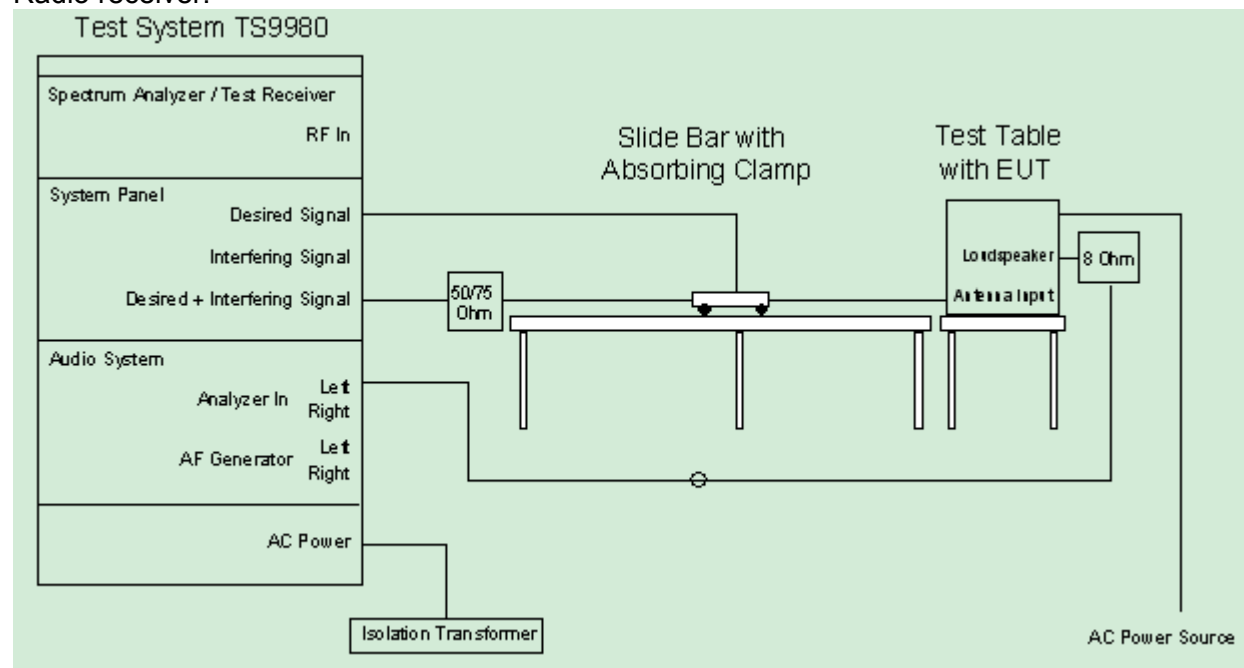
Measurement was performed in shielded room.

Instruments used were following CISPR 16-1 and EN 55020.

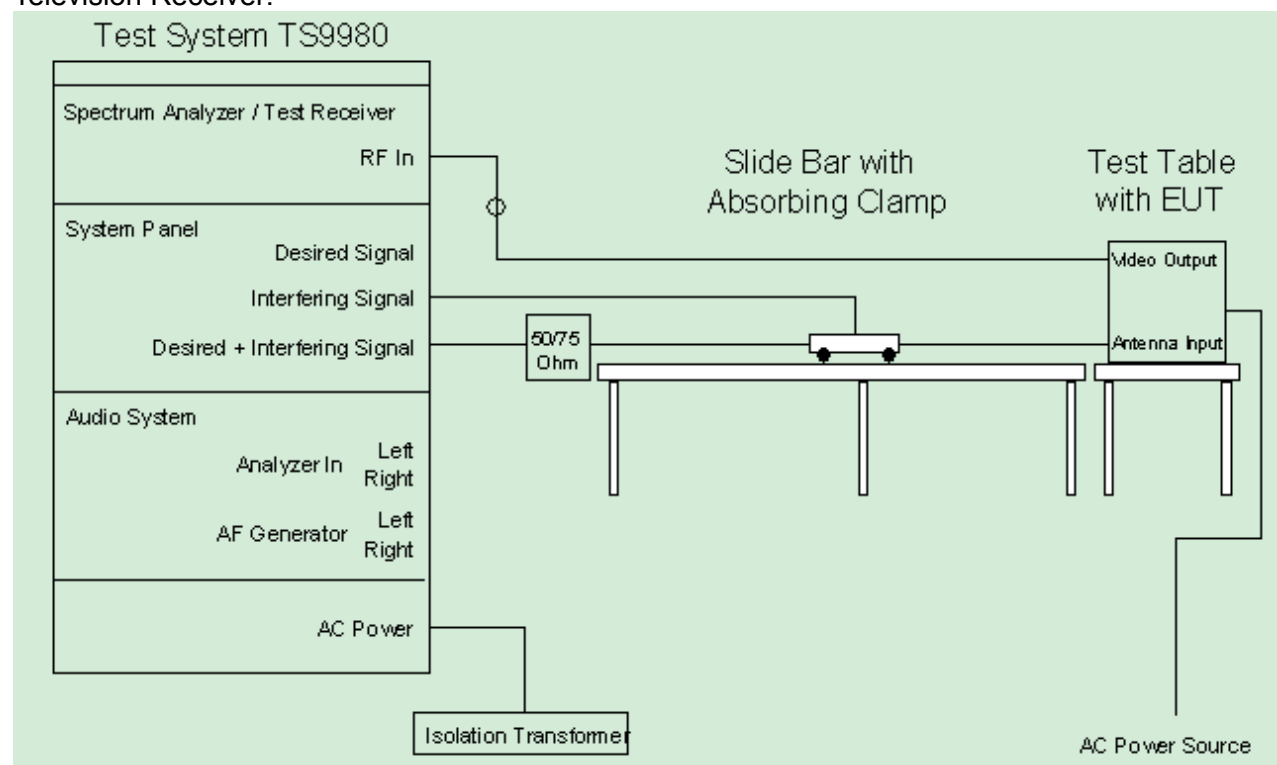
Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.4 of EN55020.

### 4.9.3 TEST SETUP

#### Radio receiver:



#### Television Receiver:



For the actual test configuration, please refer to the related Item –EUT Test Photos.

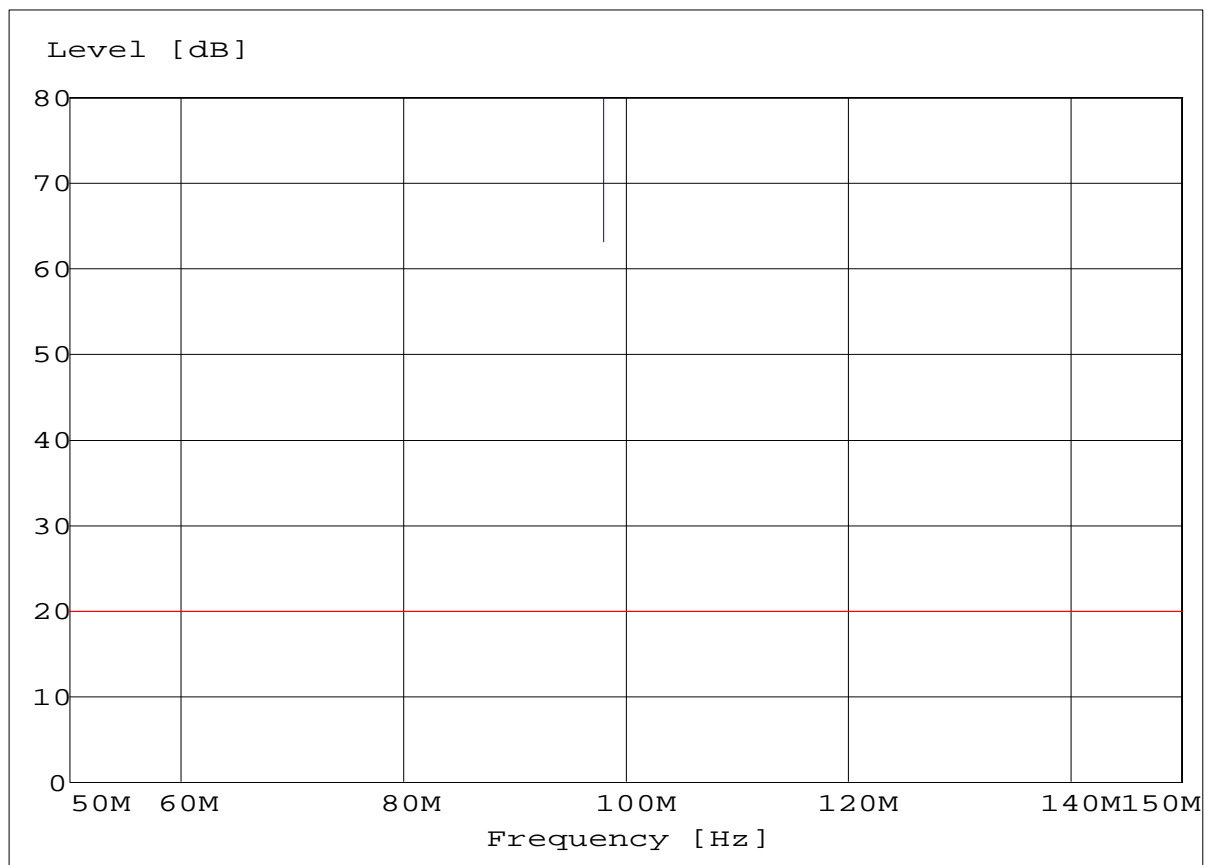
#### 4.9.4 TEST RESULTS

EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test: Screening Effectiveness S4 <700-0105-005>**

**Test Mode:** Combi Device  
**Operating Mode:** FM  
**Frequency:** 98.000000 MHz

**Interf. Signal: -,**



#### 4.10 IMMUNITY TO RF FIELD (KEYED CARRIER) (S5)

##### 4.10.1 TEST LIMIT

3V/m (Duty cycle 1/8, 217Hz repetition frequency)

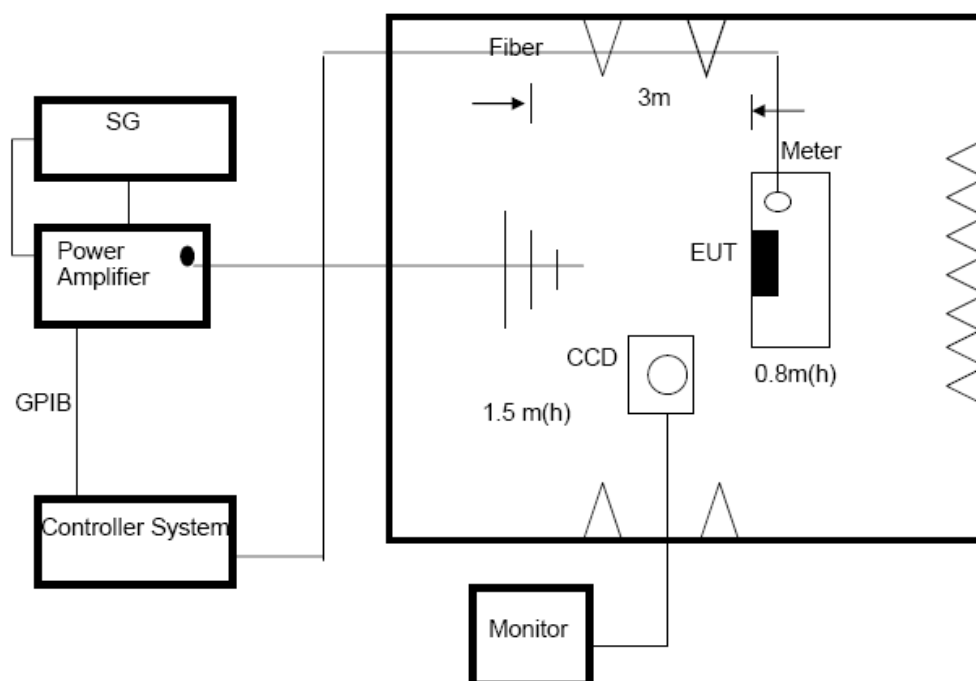
##### 4.10.2 TEST PROCEDURE

Measurement was performed in shielded room.

Instruments used were following CISPR 16-1 and EN 55020.

Measurement methods and operation conditions of EUT was according to clause 5.1, 5.2 and 5.4 of EN55020.

##### 4.10.3 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.10.4 TEST RESULTS

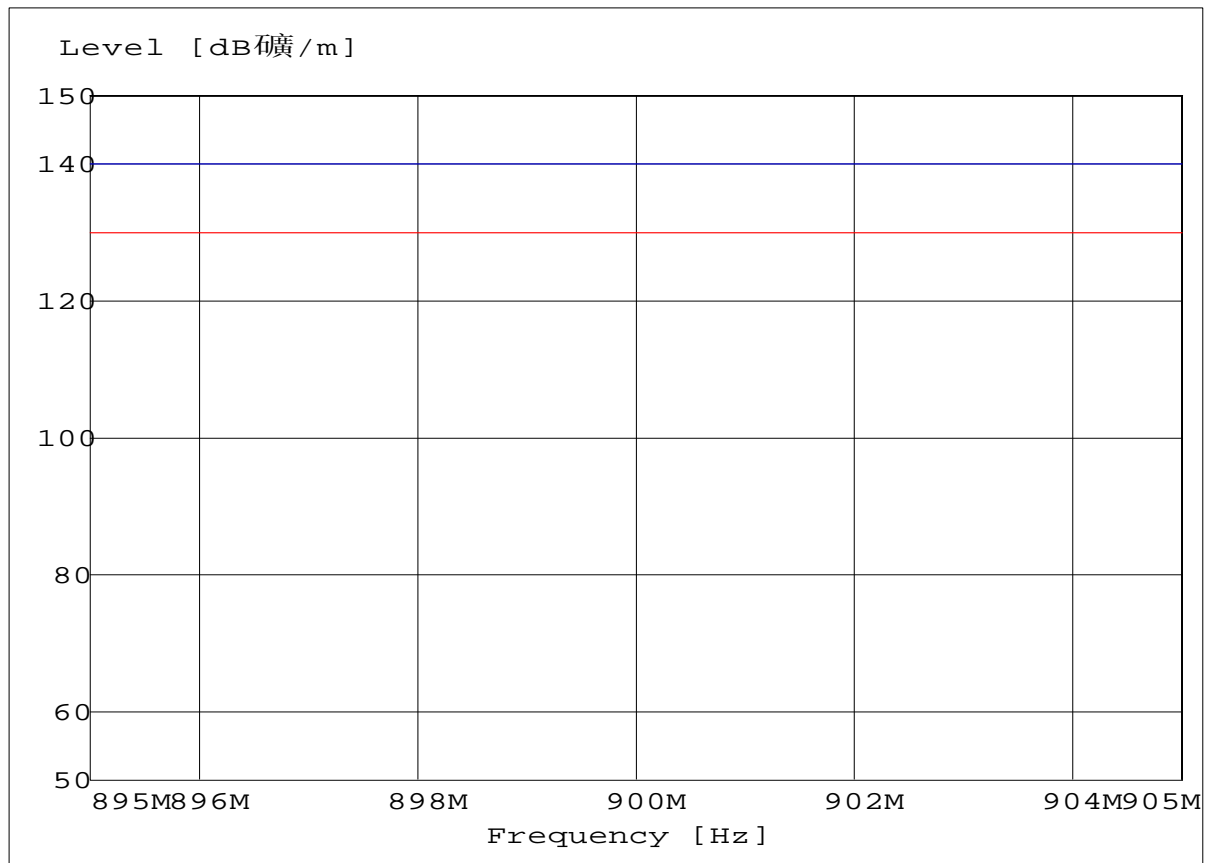
EUT :	5.1MULTIMEDIA SPEAKER	Model Name :	F6000U
Temperature :	25°C	Relative Humidity :	60%
Pressure :	1010 hPa	Test Date :	2014-03-11
Test Mode :	AUX		
Test Power :	AC 230V/50Hz		

**Test:**    *Keyed Carrier S5 <700-0105-005>*

**Test Mode:**        *Combi Device -*  
**Operating Mode:**    *iPod Play*  
**Frequency:**        *-*

**Monitor:**            *Speaker*  
**S/N:**                *65.3 dB*  
**AF Level:**         *75.1 mW*

**Interf. Signal:** *Scan,*

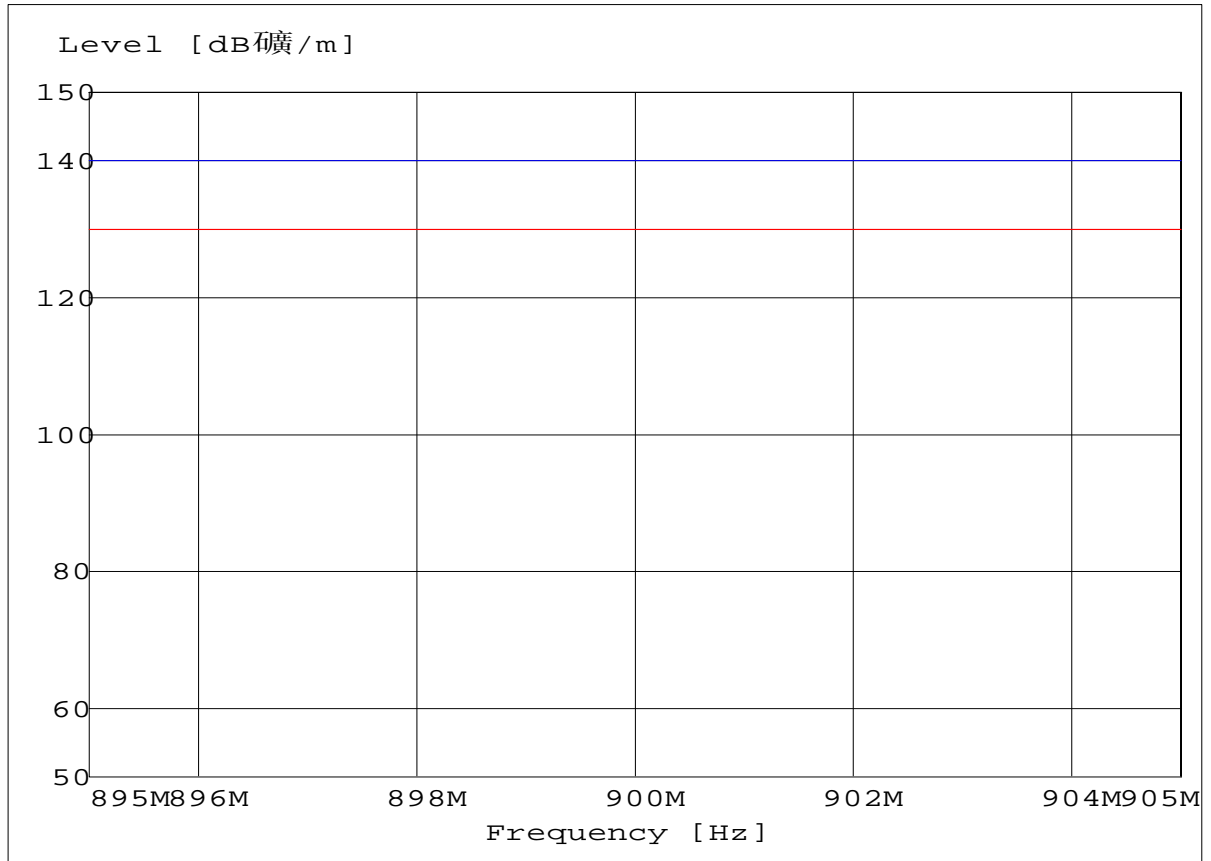


**Test:**    *Keyed Carrier S5 <700-0105-005>*

**Test Mode:**        *Combi Device -*  
**Operating Mode:**   *FM*  
**Frequency:**        *-*

**Monitor:**            *Speaker*  
**S/N:**                *65.0 dB*  
**AF Level:**         *78.3 mW*

**Interf. Signal:** *Scan,*



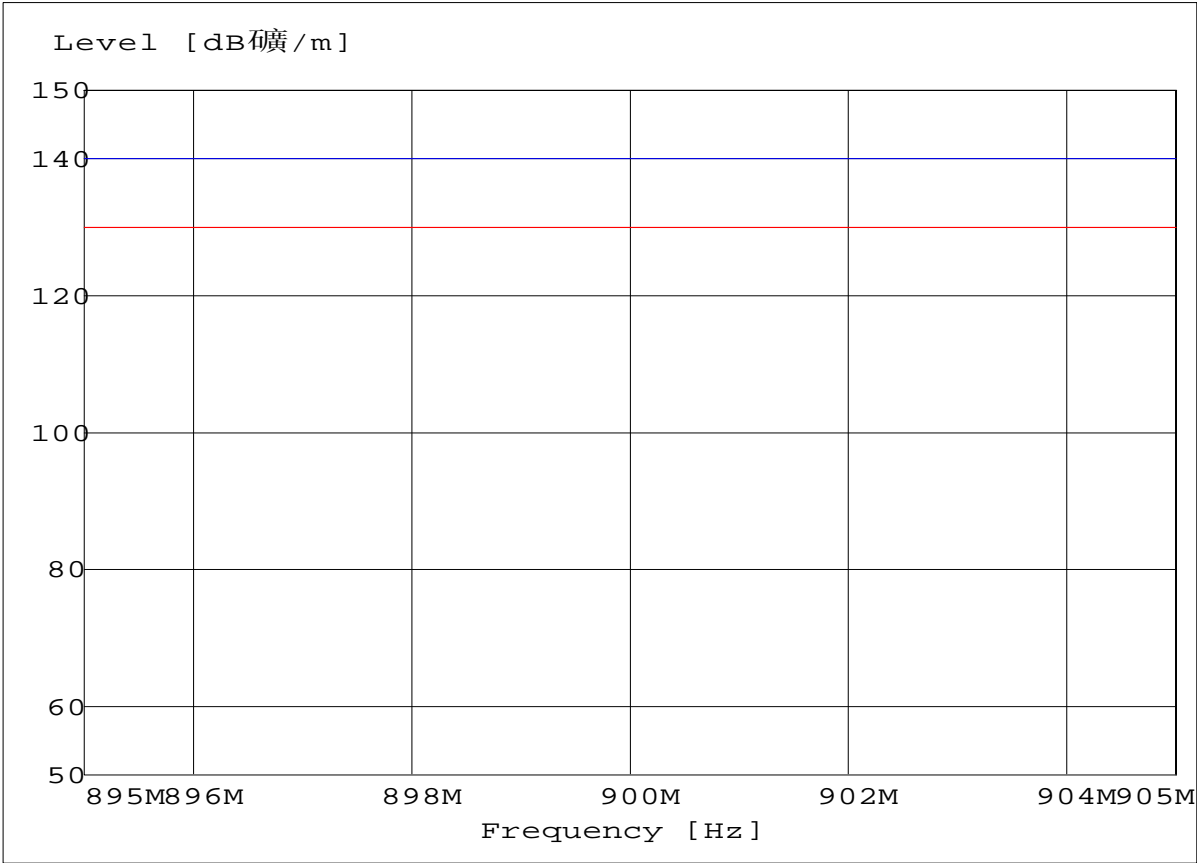


Test:    **Keyed Carrier S5 <700-0105-005>**

Test Mode:       **Combi Device -**  
Operating Mode:   **AUX**  
Frequency:        **-**

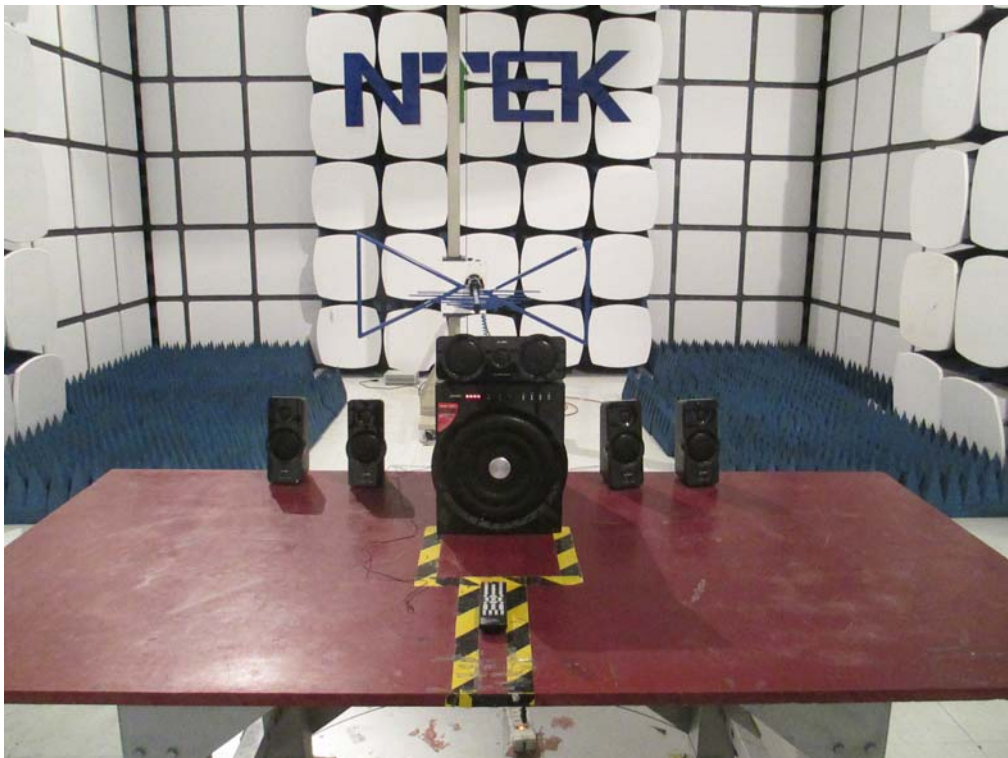
Monitor:         **Speaker**  
          **S/N:       65.2 dB**  
AF Level:        **72.2 mW**

Interf. Signal: **Scan,**



## 5. EUT TEST PHOTO

**Radiated Measurement Photos**



### Conducted Measurement Photos



## ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



Photo 2





Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

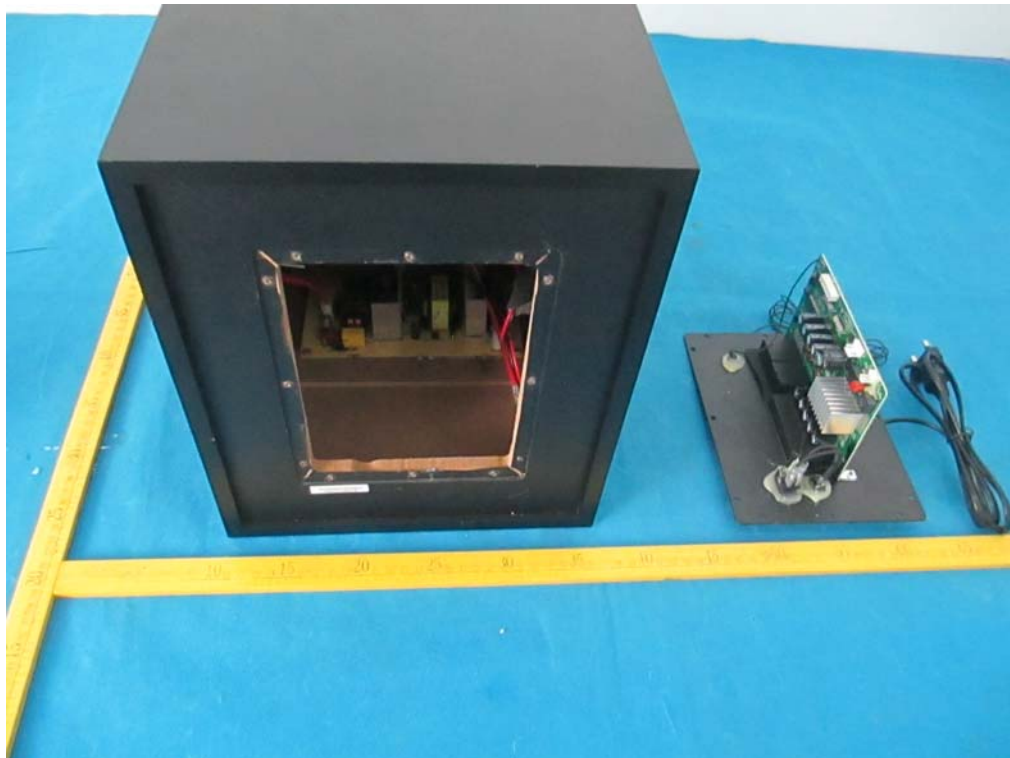


Photo 8





Photo 9

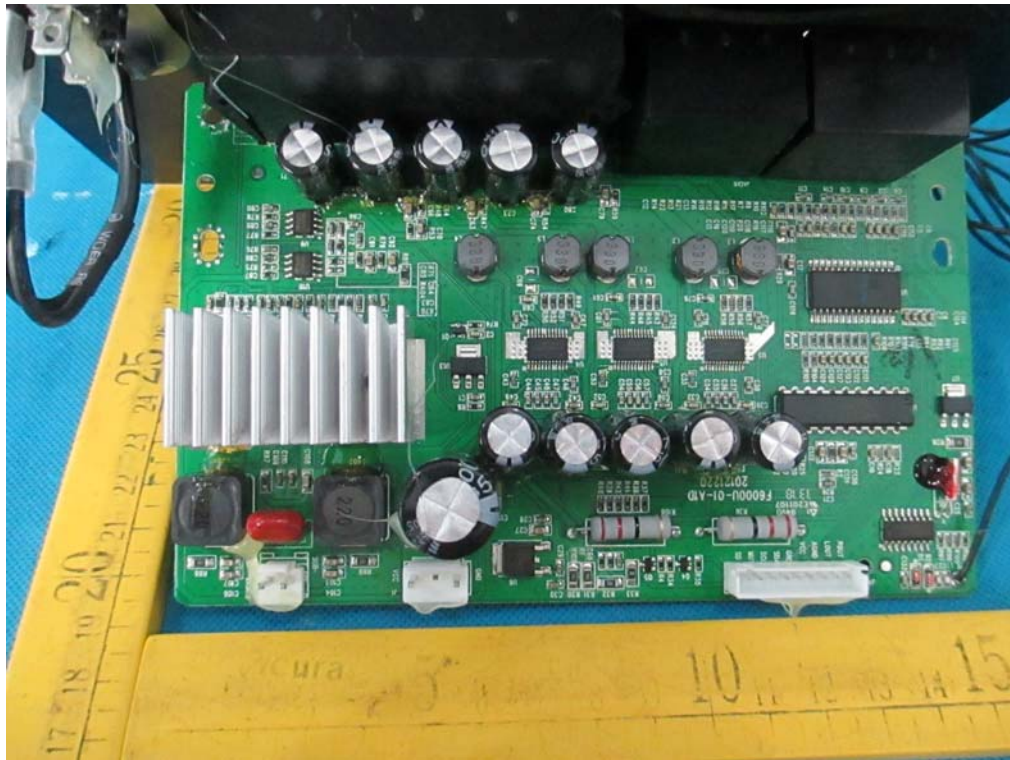


Photo 10

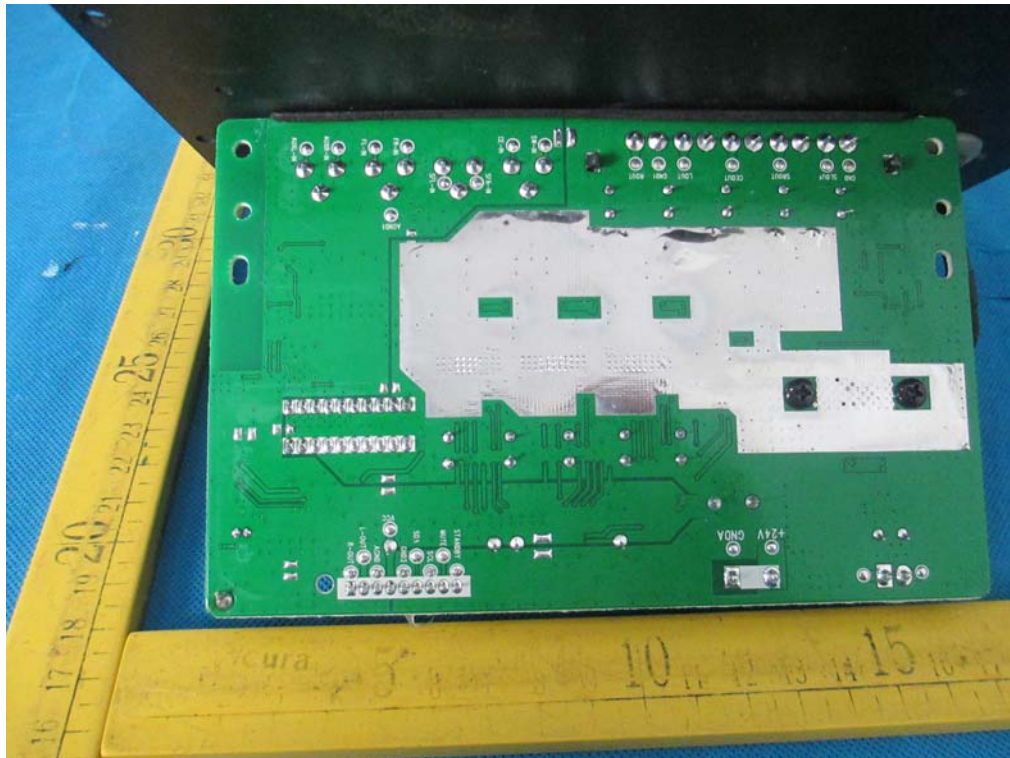




Photo 11



Photo 12

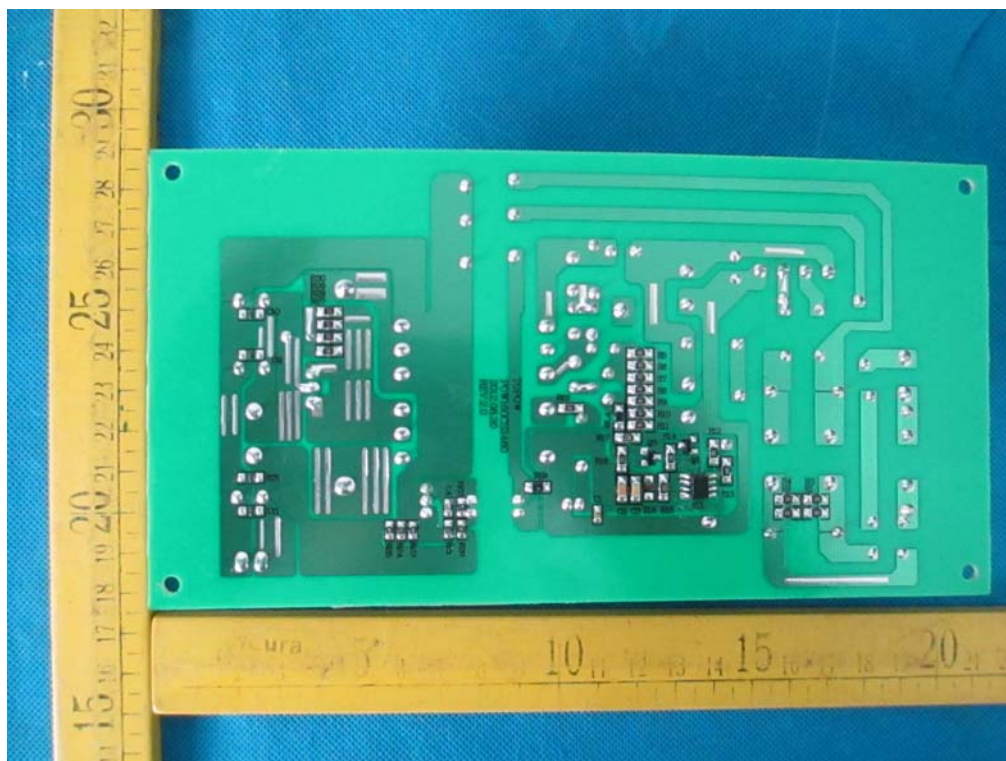


Photo 13

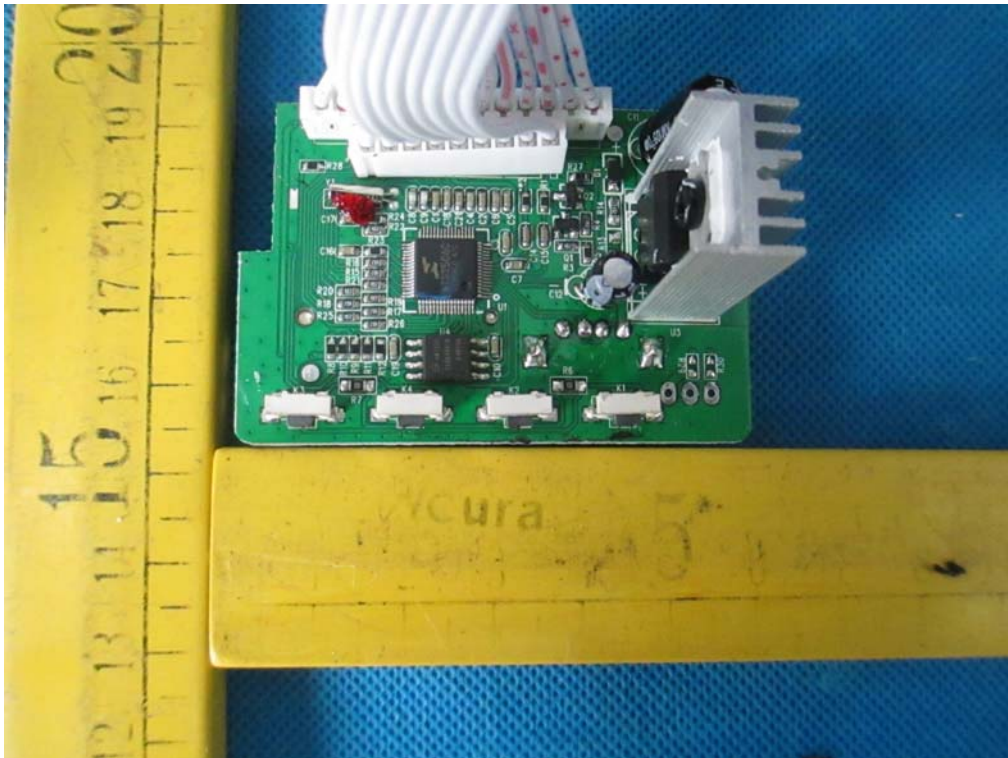


Photo 14

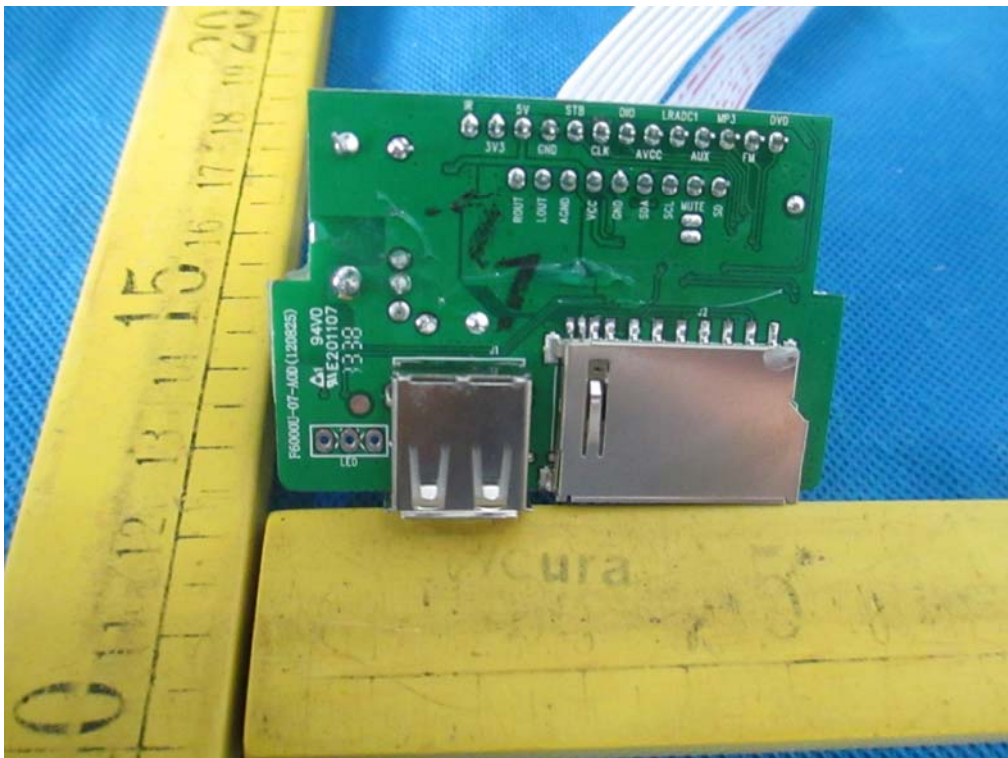




Photo 15



Photo 16



Photo 17

