FCC Radio TEST Report

FCC ID: NZT-AT23G

This report concerns (check one) : ■ **Original Grant** □ **Class I Change**

Issued Date	:	Mar. 31, 2008
Project No.	:	0801C076
Equipment	:	iPod docking with wireless transmitter
Model Name	:	AT23G
Applicant	:	Artchief Industries Ltd.
Address	:	Unit B,16/F China best International Centre, No.8 Kwai On Road,Kwai Chung N.T.,HongKong

Tested by:

Neutron Engineering Inc. EMC Laboratory

Date of Test:

Jan. 16, 2008 ~ Mar. 27, 2008

Testing Engineer : Tendy Huang (Tendy Huang)

Technical Manager : Steven Lu (Steven Lu)

Authorized Signatory : Steven Lu for (Vic Chiu)

NEUTRON ENGINEERING INC.

B1,No.37,Lane 365,YangGuang St.,NeiHu District 114.,Taipei,Taiwan

TEL : (02) 2657-3299 FAX : (02) 2657-3331

NVLAP Lab Code: 200145-0 ilac-MRA TAF Testing Laboratory 0659

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 **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

Neutron's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **Neutron-self**, extracts from the test report shall not be reproduced except in full with **Neutron**'s authorized written approval.

Neutron's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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**

1. CERTIFICATION

Equipment : iPod docking with wireless transmitter
Trade Name : ADDICON
Model Name : AT23G
Applicant : Artchief Industries Ltd.
Date of Test : Jan. 16, 2008 ~ Mar. 27, 2008
Test Item : ENGINEERING SAMPLE
Standards : FCC Part15, Subpart C(15.235) / ANCI C63.4 : 2003

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-FCCP-1-0801C076) 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:

FCC Part15, Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.235 15.209	Radiated Spurious Emission	PASS	
15.235(b)	Band Edge Measurement Test	PASS	

NOTE:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **C01/OS02** at the location of B1,No.37,Lane 365,YangGuang St.,NeiHu District 114.,Taipei,Taiwan.
Neurtron's test firm number is: 95335.

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **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
C01	ANSI	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
OS-02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	iPod docking with wireless transmitter
Trade Name	ADDICON
Model Name	AT23G
OEM Brand/Model No.	N/A
Model Difference	N/A
Product Description	The EUT is a iPod docking with wireless transmitter. Product Type: Low Power Communication Device Operation Frequency: 49.86 MHz Modulation Type: FM Number Of Channel: 1 CH Output Power: 77.43 dBuv/m (AV Max.) 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.
Channel List	Please refer to the Note 2.
Power Source	DC Voltage supplied from AC/DC Adapter Brand name: Ktec Model name: KA12D120035034U
Power Rating	I/P:120V/60Hz 95mA O/P:12Vdc 350mA
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.

Freqeuncy Band	Channel No.	Frequency
49.82~49.90MHz	1	49.86 MHz

3. Table for Filed Antenna

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

3.2 DESCRIPTION OF TEST MODES

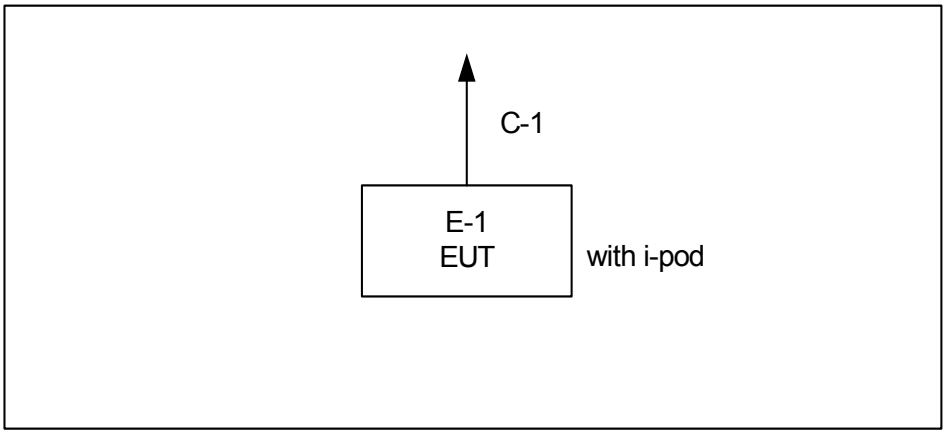
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

Pretest Mode	Description
Mode 1	TX CH 01- 49.86MHz with i-Pod
Mode 2	Normal Link to Receive sample

For Conducted Test	
Final Test Mode	Description
Mode 2	Normal Link to Receive sample

For Radiated Test	
Final Test Mode	Description
Mode 1	TX CH 01- 49.86MHz with i-Pod

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 DC power line

3.4 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	Series No.	Note
E-1	iPod docking with wireless transmitter	ADDICON	AT23G	NZT-AT23G	N/A	EUT
E-2	i-Pod	APPLE	A1199	DOC	YM7344HGVQ5	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.8M	

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.

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00042991	Jan. 24, 2009
2	LISN	EMCO	3816/2	00042990	Jan. 24, 2009
3	Pulse Limiter	Electro-Metrics	EM-7600	112644	Nov. 27, 2008
4	50Ω Terminator	N/A	N/A	N/A	May.13, 2009
5	Test Cable	N/A	C01	N/A	Nov. 27, 2008
6	EMI Test Receiver	R&S	ESCI	100082	Mar. 07, 2009

Remark: ” N/A” denotes No Model Name , 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

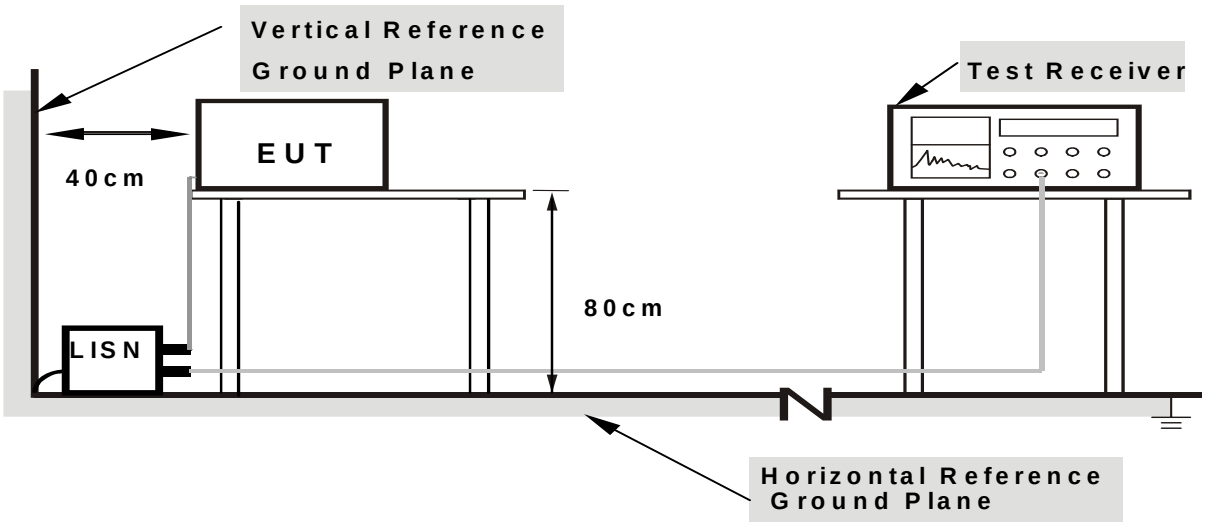
4.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 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 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.

Set the EUT under transmission condition continuously at specific channel frequency.
Note: the device was at maximum level on iPod and the audio input signal was from iPod.

4.1.7 TEST RESULTS

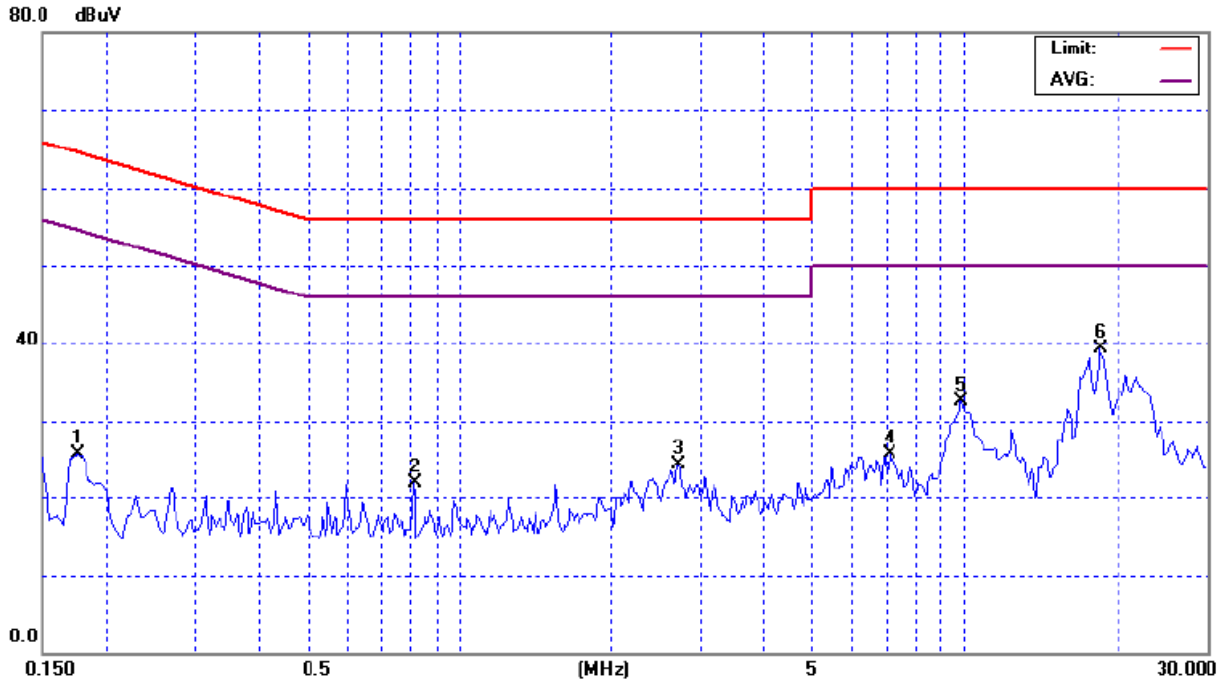
EUT：	iPod docking with wireless transmitter	Model Name ：	AT23G
Temperature：	26 ℃	Relative Humidity：	60 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Normal Link to Receive sample		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Line	25.61	*	64.72	54.72	-39.11	(QP)
0.82	Line	21.94	*	56.00	46.00	-34.06	(QP)
2.72	Line	24.36	*	56.00	46.00	-31.64	(QP)
7.11	Line	25.66	*	60.00	50.00	-34.34	(QP)
9.86	Line	32.46	*	60.00	50.00	-27.54	(QP)
18.55	Line	39.21	*	60.00	50.00	-20.79	(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。



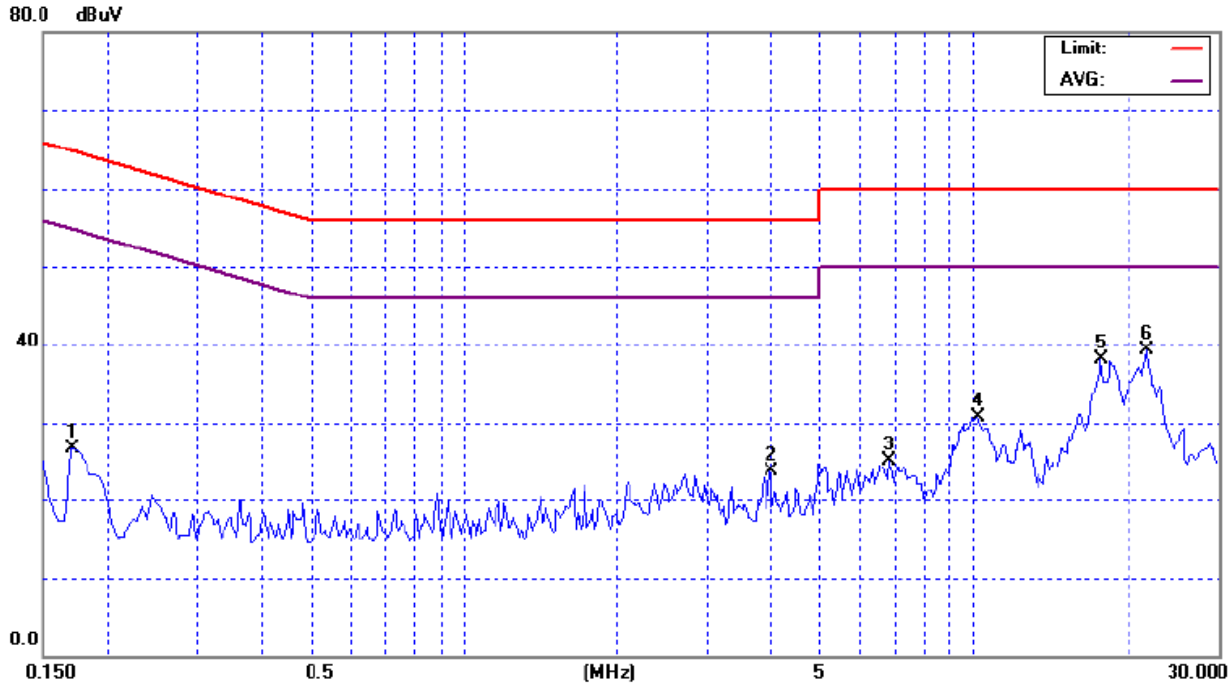
EUT：	iPod docking with wireless transmitter	Model Name ：	AT23G
Temperature：	26 ℃	Relative Humidity：	60 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	Normal Link to Receive sample		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	Neutral	26.75	*	64.96	54.96	-38.21	(QP)
3.99	Neutral	23.61	*	56.00	46.00	-32.39	(QP)
6.83	Neutral	25.05	*	60.00	50.00	-34.95	(QP)
10.15	Neutral	30.77	*	60.00	50.00	-29.23	(QP)
17.77	Neutral	38.06	*	60.00	50.00	-21.94	(QP)
21.88	Neutral	39.32	*	60.00	50.00	-20.68	(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(FCC 15.235)

According to 15.235 the field strength of emissions from intentional radiatorsoperated under these frequencies bands shall not exceed the following:

Fundamental Frequency(MHz)	Field Strength of Fundamental (dBuV/m)	
	Peak	Average
49.82 - 49.90	100	80

According to 15.235 (b) the field strength of and emissions appearing between theband edges and up to 10kHz above and below the band edges shall beattenuated at least 26dB below the level of the unmodulated carrier or to thegeneral limits in 15.209, whichever permits the higher emission levels.

The field strength of and emissions removed by more than 10kHz from the bandedges shall not exceed the general radiated emission limits in 15.209. as following:

Other Frequencies(MHz)	Field Strength of Fundamental	
	uV/meter	dBuV/meter
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	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits arebased on average detector, however, the peak field strength of any emission shallnot exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3058	Nov. 27, 2008
2	Test Cable	N/A	10M_OS02	N/A	Nov. 27, 2008
3	Test Cable	N/A	OS02-1/-2/-3	N/A	Nov. 27, 2008
4	Pre-Amplifier	Anritsu	MH648A	M09961	Nov. 27, 2008
5	EMI Test Receiver	R&S	ESCI	100082	Jan. 31, 2008
6	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A
7	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
8	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009
9	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-325	Oct. 24, 2008
10	Horn Antenna	Schwarzbeck	BBHA9170	9170187	Oct. 24, 2008
11	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Mar. 09, 2009
12	Microflex Cable	United Microwave	57793	1m	Mar. 09, 2009
13	Microflex Cable	United Microwave	A30A30-5006	10M	Jul. 07, 2008

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

4.2.3 TEST PROCEDURE

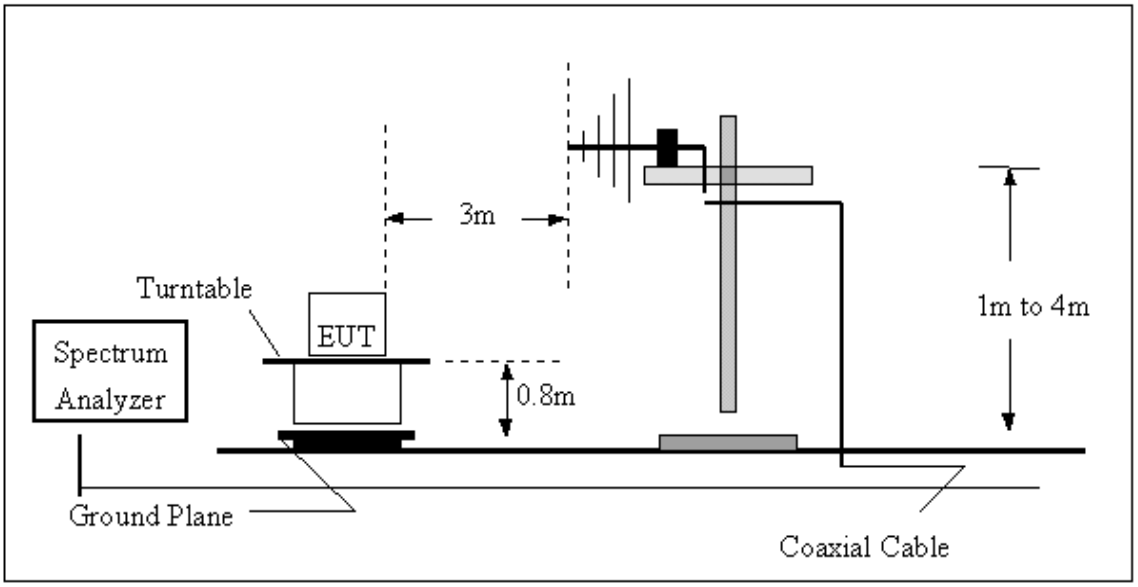
a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 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.
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

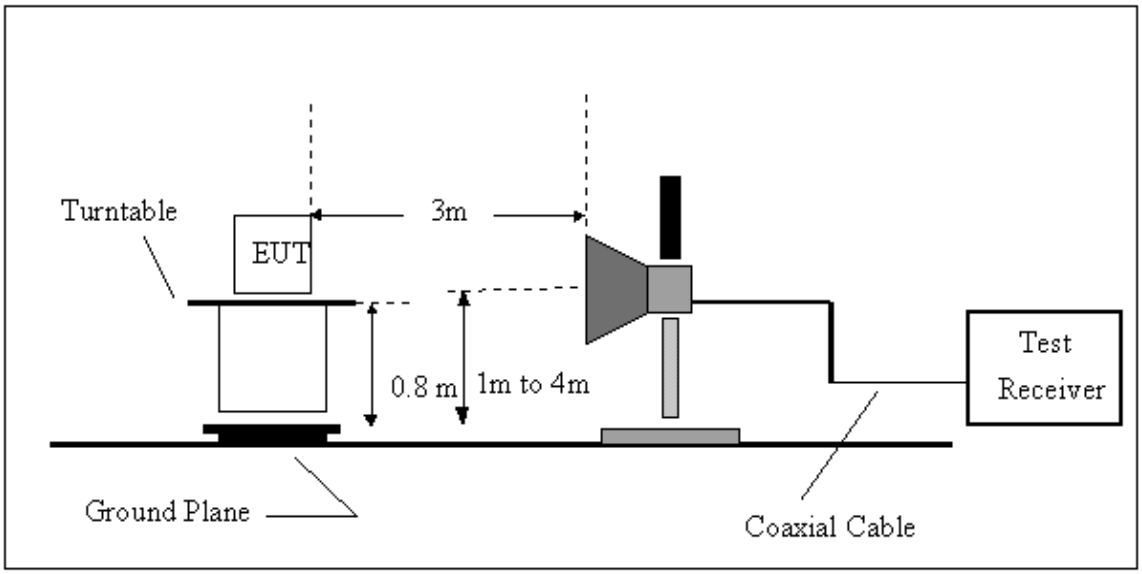
No deviation

4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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



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 (Between 30 – 1000 MHz)

EUT：	iPod docking with wireless transmitter	Model Name ：	AT23G
Temperature：	26 ℃	Relative Humidity：	60 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH 01- 49.86MHz with i-Pod		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
49.86	V	67.72	9.76	77.48	100.00	- 22.52	F/(PK)
49.86	V	67.67	9.76	77.43	80.00	- 2.57	F/(AV)
99.73	V	52.12	-20.67	31.45	43.50	- 12.05	(QP)
149.58	V	49.56	-20.51	29.05	43.50	- 14.45	(QP)

Remark：

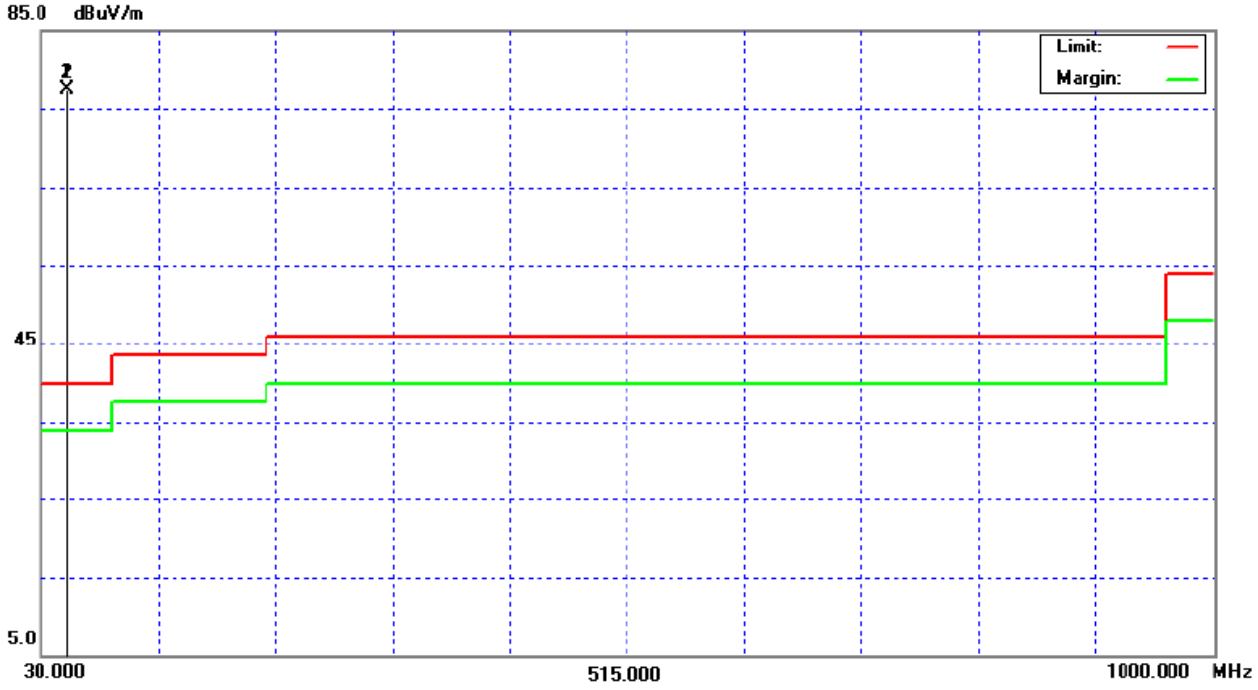
(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

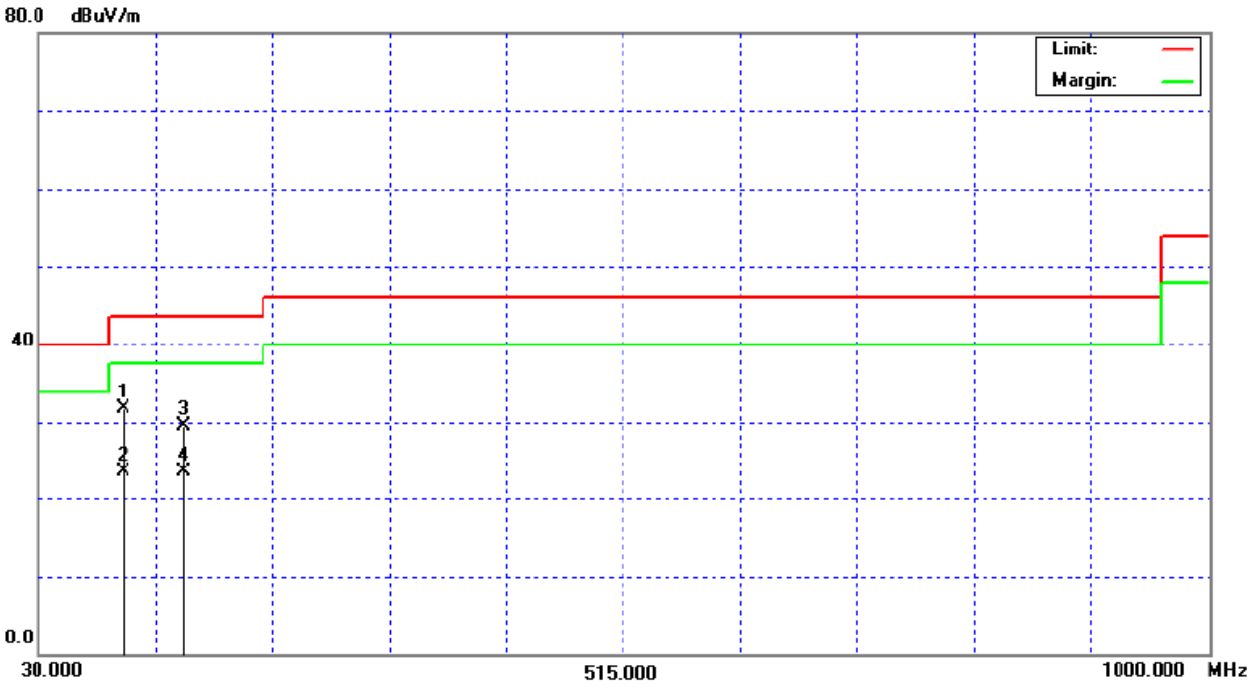
(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP 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.

TX CH01 (30-1000 MHz, Vertical)





EUT：	iPod docking with wireless transmitter	Model Name ：	AT23G
Temperature：	25 ℃	Relative Humidity：	60 %
Pressure：	1010 hPa	Test Power ：	AC 120V/60Hz
Test Mode ：	TX CH 01- 49.86MHz with i-Pod		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
49.86	H	60.10	9.76	69.86	100.00	- 30.14	F/(PK)
49.86	H	59.56	9.76	69.32	80.00	- 10.68	F/(AV)
99.73	H	52.47	-20.67	31.80	43.50	- 11.70	(QP)
149.57	H	51.56	-20.51	31.05	43.50	- 12.45	(QP)

Remark：

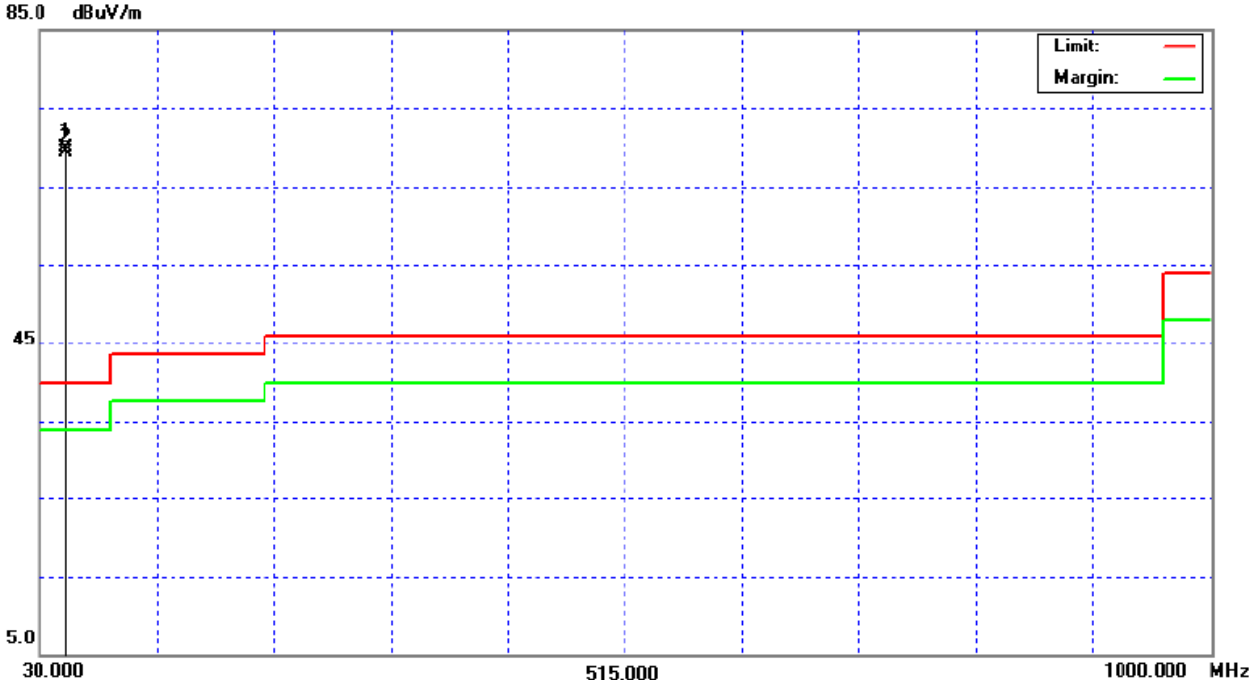
(1) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。

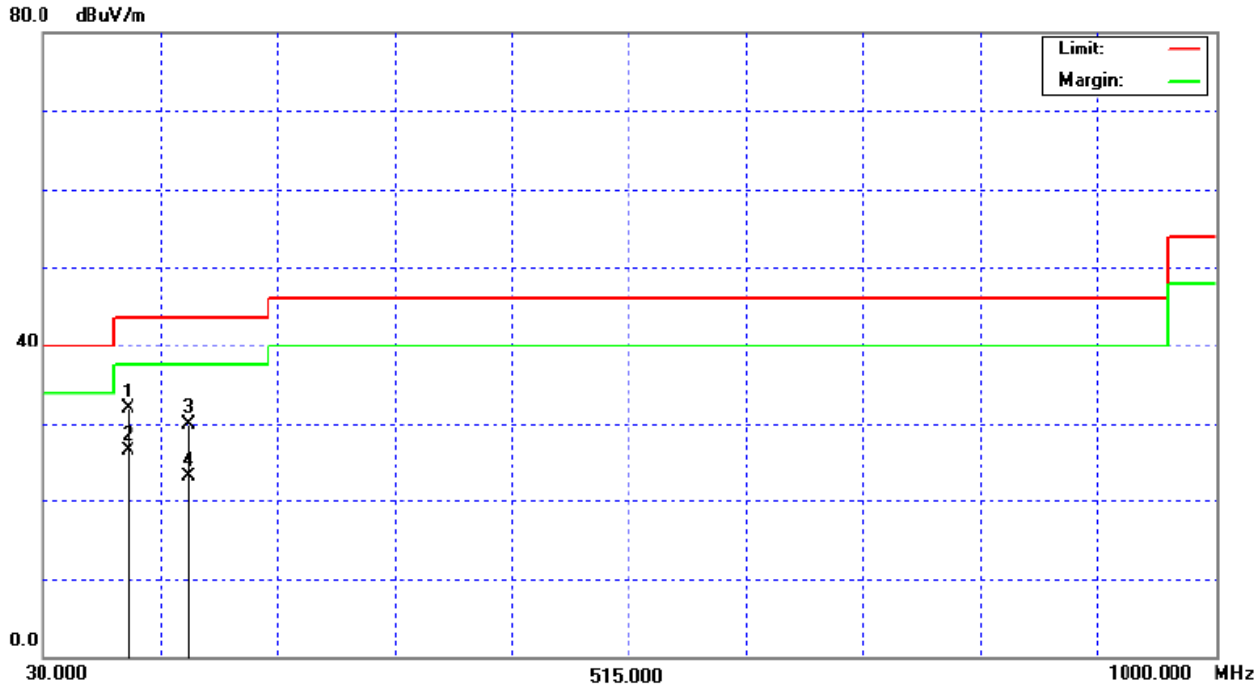
(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency。"F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.

(3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP 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.

TX CH01 (Above 1000 MHz, Horizontal)





4.3. BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

The field strength of any emissions appearing between the band edges and up to10kHz above and below the band edges shall be attenuated at least 26dB belowthe level of the unmodulated carrier or to the general limits in 15.209, whicheverpermits the higher emissions levels.

4.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable.Set both RBW and VBW of spectrum analyzer to 1kHz with suitable frequency spanincluding 10kHz bandwidth from band edge. The band edges was measured andrecorded.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

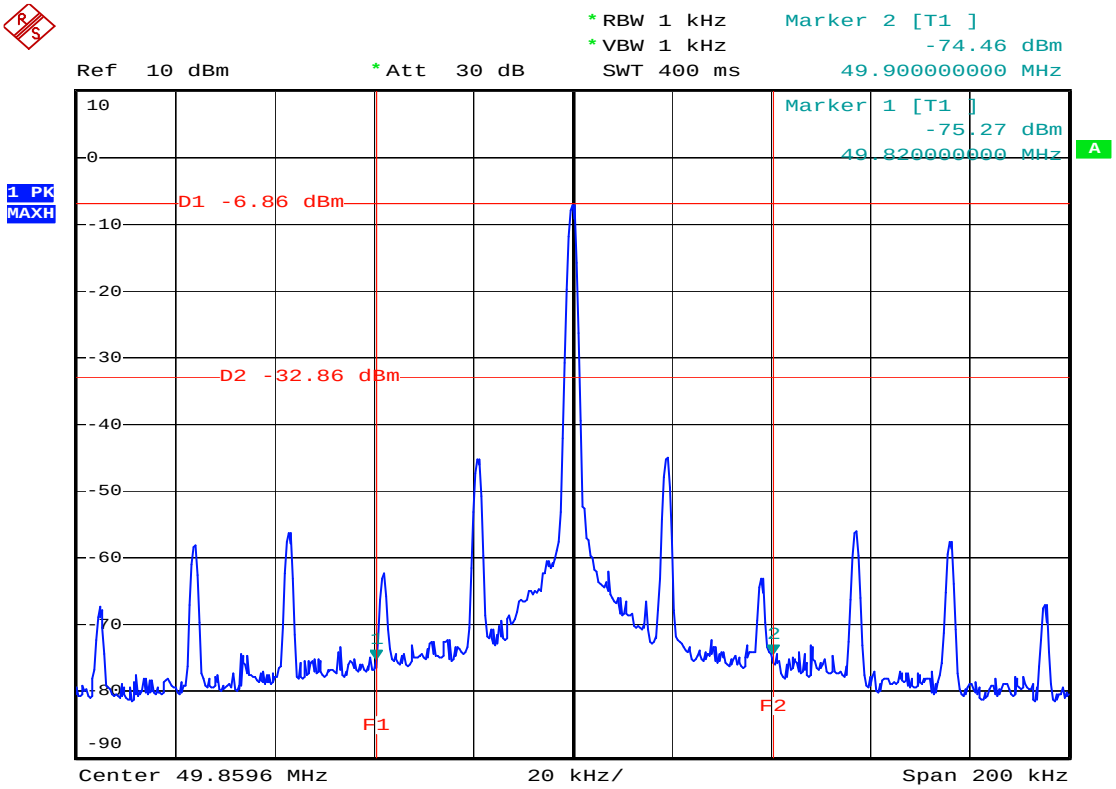
4.3.5 EUT OPERATING CONDITION

Same as Item 4.2.5

4.3.6 TEST RESULTS

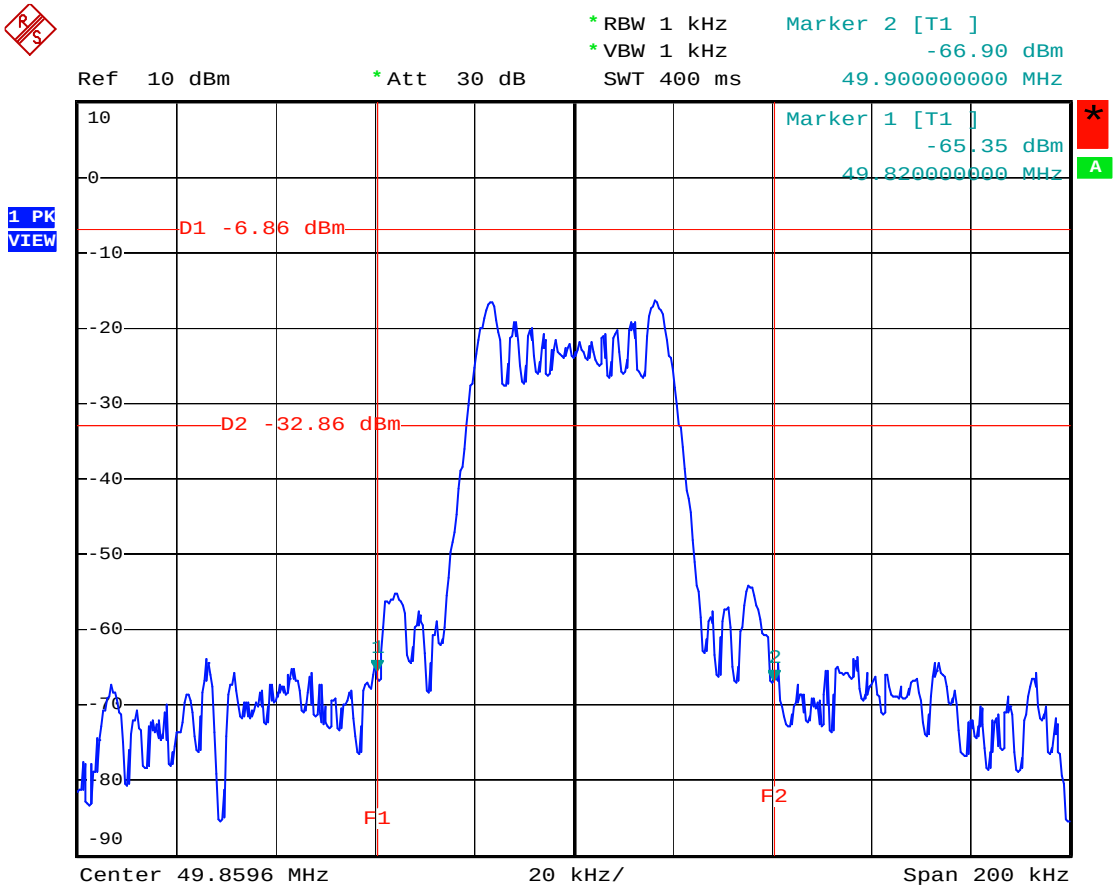
The spectrum plots are attached on the following pages. D2 line indicates the highestlevel, D1 line indicates the 26dB offset below D2. It shows compliance with therequirement in part 15.235(C).

TX -49.86MHz EUT -Unmodulated carrier



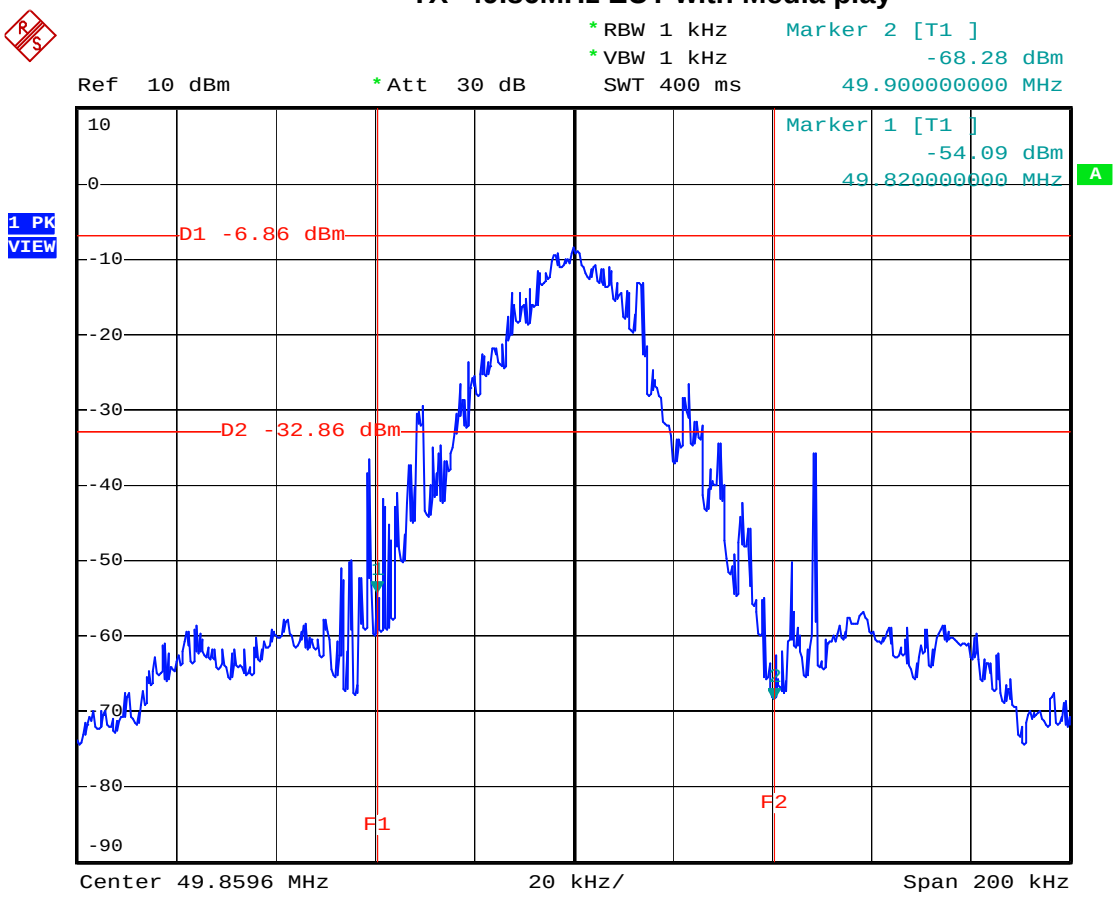
Date: 17.MAR.2008 08:10:38

TX -49.86MHz EUT -1KHz tone



Date: 17.MAR.2008 08:11:45

TX -49.86MHz EUT with Media play



Date: 17.MAR.2008 08:14:52

5. EUT TEST PHOTO

Conducted Measurement Photos
Normal Link

Radiated Measurement Photos
TX sample