

FCC Test Report

E.U.T. : Amplifier Speaker
Trade Name : Monitor Audio
Model Number : i-deck
FCC ID : TAQMA945311
Report Number : RF-A25-0505-023
Date of Report : May 24, 2005

Prepared for

Monitor Audio Ltd.

24 Brook Road, Rayleigh Essex SS6 7XL U.K.

Prepared by



Central Research Technology Co.

EMC Test Laboratory

No.11, Lane41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.



NVLAP LAB CODE 200575-0

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Total : 26 Pages

Certification of Compliance

E.U.T. : Amplifier Speaker
Model No. : i-deck
FCC ID : TAQMA945311
Manufacturer : JAZZ HIPSTER CORPORATION
Applicant : Monitor Audio Ltd.
Address : 24 Brook Road, Rayleigh Essex SS6 7XL U.K.
Applicable Standards : 47 CFR part 15, Subpart C
Sample of Receipt : May 20, 2005
Date of Testing : May 23, 2005
Deviation : N/A
Condition of Test Sample : Prototype



We, **Central Research Technology Co.**, hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , DATE : May 24, 2005
(Cathy Chen/RF Engineer)
CHECKED BY : Sam Chien , DATE : May 24, 2005
(Sam Chien/Technical Manager)
APPROVED BY : J. Y. Shih , DATE : May 24, 2005
(Tsun-Yu Shih/Laboratory Head)

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Attachment 1 – Photographs of the Test Configurations

Attachment 2 – External Photographs of EUT

Attachment 3 – Internal Photographs of EUT

1. General Description

1.1 General Description of EUT

E.U.T. : Amplifier Speaker
Model No. : i-deck
FCC ID : TAQMA945311
Brand : Monitor Audio
Power in : DC 3V (Battery*1)
Test Voltage : DC 3V (Battery*1)
Applicant : Monitor Audio Ltd.
Manufacturer : JAZZ HIPSTER CORPORATION

1.2 Characteristic of E.U.T.

Frequency Range : 2420MHz

Function Modulation: GFSK

The EUT is used to transmit control command only. Please refer to the user's manual for the details.

1.3 Test Methodology

For this E.U.T., the radiated emissions measurement performed according to the procedures illustrated in ANSI C63.4 and other required were illustrated in separate sections of this test report for detail.

Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axis. There for only the test data of the worse case (z axis) was used for Radiated test.

1.4 Requirement for Compliance

(1) Field strength of Fundamental

According to 15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (uV/m)	Field Strength of Harmonics (uV/m)
902 – 928 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

(2) Radiation emission

According to 15.249(d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

(3) Radiated emission limits, general requirements.

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(4) Restricted Band

Frequency(MHz)	Frequency(MHz)	Frequency(MHz)	Frequency(GHz)
0.090 - 0.110	16.420 – 16.423	399.9 – 410.0	4.50 – 5.15
¹ 0.495 - 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 41.28	25.50 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.50 – 38.25	1435.0 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73.0 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108.00 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.90 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500.0	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 - 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.1700	3260 – 3267	23.6 – 24.0
12.290 – 12.293	167.72 – 173.20	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358.0	36.43 – 36.5
12.57675 – 12.57725	322.0 – 335.4	3600 - 4400	(²)
13.36 – 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

1.5 The Support Units

No.	Cable	Length	Shielded	Ferrite Core	Shielded Backshell	Supported by lab.	Note
N/A	*	*	*	*	*	*	*

1.6 Layout of the Setup



Connecting Cables :

No.	Cable	Length	Shielded	Ferrite Core	Shielded Backshell	Supported by lab.	Note
N/A	*	*	*	*	*	*	*

Justification:

For both conducted and radiated emission below 1GHz, the system was configured for typical fashion as a customer could normal use it.

For radiated emission, measurement of radiated emission from digital circuit is performed with normal transmitting.

1.7 Test Facility

Test Room	Type of Test Room	Descriptions
<input checked="" type="checkbox"/> TR1	10m semi-anechoic chamber (23m×14m×9m)	Complying with the NSA requirements in documents CISPR 22 and ANSI C63.4. for the radiated emission measurement.
<input type="checkbox"/> TR4	Shielding Room (5m×3m×3m)	For the RF conducted emission measurement.
<input type="checkbox"/> TR5	Shielding Room (8m×5m×4m)	For the conducted emission measurement.

Test Laboratory Competence Information

Central Research Technology Co. has been accredited/filed/authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C. (Taiwan)	CNLA	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033,SL2-IS-E-0033, SL2-A1-E-0033	ISO/IEC 17025
Site Filing Document	USA	FCC	474046	Test facility list & NSA Data
	Canada	IC	4699A	Test facility list & NSA Data
	Japan	VCCI	R-1527,C-1609,T-131	Test facility list & NSA Data
Authorization Certificate	Germany	TÜV Rheinland	N/A	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.8 Measurement Uncertainty

All the measurement uncertainty evaluation procedures in this report are base on ETSI TR 100 028-1, 100 028-2,and ETSI TR 102 273-3. The assessed measurement uncertainties are:

Test Item	Measurement Uncertainty
Field strength of fundamental	Horizontal 4.05dB ; Vertical 4.08dB
Radiated Emission: (below 1GHz)	Horizontal 4.05dB ; Vertical 4.08dB
Radiated Emission: (above 1GHz)	Horizontal 4.58 dB ; Vertical 4.62 dB

2. Radiated Emission Measurement**Result: PASS****2.1 Applied Standard**

According to 15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

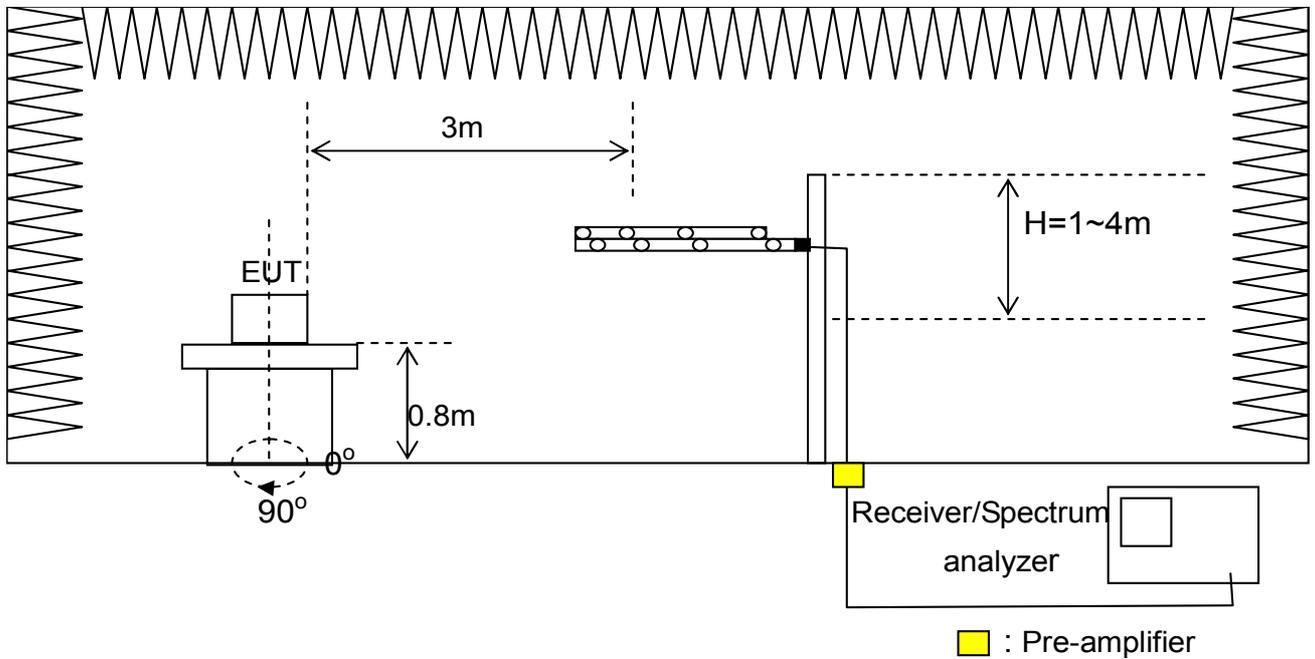
Fundamental Frequency	Field Strength of Fundamental (uV/m)	Field Strength of Harmonics (uV/m)
902 – 928 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

2.2 Measurement Procedure

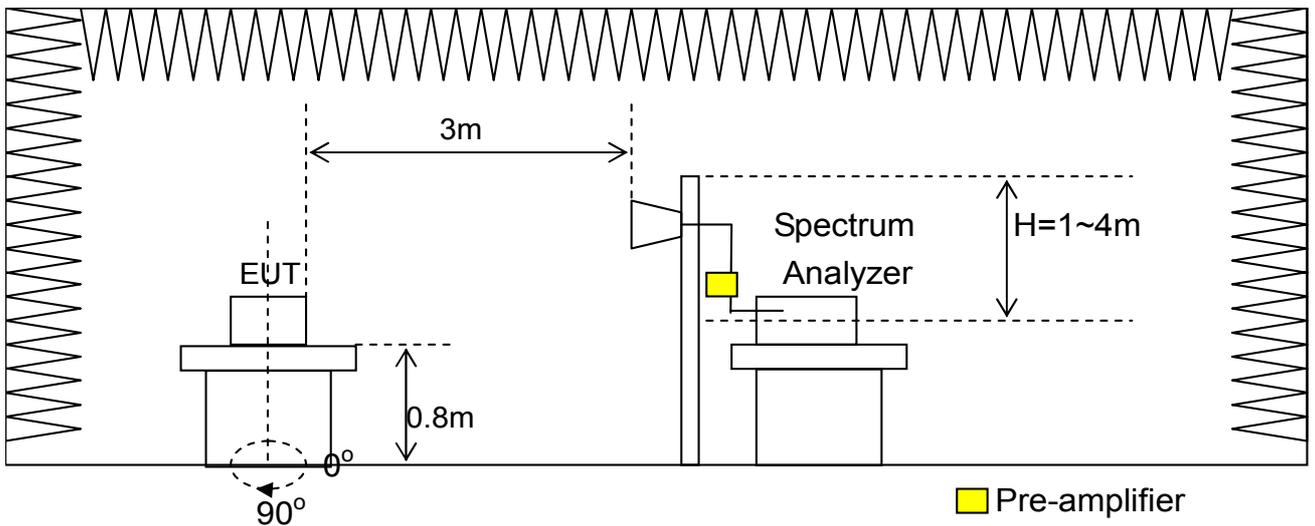
- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. If the EUT is desktop equipment, it was placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 mm above the reference ground plane in the semi-anechoic chamber.
- c. The EUT was set at 3m away from the interference receiving antenna.
- d. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.
- e. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine the fundamental frequency and frequencies associated with higher emission levels and record them.
- f. Then measure each frequency found from step e. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.
- g. Finely tune the antenna and turntable around the recorded position of each frequency found from step f.
- h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.
- i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.
- j. Record the frequency and polarization of the receiving antenna and compare the maximum level with the required limit.
- k. Change the receiving antenna to another polarization to measure radiated emission by following step d. to j. again.
- l. If the peak emission level measured from step e. is 10dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

2.3 Test Configuration

30MHz ~ 1GHz



Above 1GHz



2.4 Test Instruments

Test Site and Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Semi-anechoic Chamber	ETS.LINDGREN	TR1/17627-B	April 12,2005
Test Receiver	R&S	ESCS30/ 836858/020	July 21,2004
Spectrum Analyzer	R&S	FSP40/100031	June 8,2004
Antenna	R&S	HL562/ 360543/007	February 15,2005
Antenna	R&S	HF906/ 359287/001	March 22,2005
Pre-amplifier	MITEQ	JS4-00101800-28-5A/ 742229	June 9,2004
Pre-amplifier	MITEQ	JS4-18002600-30-5A/ 741923	June 21,2004
Pre-amplifier	Mini Circuit	ZKL-2/ 001	April 11,2005

Note :

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	300kHz	Peak	Maxhold	Field Strength of Fundament
30Hz	1kHz	Average	Maxhold	Field Strength of Fundament
120kHz	N/A	Quasi-Peak	Maxhold	Below 1GHz
1MHz	1MHz	Peak	Maxhold	Above 1GHz Peak

Climatic Condition

Ambient Temperature : 27°C ;

Relative Humidity : 68%

2.5 Test Results

Field strength of Fundamental

Test Mode : Transmitter

Test Distance : 3m

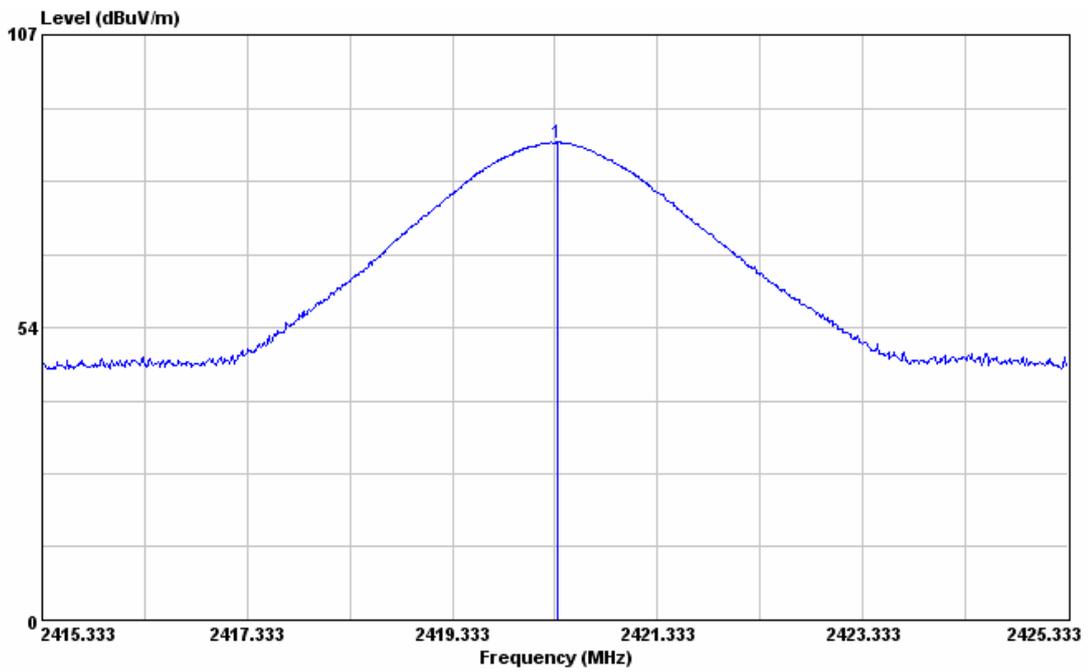
Tester : Bill

Frequency (MHz)	Polarization	Reading Data (dBuV)		Correction Factor (dB/m)	Output Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2420.35	V	86.01	*	1.19	87.20	*	113.98	93.98	26.78	*
2420.33	H	80.18	*	1.19	81.37	*	113.98	93.98	32.61	*

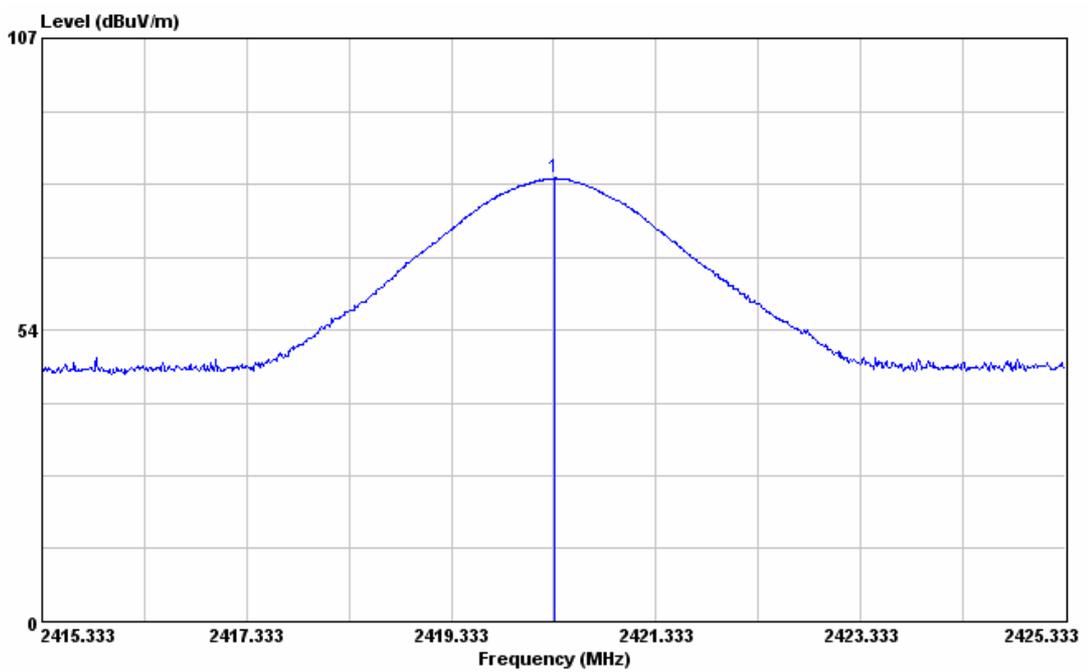
Note :

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Output Field Strength (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Output Field Strength

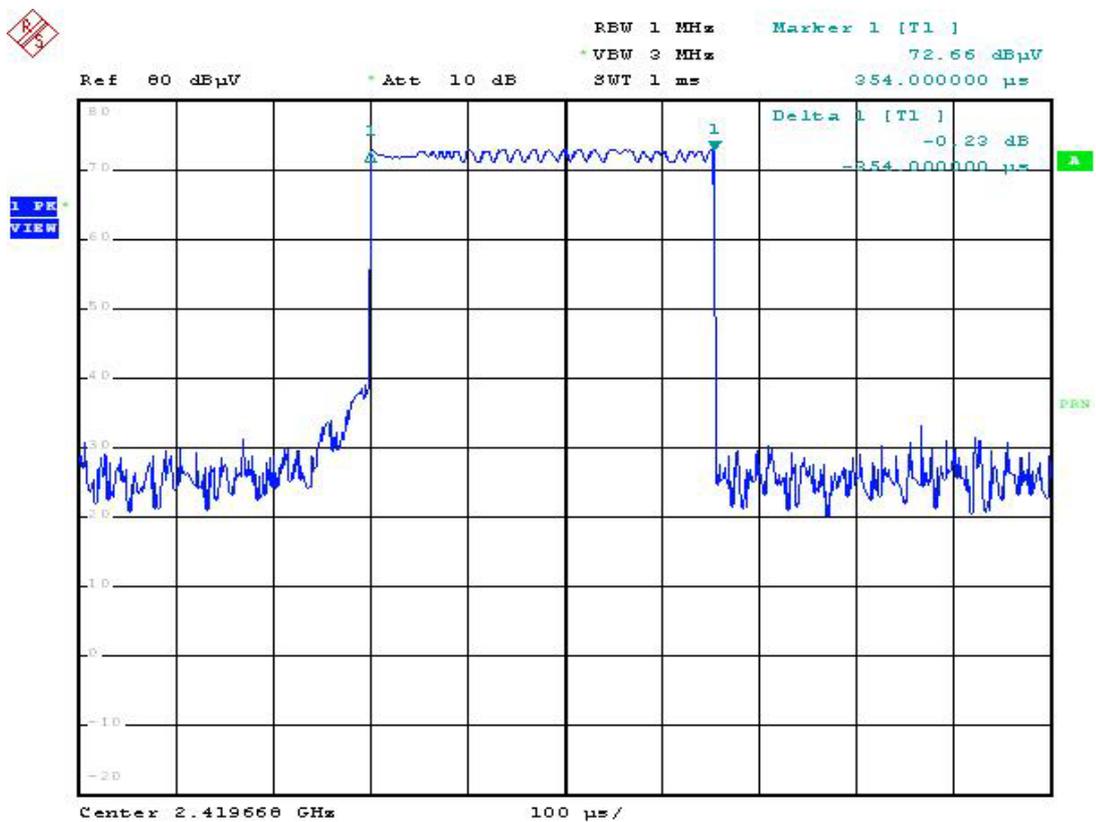
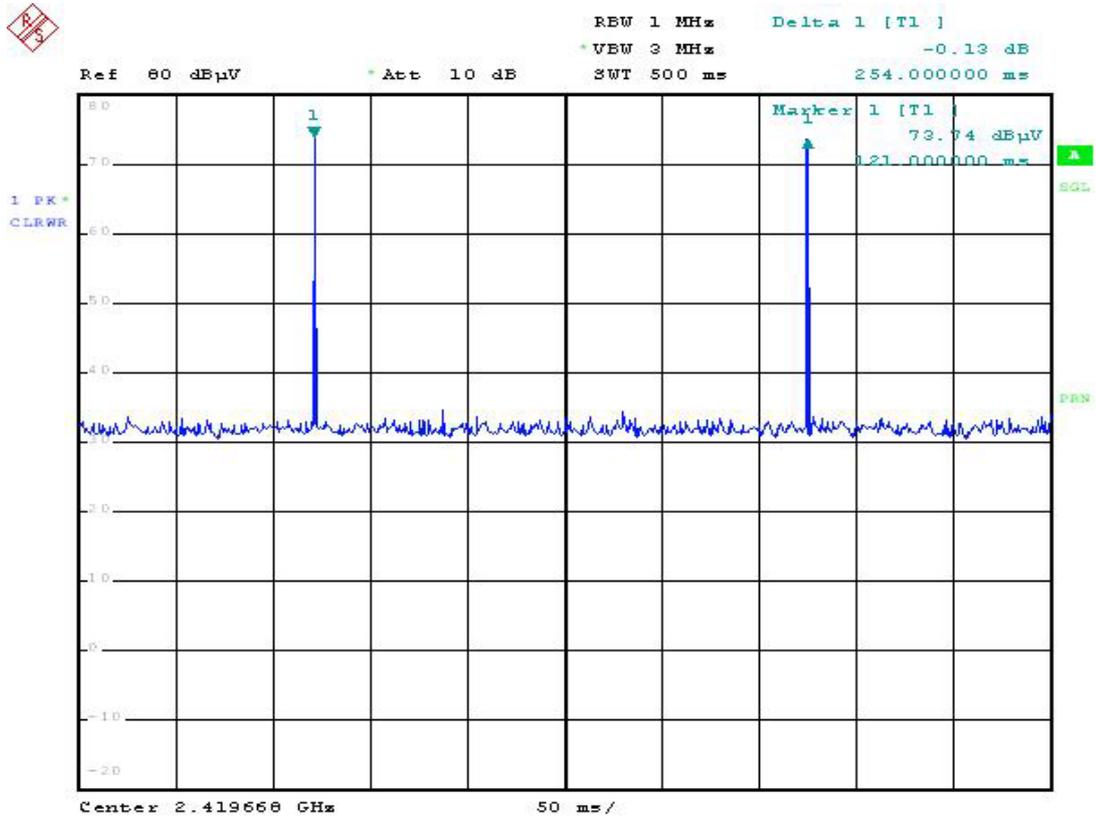
Vertical Polarization



Horizontal Polarization



Duty Cycle



Radiated Emission Measurement below 1000MHz

Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

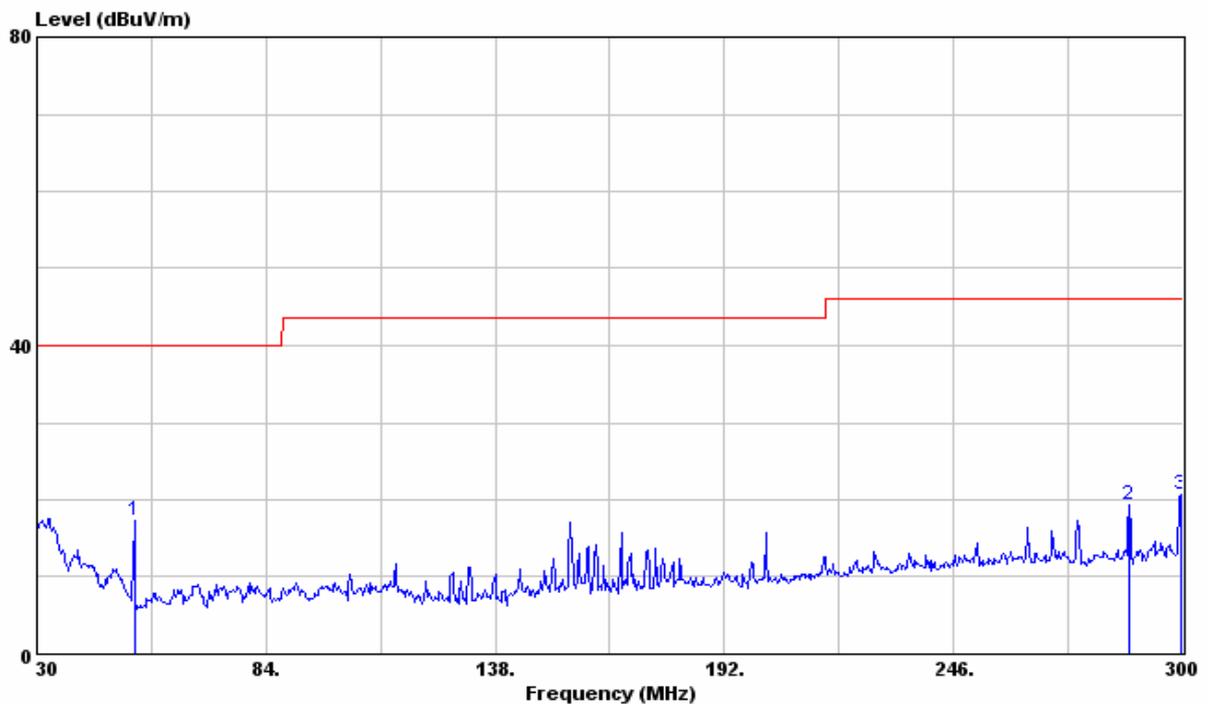
Polarization : Vertical

Frequency Range : 30MHz~300MHz

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	52.95	39.34	-22.06	17.28	40.00	22.72
2	287.31	35.00	-15.75	19.25	46.00	26.75
3	299.46	35.83	-15.20	20.63	46.00	25.37

Note :

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission Level
4. “*”: The emission is too low to be measured.



Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

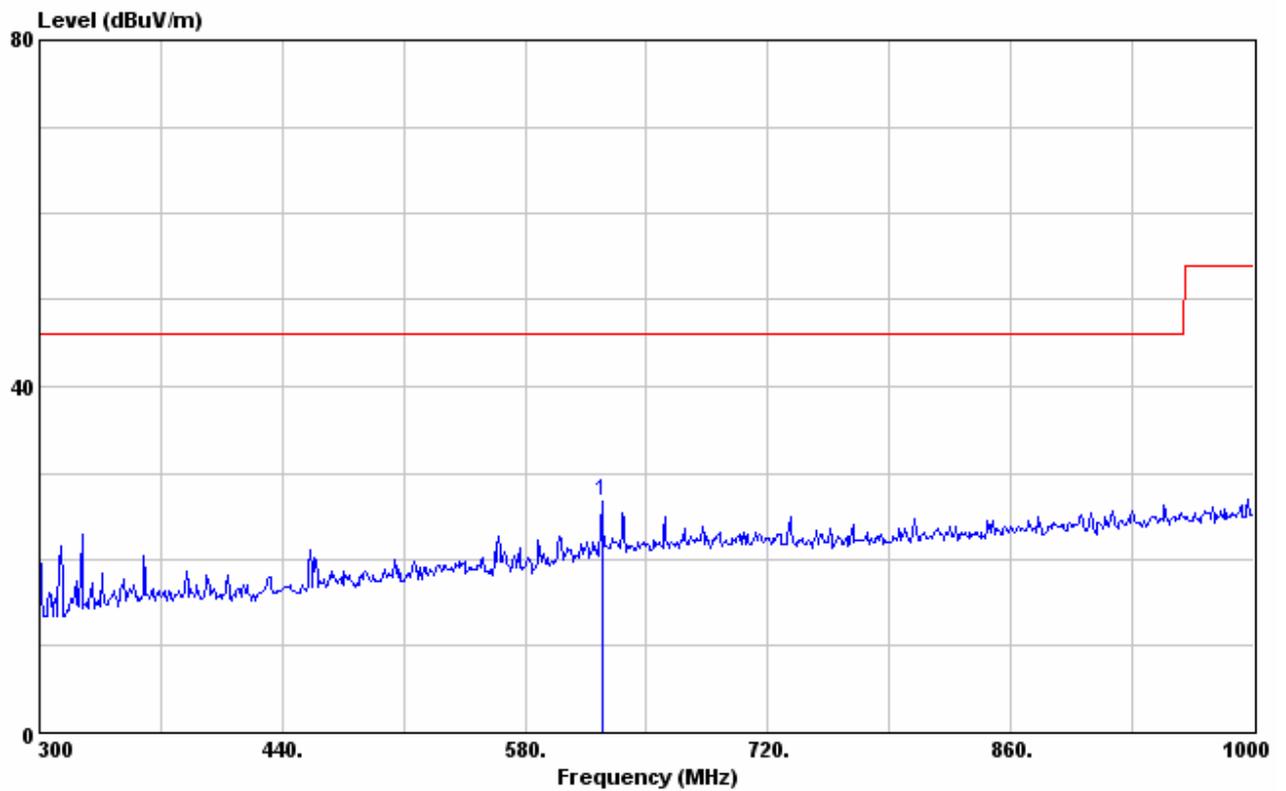
Polarization : Vertical

Frequency Range :300MHz~1GHz

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	624.10	33.50	-6.74	26.76	46.00	19.24

Note :

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission Level
4. “*“: The emission is too low to be measured.



Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

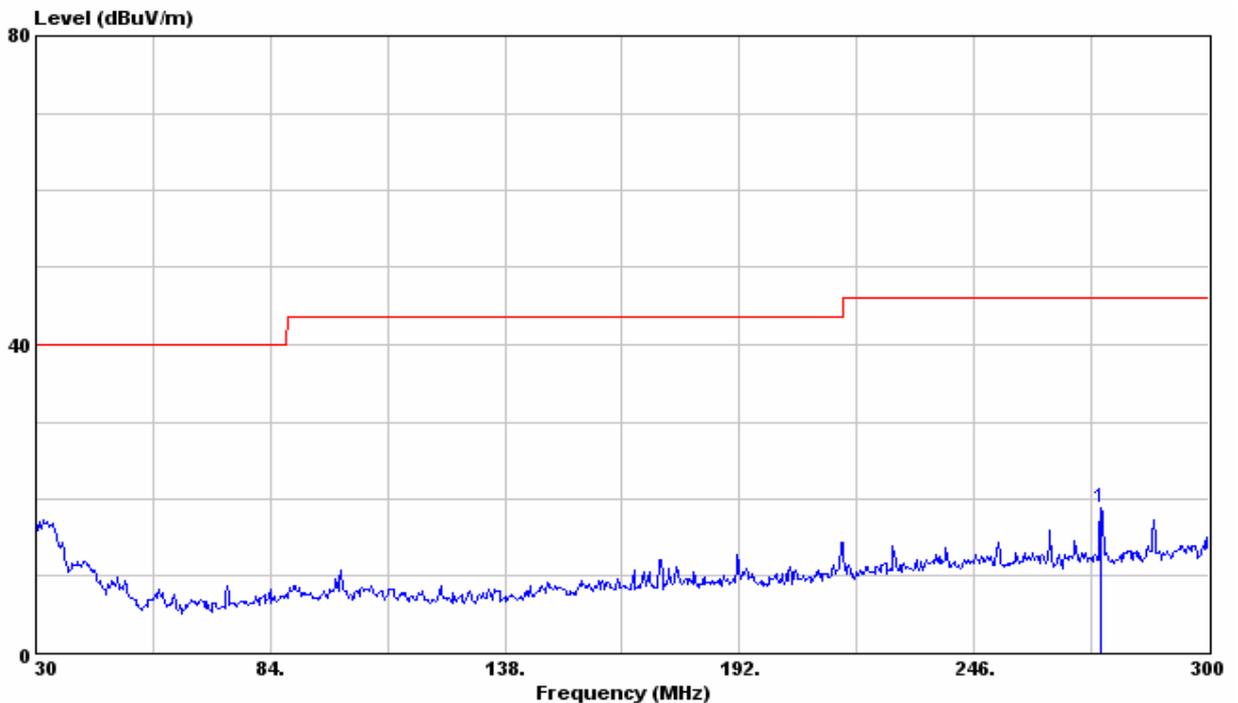
Polarization : Horizontal

Frequency Range : 30MHz~300MHz

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	275.16	35.16	-16.28	18.88	46.00	27.12

Note :

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission Level
4. “*”: The emission is too low to be measured.



Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

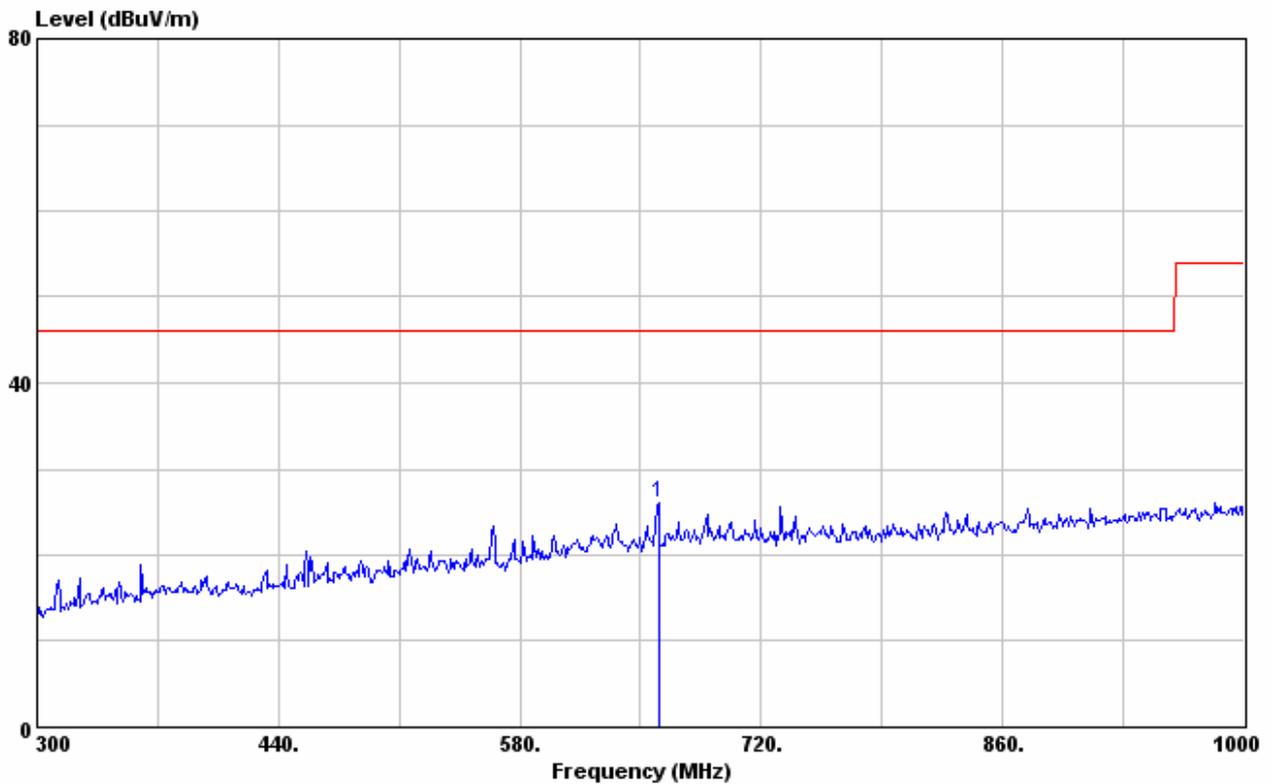
Polarization : Horizontal

Frequency Range : 300MHz~1GHz

	Freq. (MHz)	Reading Data (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	660.50	32.34	-6.33	26.01	46.00	19.99

Note :

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission Level
4. “*”: The emission is too low to be measured.



Radiated Emission Measurement above 1000MHz

Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

Polarization : Vertical

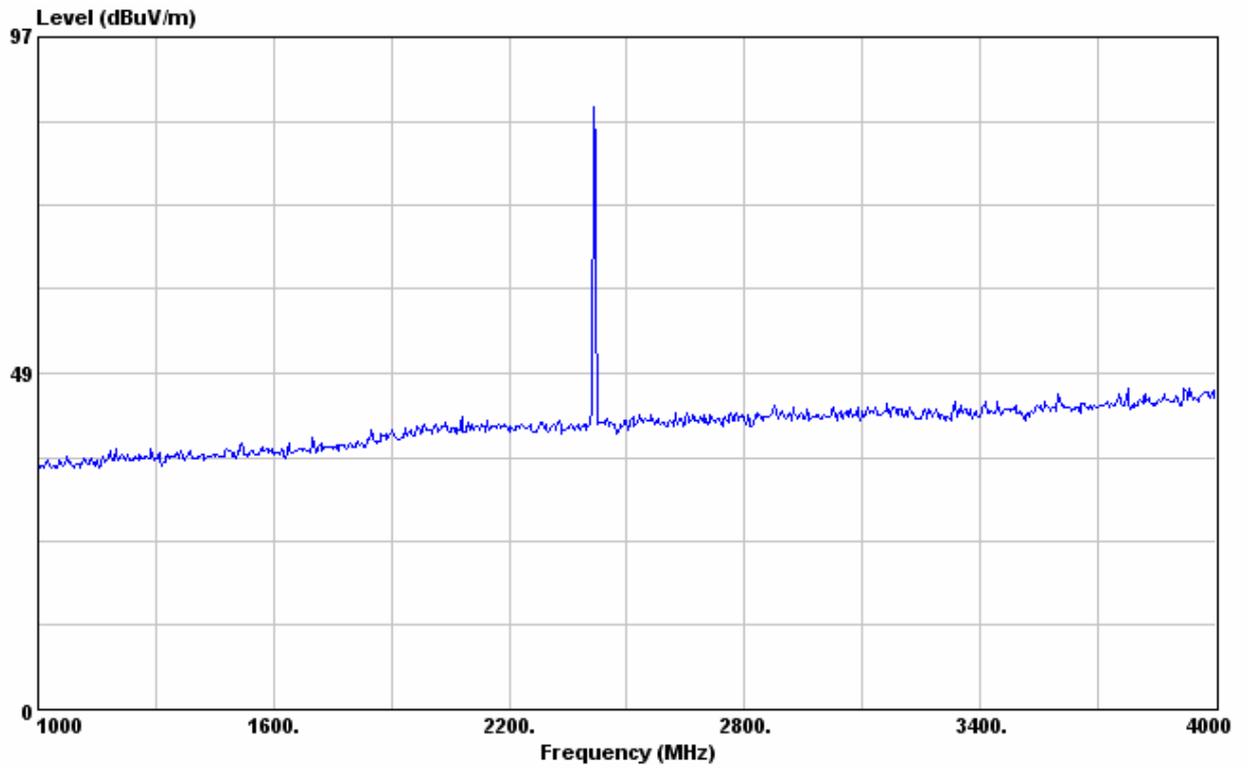
Frequency Range : 1GHz~25GHz

Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
4840	65.33	42.19	7.29	72.62	49.48	74.00	54.00	1.38	4.52
7260	45.50	36.09	12.09	57.59	48.18	74.00	54.00	16.41	5.82
9680	*	*	*	*	*	74.00	54.00	*	*
12100	*	*	*	*	*	74.00	54.00	*	*
14520	*	*	*	*	*	74.00	54.00	*	*
16940	*	*	*	*	*	74.00	54.00	*	*
19360	*	*	*	*	*	74.00	54.00	*	*
21780	*	*	*	*	*	74.00	54.00	*	*
24200	*	*	*	*	*	74.00	54.00	*	*

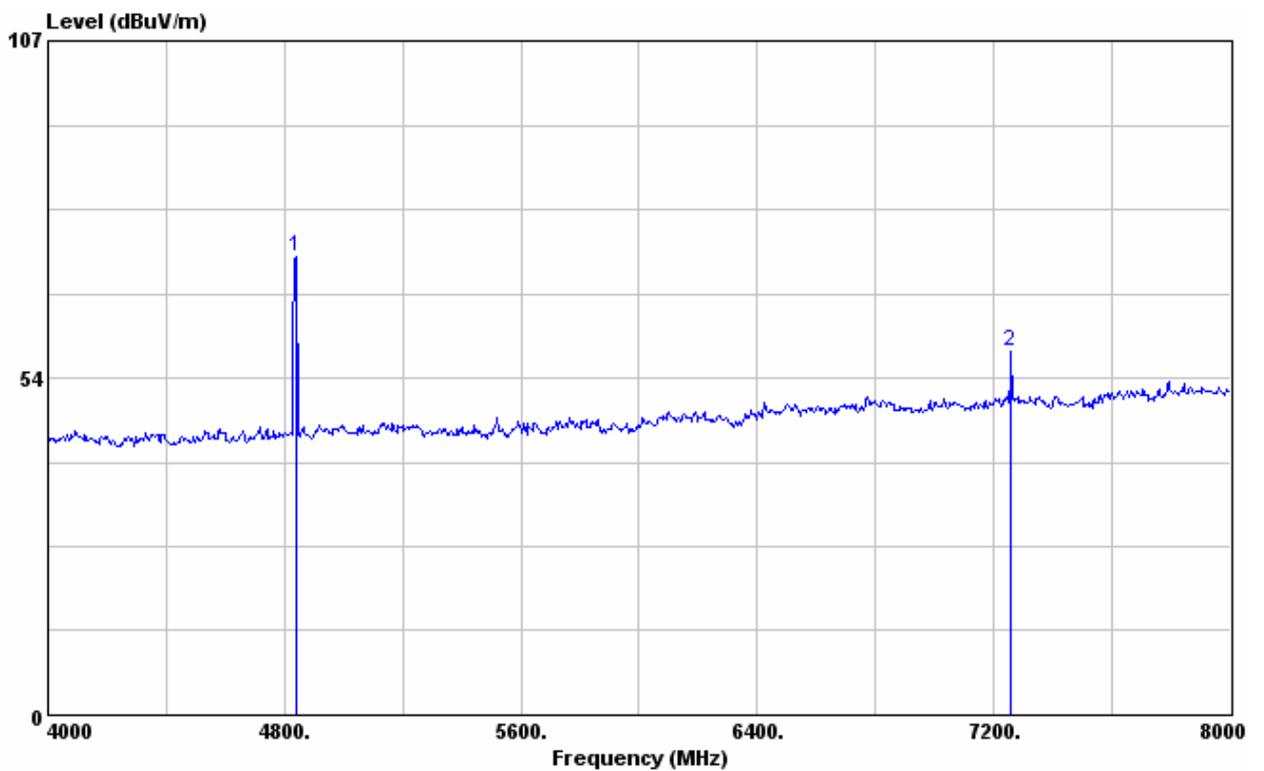
Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preampifier.
3. Margin (dB) = Limit–Emission Level.
4. PK. and AV. are abbreviation of peak and average respectively.
5. “*”: The emission is too low to be measured.

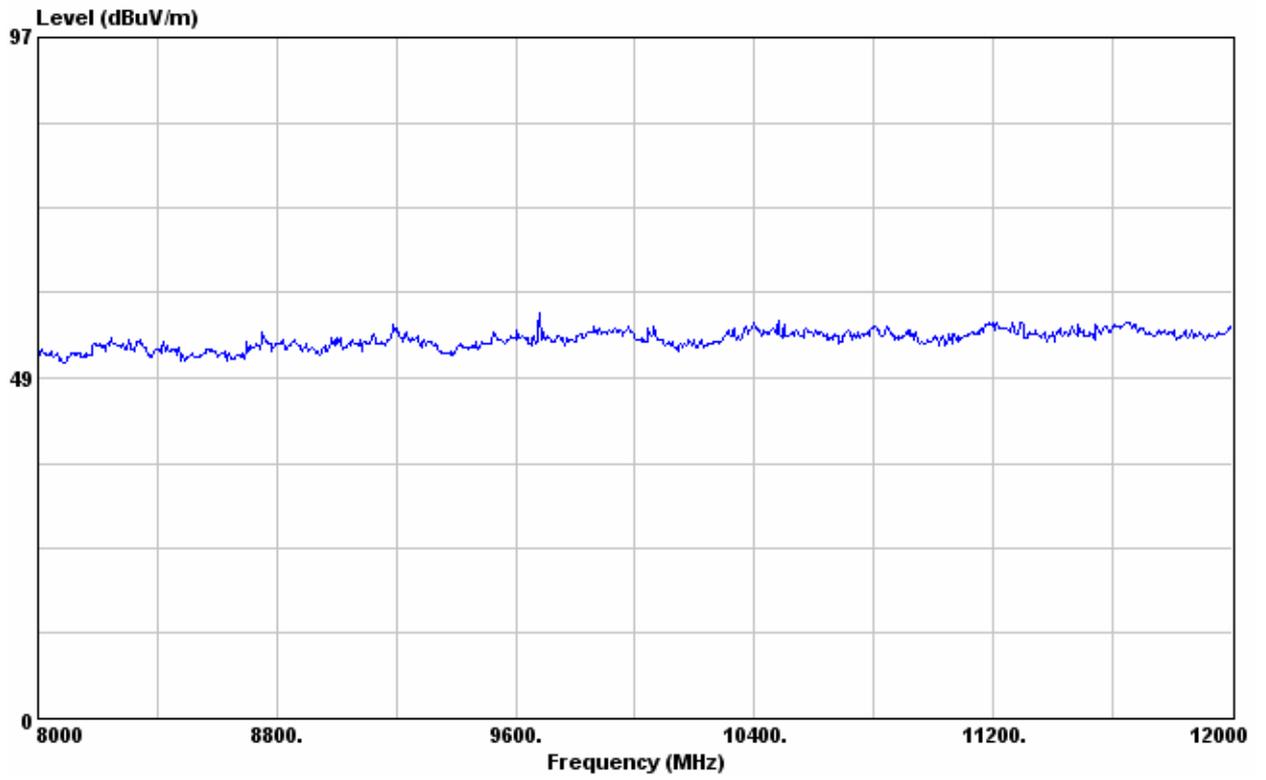
1GHz~4GHz



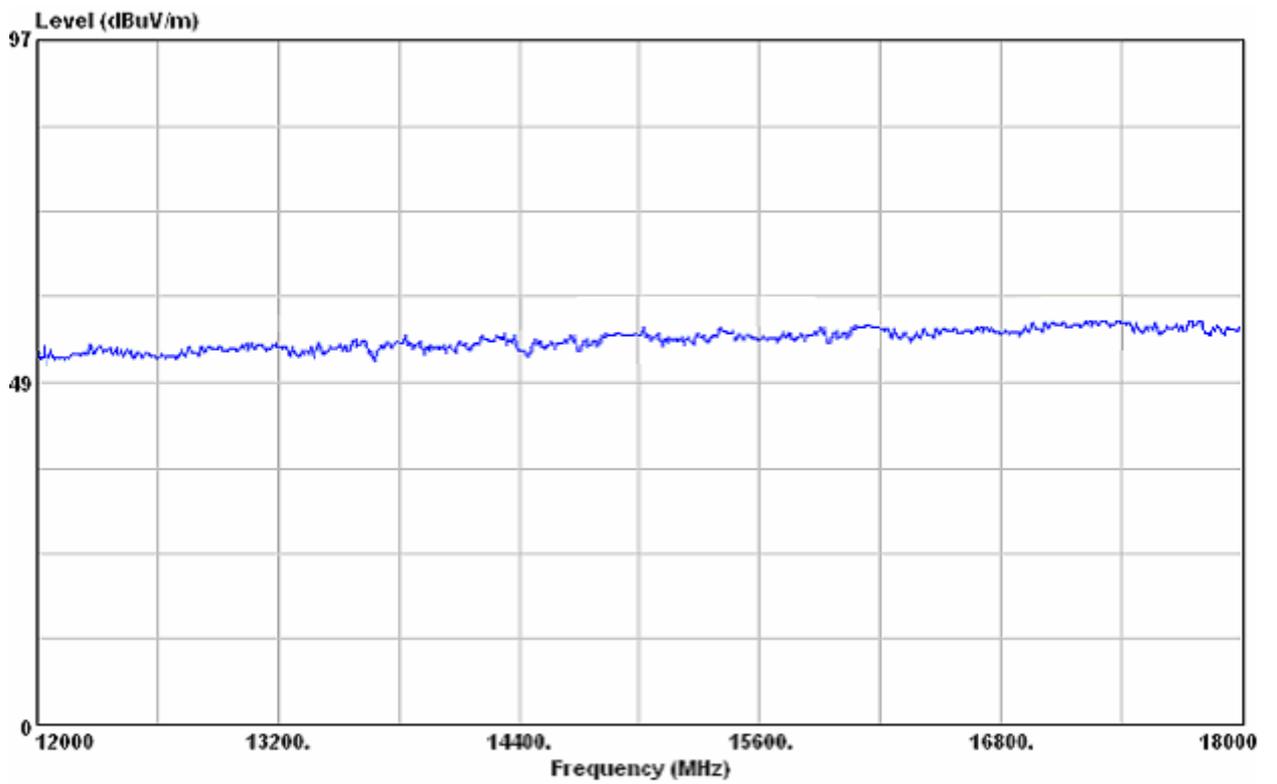
4GHz~8GHz



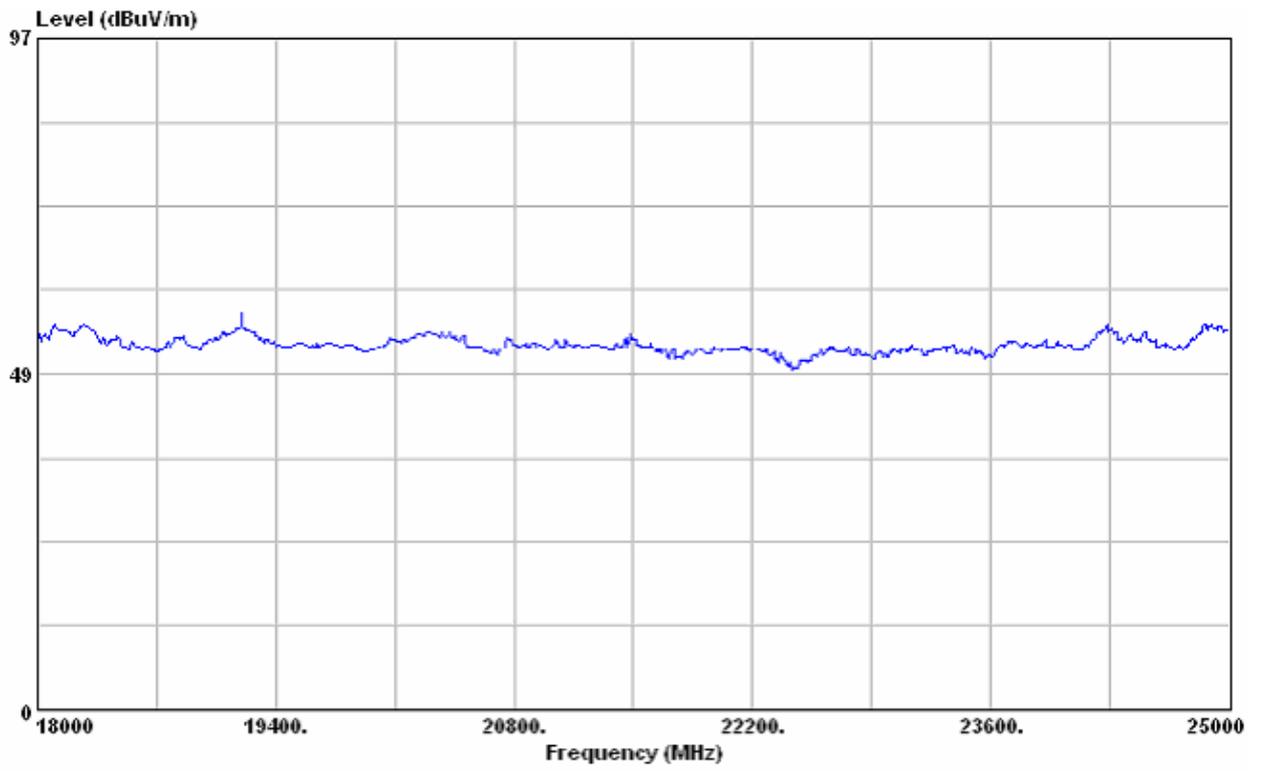
8GHz~12GHz



12GHz~18GHz



18GHz~25GHz



Test Mode : Transmitter

Test Distance : 3m

Tester : Bill

Polarization :Horizontal

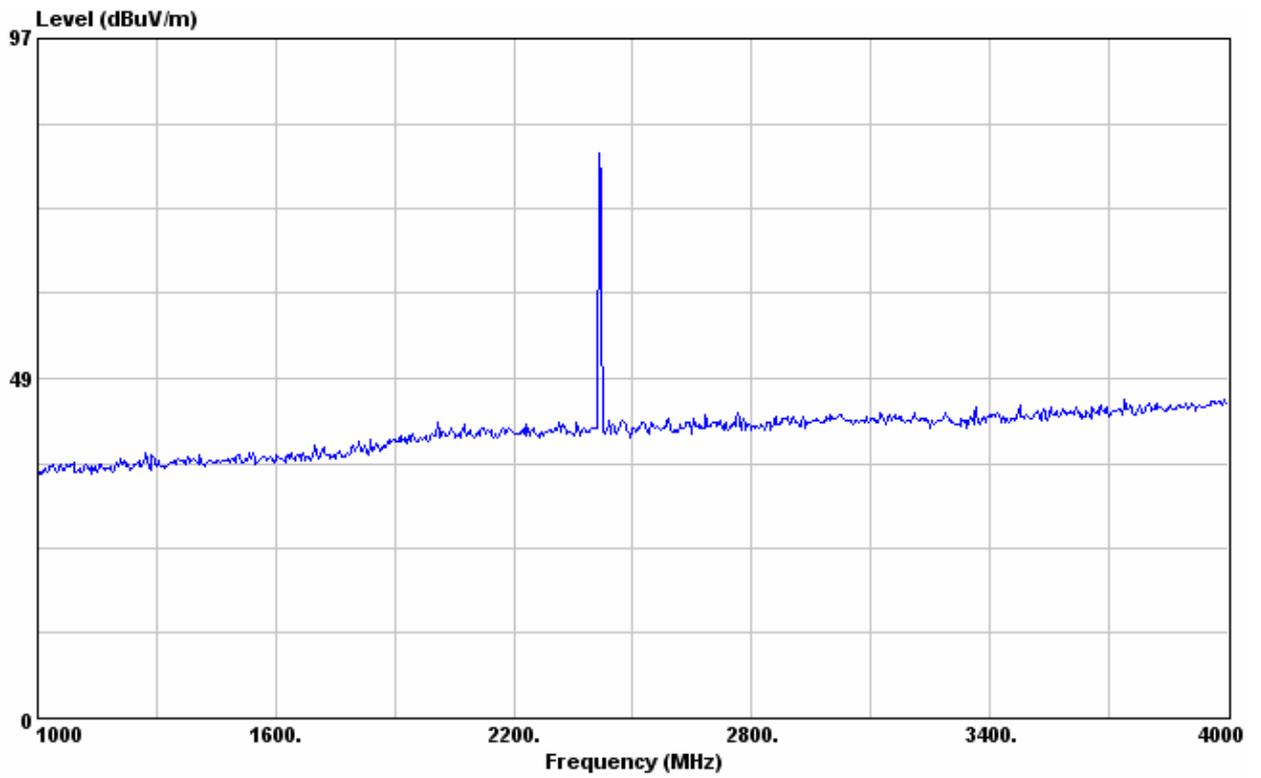
Frequency Range :1GHz~25GHz

Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
	PK	AV		PK	AV	PK	AV	PK	AV
4832	63.17	42.68	7.25	70.42	49.97	74.00	54.00	3.58	4.03
7260	47.34	36.70	12.09	59.43	48.79	74.00	54.00	14.57	5.21
9680	*	*	*	*	*	74.00	54.00	*	*
12100	*	*	*	*	*	74.00	54.00	*	*
14520	*	*	*	*	*	74.00	54.00	*	*
16940	*	*	*	*	*	74.00	54.00	*	*
19360	*	*	*	*	*	74.00	54.00	*	*
21780	*	*	*	*	*	74.00	54.00	*	*
24200	*	*	*	*	*	74.00	54.00	*	*

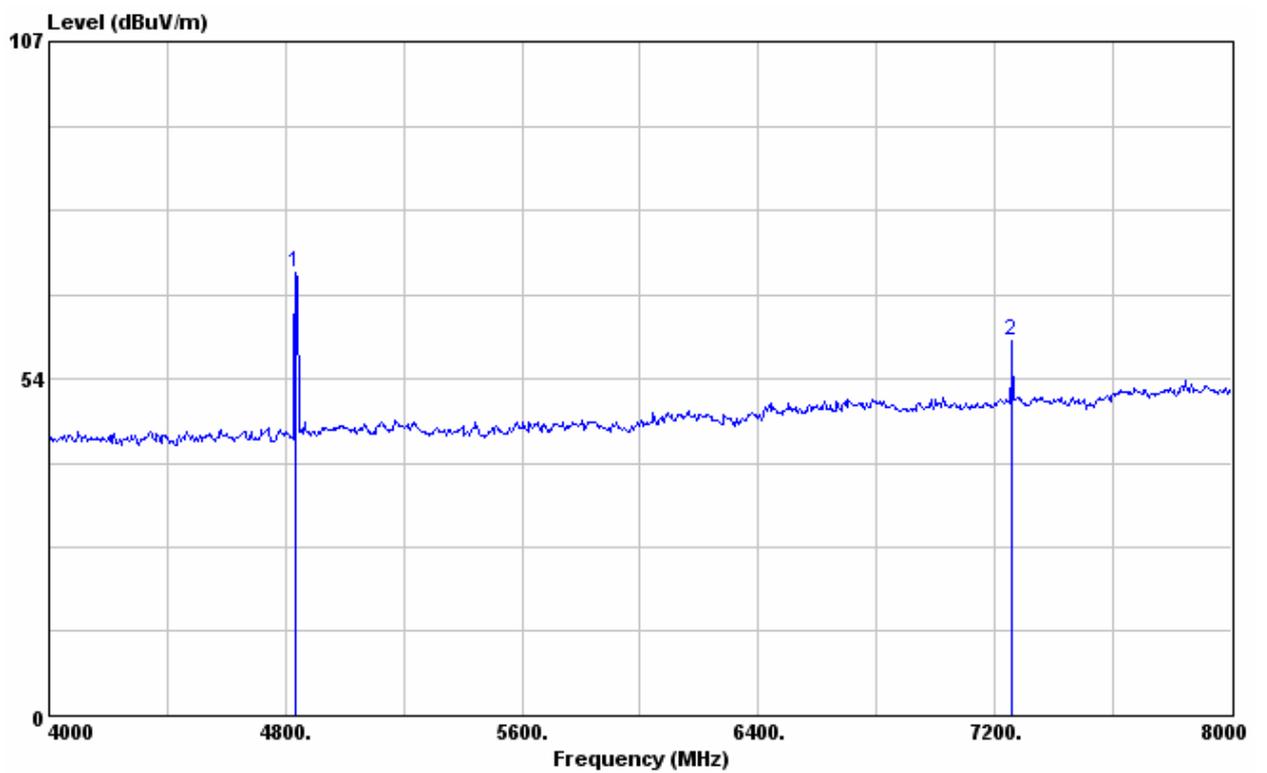
Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier.
3. Margin (dB) = Limit–Emission Level.
4. PK. and AV. are abbreviation of peak and average respectively.
5. “*“: The emission is too low to be measured.

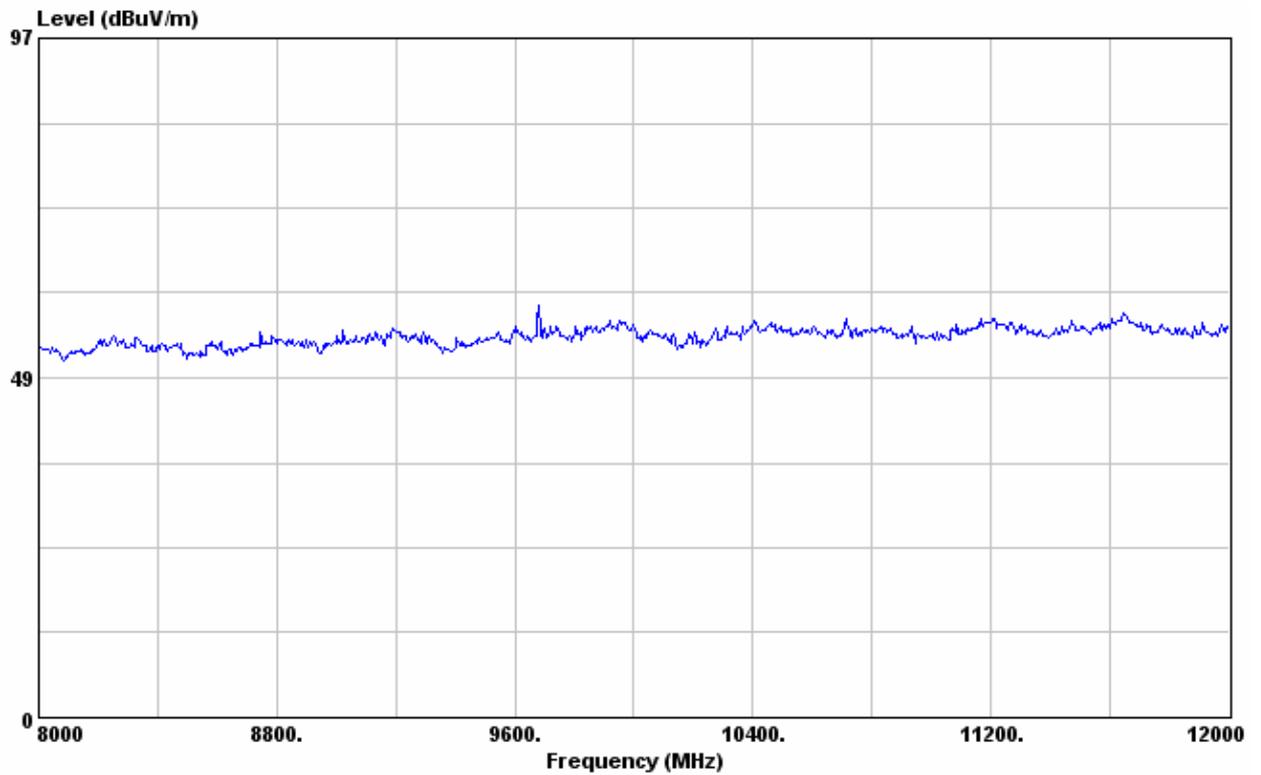
1GHz~4GHz



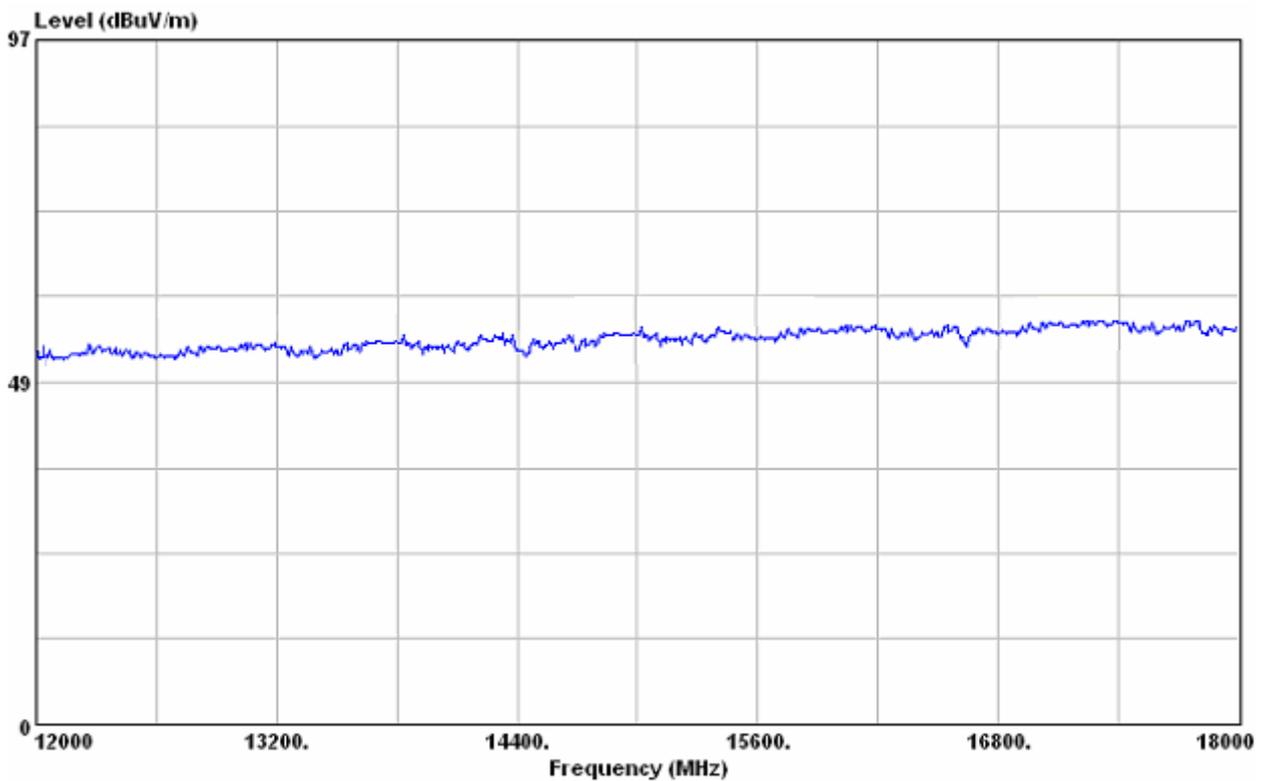
4GHz~8GHz



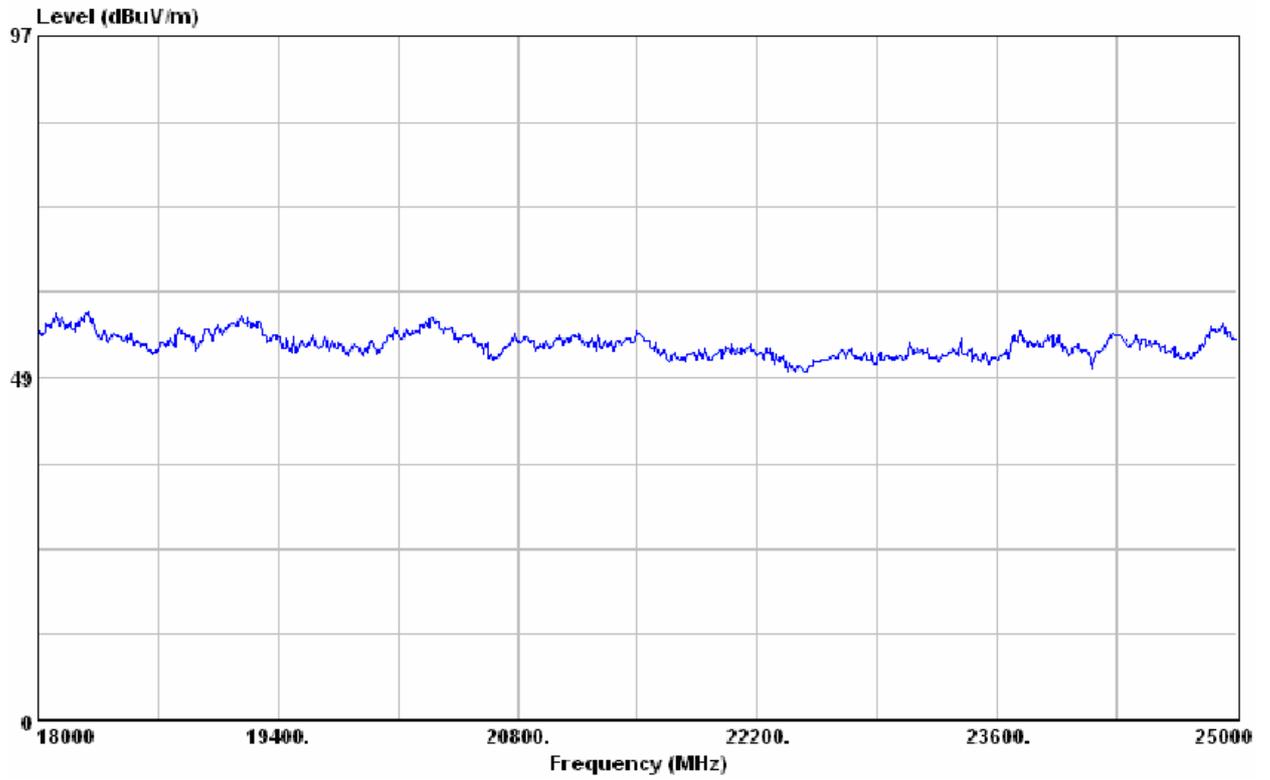
8GHz~12GHz



12GHz~18GHz



18GHz~25GHz



參照頁 (非報告一部分,列印時不列印此參照頁)

報告編號 : RF-A25-0505-023
 受測產品 : Amplifier Speaker
 FCC ID : TAQMA945311
 廠牌 : Monitor Audio
 型號 : i-deck
 製造者 : JAZZ HIPSTER CORPORATION
 申請者 : Monitor Audio Ltd.
 申請者地址 : 24 Brook Road, Rayleigh Essex SS6 7XL U.K.
 申請者電話 : 44-01268-740580
 收件日期 : May 20, 2005
 測試日期 : May 23, 2005
 報告日期 : May 24, 2005
 發射器 : 遙控器
 接收器 : 接收機
 發射功率(電場強度) : 27.90dBuV/m
 工作頻率 : 見第 4 頁
 天線規格 : 見第 19 頁
 額定輸入電壓 : DC 3V (發射機); 5V (接收機)
 測試輸入電壓 : DC 3V(發射機 2顆AAA電池); 5V (接收機 USB)
 頻率範圍 : 2420MHz
 調變技術 : GFSK
 溫度 : 27°C
 溼度 : 68%
 TR1測試員 : Bill
 TR4測試員 : Bill
 TR5測試員 : Bill

設備名稱	製造商	型號/序號	上次校驗日期
TR1			April 12,2005
TR4			NCR
TR5			NCR
頻譜分析儀	R&S	FSP40/100031	June 8,2004
接收機	R&S	ESCS30/ 836858/020	July 21,2004
天線	R&S	HL562/ 360543/006	February 15,2005
天線906	R&S	HF906/ 359287/001	March 22,2005
天線3116	EMCO	3116/ 20552	May 27,2004

前置放大器	MITEQ	JS4-00101800-28-5A/ 742229	June 9,2004
前置放大器	MITEQ	JS4-18002600-30-5A/ 741923	June 21,2004
前置放大器	MITEQ	ZKL-2/ 001	April 11,2005
高通濾波器	MCI	H04G13G1/ 2467-01	March 1,2004
衰減器	HP	8495B/ 2814A13358	Decemebr 29,2004
接收機	R&S	ESCS30/ 836858/021	Jauary 6,2005
電源阻抗模擬網路	R&S	ESH2-Z5/ 836613/001	Jauary 4,2005
電源阻抗模擬網路	R&S	ENV4200/ 833209	Jauary 4,2005
量測項目	量測不確定度		
峰值輸出功率	水平極化4.62 dB；垂直極化4.56 dB		
頻帶邊緣	水平極化4.62dB；垂直極化4.56dB		
載波頻率頻道間隔	4.56 Hz		
不必要之發射：輻射發射測試 (1GHz以下)	水平極化4.05dB；垂直極化4.08dB		
不必要之發射：輻射發射測試 (1GHz以上)	水平極化4.58 dB；垂直極化4.62 dB		
交流電力線傳導發射測試	2.26 dB		