

APPLICATION FOR CERTIFICATION

On Behalf of

Futaba Corporation

Radio Control

Model No. : T4PK-2.4G

FCC ID : AZPT4PK-24G

Brand : Futaba

Prepared for : Futaba Corporation
1080 Yabutsuka Chosei-son Chosei-gun
Chiba, 299-4395 Japan.

Prepared by : Audix Technology Corporation
EMC Department
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Date of Report : Jan. 31, 2008

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TEST REPORT CERTIFICATION

Applicant : Futaba Corporation
 Manufacturer : Futaba Corporation
 EUT Description : Radio Control
 FCC ID : AZPT4PK-24G
 (A) MODEL NO. : T4PK-2.4G
 (B) SERIAL NO. : N/A
 (C) BRAND : Futaba
 (D) POWER SUPPLY : DC 6V
 (E) TEST VOLTAGE : DC 6V (Battery)

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, SEPTEMBER 2007
AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.205, §15.207, §15.209 and §15.247)

The device described above was tested by Audix Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and Audix Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology Corporation.

Date of Test: Jan. 15 ~ 28, 2008

Prepared by: Monica Chang Feb. 14, 2008
(Monica Chang/Administrator)

Test Engineer: Ben Cheng Feb. 15, 2008
(Ben Cheng/Section Manager)

Approved & Authorized Signer: Leon Liu Feb. 15, 2008
(Leon Liu/Vice President)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Radio Control (Transmitter Unit)
Model Number	:	T4PK-2.4G
Serial Number	:	N/A
Brand	:	Futaba
FCC ID	:	AZPT4PK-24G
Applicant	:	Futaba Corporation 1080 Yabutsuka Chosei-son Chosei-gun Chiba, 299-4395 Japan.
Manufacturer	:	Futaba Corporation 1080 Yabutsuka Chosei-son Chosei-gun Chiba, 299-4395 Japan.
Radio Technology	:	DSSS Modulation
Frequency Band	:	2405.376MHz - 2477.056MHz
Tested Frequency	:	2405.376MHz (Channel 02) 2442.240MHz (Channel 38) 2477.056 MHz (Channel 72)
Frequency Channel	:	36 channels
Antenna (Pencil Antenna)	:	Antenna Gain: 1.3dBi
Receiver	:	Futaba, M/N R604FS FCC by DoC (Report Number: EM-F970073)
Date of Receipt of Sample	:	Jan. 09, 2008
Date of Test	:	Jan. 15 ~ 28, 2008

1.2. Tested Supporting System Details

1.2.1. PC SYSTEM

Model Number : VECTRA XE320
 Serial Number : SG21101966
 FCC ID : By DoC
 BSMI ID : 3912A318
 Brand : HP
 Manufacturer : First International Computer
 Power Cord : Non-Shielded, Detachable, 1.8m

1.2.2. 15" LCD MONITOR

Model Number : D5063M
 Serial Number : CN206A6034
 FCC ID : ARSLM562H
 BSMI ID : R33037
 Manufacturer : Top Victory Electronics (Fujian) Co., Ltd.
 D-Sub Cable : Shielded, Detachable, 1.8m
 Bonded two ferrite cores
 AC Adapter : Delta, M/N ADP-40TB
 BSMI ID 3892D142
 Cord: Shielded, Undetachable, 1.8m
 Bonded a ferrite core
 Power Cord : Non-Shielded, Detachable, 1.8m

1.2.3. KEYBOARD

Model Number : SDM4700P
 Serial Number : B69360HLPPD0R6
 FCC ID : By DoC
 BSMI ID : R33018
 Manufacturer : SAMSUNG (Brand: HP)
 Data Cable : Non-Shielded, Undetachable, 1.8m

1.2.4. MOUSE

Model Number : M-S69
 Serial Number : F6AB70S5BOY1NWZ
 FCC ID : JNZ211443
 BSMI ID : R41126
 Manufacturer : Logitech (Brand: HP)
 Data Cable : Non-Shielded, Undetachable, 1.8m

1.2.5. DC POWER SUPPLY (To EUT)

Model Number : 3303A
 Serial Number : 721773
 Manufacturer : TOP WARD
 DC Power Cable : Non-Shielded, Detachable, 1.2m
 AC Power Cord : Non-Shielded, Detachable, 1.8m

1.2.6. CONVERSION BOARD (RS-232 Level Conversion Circuit)

Part Number : 050200006
 Serial Number : N/A
 Manufacturer : FUTABA
 RS-232 Cable : Shielded, Detachable, 1.5m (To PC System)
 Data Cable : Non-Shielded, Detachable, 0.25m (To EUT)

1.3. Description of Test Facility

Name of Firm : **Audix Technology Corporation**
EMC Department

 No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei, Taiwan

Test Location & Facility : **No. 2 Shielded Room**
Semi-Anechoic Chamber
 (C2/ AC) No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei, Taiwan.

 May 15, 2006 File on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB), (V/m)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.94dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $ku_c(y)$

Test Item	Uncertainty
6dB Bandwidth	± 0.05kHz
Emission Limitations	± 0.13dB
Maximum peak output power	± 0.33dBm
Band edges	± 0.13dB
Power spectral density	± 0.13dB

2. CONDUCTED EMISSION MEASUREMENT

【The EUT only employs battery power for operation, no conductive emission limits are required according to FCC Part 15 section §15.207(c)】

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz-1000MHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY42000134	Jun. 27, 07'	Jun. 26, 08'
2.	Test Receiver	R & S	ESCS30	100265	Sep. 04, 07'	Sep. 03, 08'
3.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 03, 07'	Mar. 02, 08'
4.	Biconical Antenna	CHASE	VBA6106A	1264	Apr. 11, 07'	Apr. 10, 08'
5.	Log Periodic Antenna	Schwarzbeck	UHALP910 8-A	0139	Apr. 11, 07'	Apr. 10, 08'

3.1.2. For Frequency Range Above 1GHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY42000134	Jun. 27, 07'	Jun. 26, 08'
2.	Pre-Amplifier	HP	8449B	3008A01284	Jun. 22, 07'	Jun. 21, 08'
3.	2.4GHz Notch Filter	EWT	EWT-14-0 070-R1	G2	Dec. 08, 07'	Dec. 07, 08'
4.	Horn Antenna	EMCO	3115	9112-3775	May 23, 07'	May 22, 08'
5.	Horn Antenna	EMCO	3116	2653	Oct. 04, 07'	Oct. 03, 08'

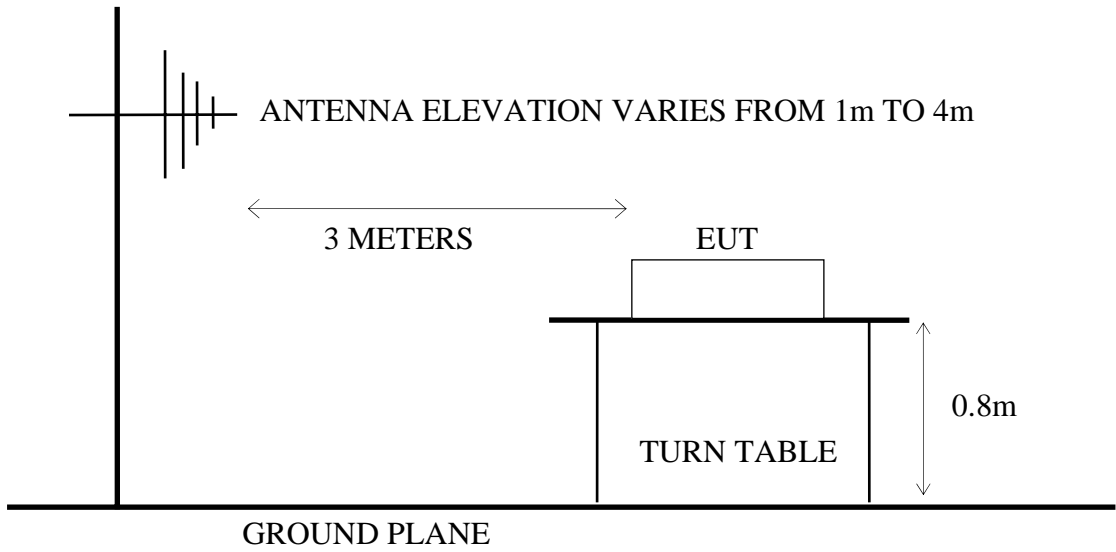
3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators

RADIO CONTROL (EUT)

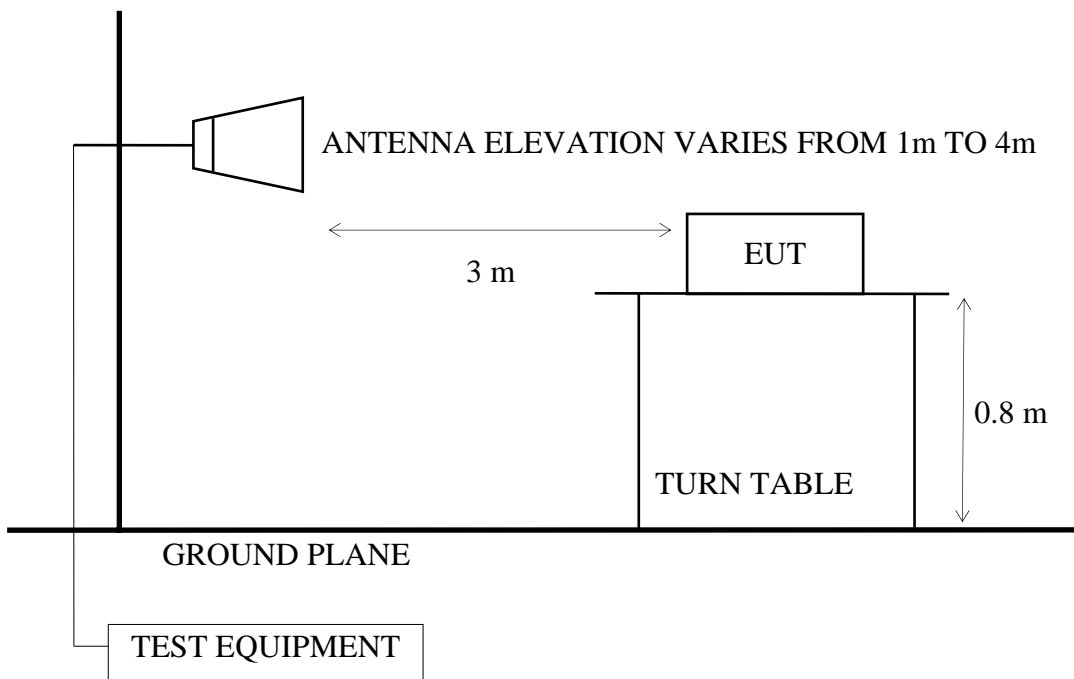
3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz

ANTENNA TOWER



3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz

ANTENNA TOWER



3.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

- Remark :
- (1) Emission level ($\text{dB}\mu\text{V/m}$) = 20 log Emission level ($\mu\text{V/m}$)
 - (2) The tighter limit applies at the edge between two frequency bands.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 - (4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
 - (5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown on 3.2.
- 3.4.2. Turned on the power of all equipment.
- 3.4.3. The EUT was preset by the PC system using test program "FutabaTerm".
- 3.4.4. The EUT was set to continuously transmit signals at frequency 2405.376MHz (stand, side, lying), 2442.240MHz (stand) and 2477.056MHz (stand) during testing.
- 3.4.5. The EUT was set to continuously receive signals at frequency 2442.240MHz (stand) during testing.

3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 25GHz (Up to 10th harmonics from fundamental frequency) was checked.

3.6. Test Results

PASSED.

(All emissions not reported below are too low against the prescribed limits.)

EUT : Radio Control M/N : T4PK-2.4G

Test Date : Jan. 18, 2008 Temperature : 21 Humidity : 60%

For Frequency Range 30MHz~1000MHz:

The EUT with the following test modes was tested during the testing and all the test results are listed in section 3.6.1.

Mode	Channel	Frequency	Test Mode	Attitude
1.	02	2405.376MHz	Transmitting	Stand
2.			Transmitting	Side
3.			Transmitting	Lying
4.	38	2442.240MHz	Transmitting	Stand
5.	72	2477.056MHz	Transmitting	Stand
6.	38	2442.240MHz	Receiving	Stand

* Above all final readings were measured with Quasi-Peak detector.

For Frequency above 1GHz:

The EUT with the following test modes was tested during the testing and all the test results are listed in section 3.6.2.

Mode	Channel	Frequency	Test Mode	Attitude
1.	02	2405.376MHz	Transmitting	Stand
2.			Transmitting	Side
3.			Transmitting	Lying
4.	38	2442.240MHz	Transmitting	Stand
5.	72	2477.056MHz	Transmitting	Stand
6.	38	2442.240MHz	Receiving	Stand

* Above all final readings were measured with Peak detector and Average detector.

For Restricted Bands:

The EUT was tested in restricted bands and all the test results are listed in section 3.6.3. (The restricted bands defined in part 15.205(a))

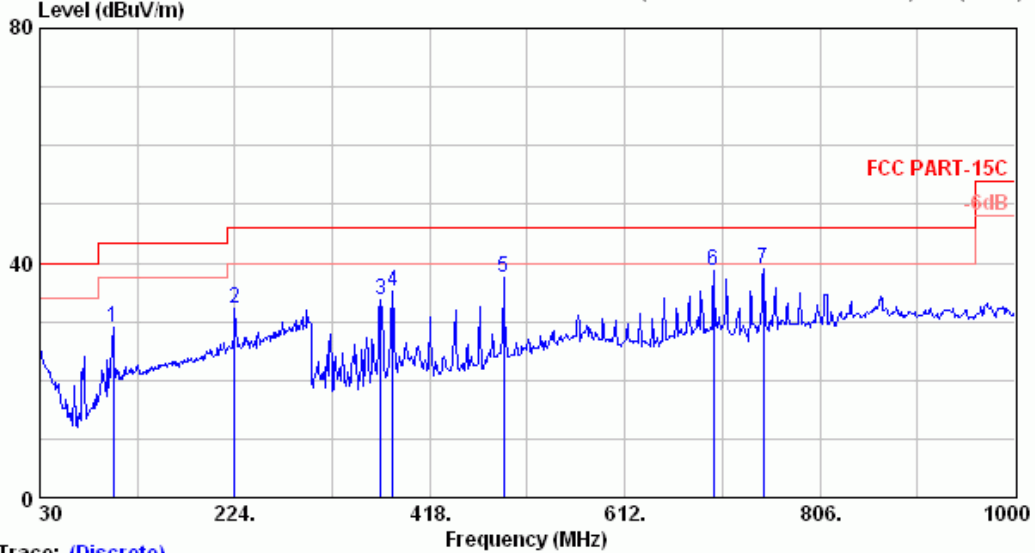
Mode	Channel	Frequency	Test Mode
1.	02	2405.376MHz	Transmitting
2.	72	2477.056MHz	Transmitting

3.6.1. Frequency Range 30-1000MHz



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Data: 8 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)FCC(T4PK)R



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 8
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH02)

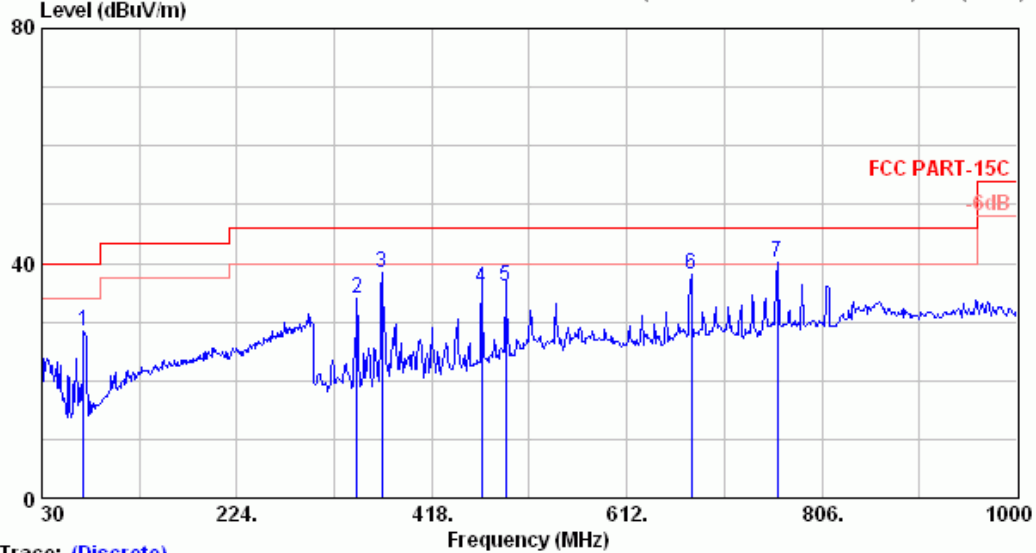
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	102.750	17.40	2.10	9.41	28.91	43.50	14.59	
2	224.000	21.96	3.30	7.08	32.35	46.00	13.65	
3	369.500	16.93	4.60	12.14	33.67	46.00	12.33	
4	381.140	17.27	4.60	13.16	35.03	46.00	10.97	
5	491.720	18.61	6.33	12.44	37.38	46.00	8.62	
6	700.270	23.46	6.50	8.67	38.63	46.00	7.37	
7	749.740	23.25	6.70	9.05	39.00	46.00	7.00	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 7 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH02)

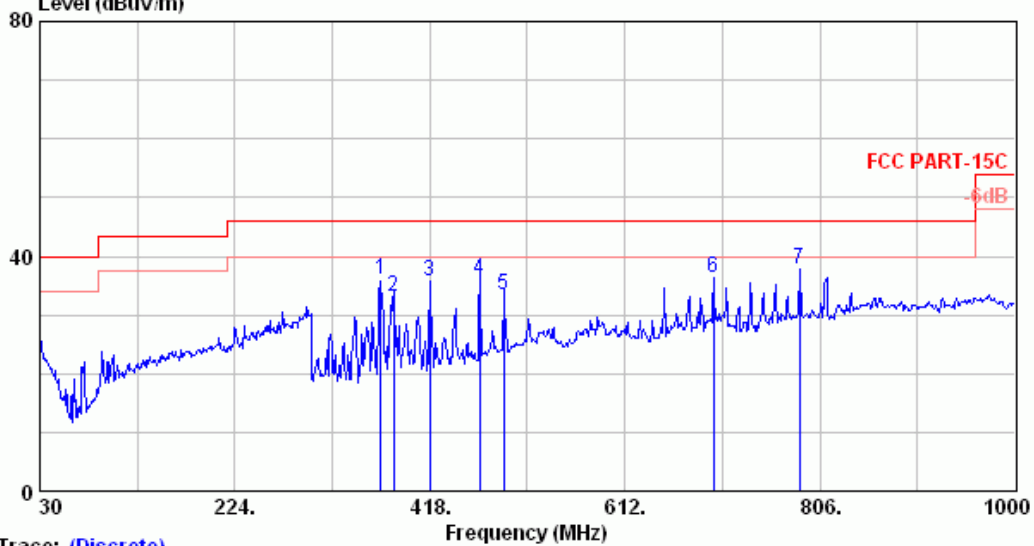
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	71.710	12.26	1.80	14.24	28.31	40.00	11.69	
2	343.310	15.05	4.34	14.65	34.03	46.00	11.97	
3	368.530	16.88	4.60	16.77	38.25	46.00	7.75	
4	467.470	18.21	5.80	11.73	35.74	46.00	10.26	
5	491.720	18.61	6.33	11.11	36.05	46.00	9.95	
6	676.020	22.89	6.40	8.81	38.09	46.00	7.91	
7	761.380	23.68	6.70	9.66	40.04	46.00	5.96	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 8 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 8
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Side(CH02)

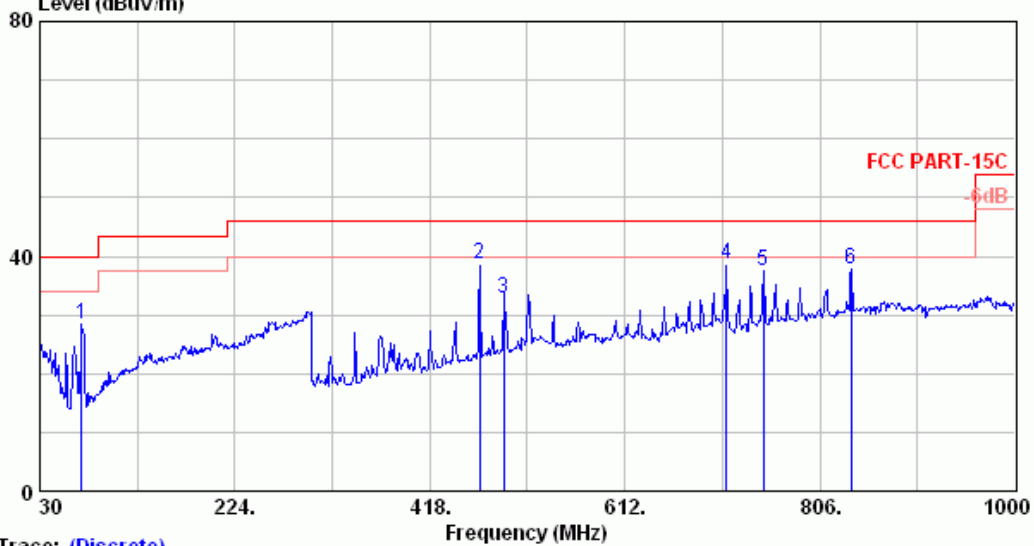
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	369.500	16.93	4.60	14.47	36.00	46.00	10.00	
2	382.110	17.29	4.60	11.17	33.06	46.00	12.94	
3	418.000	16.93	5.04	13.79	35.76	46.00	10.24	
4	467.470	18.21	5.80	12.09	36.10	46.00	9.90	
5	491.720	18.61	6.33	8.48	33.42	46.00	12.58	
6	700.270	23.46	6.50	6.47	36.43	46.00	9.57	
7	785.630	23.83	6.90	7.11	37.84	46.00	8.16	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 7 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Side(CH02)

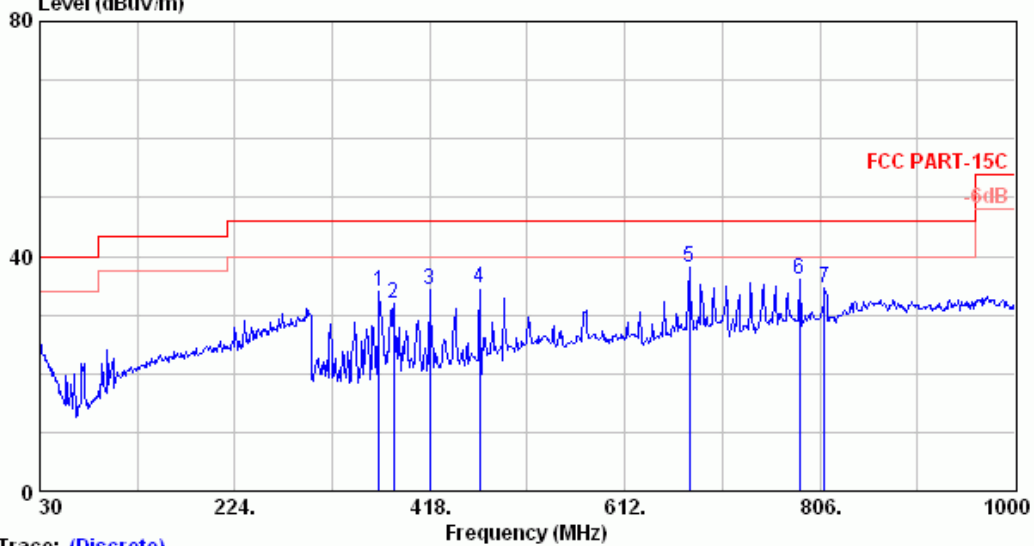
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	71.710	12.26	1.80	14.39	28.46	40.00	11.54	
2	467.470	18.21	5.80	14.60	38.61	46.00	7.39	
3	491.720	18.61	6.33	7.95	32.89	46.00	13.11	
4	712.880	23.30	6.53	8.95	38.78	46.00	7.22	
5	749.740	23.25	6.70	7.63	37.58	46.00	8.42	
6	837.040	24.94	7.10	5.87	37.90	46.00	8.10	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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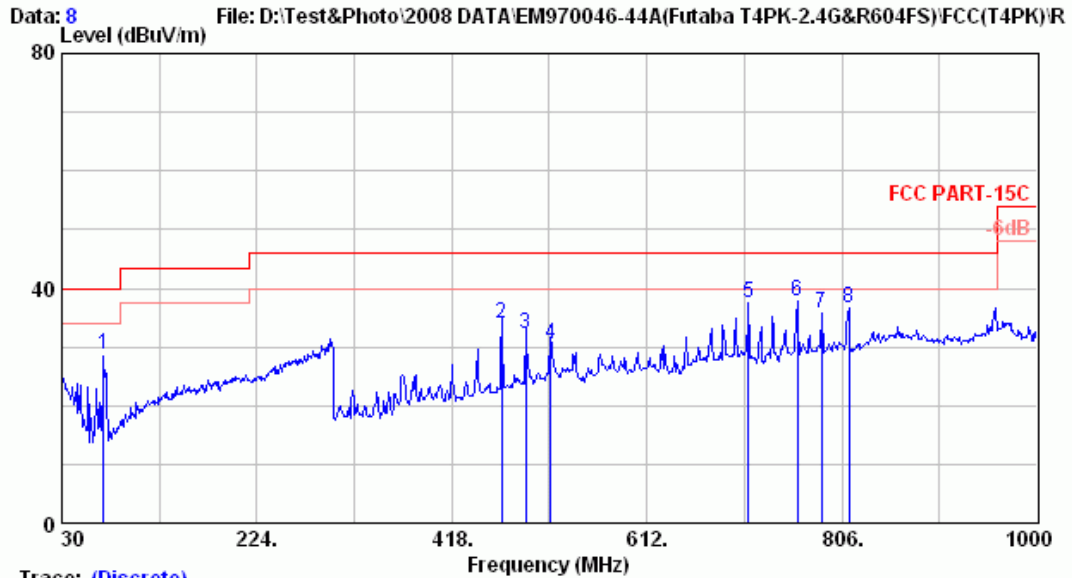
Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Lying (CH02)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	367.560	16.83	4.46	12.81	34.10	46.00	11.90	
2	382.110	17.29	4.60	10.05	31.94	46.00	14.06	
3	418.000	16.93	5.04	12.32	34.29	46.00	11.71	
4	467.470	18.21	5.80	10.50	34.51	46.00	11.49	
5	676.020	22.89	6.40	8.94	38.22	46.00	7.78	
6	785.630	23.83	6.90	5.35	36.08	46.00	9.92	
7	810.850	24.09	7.00	3.39	34.48	46.00	11.52	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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 Email:ttemc@ttemc.



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 8
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Lying (CH02)

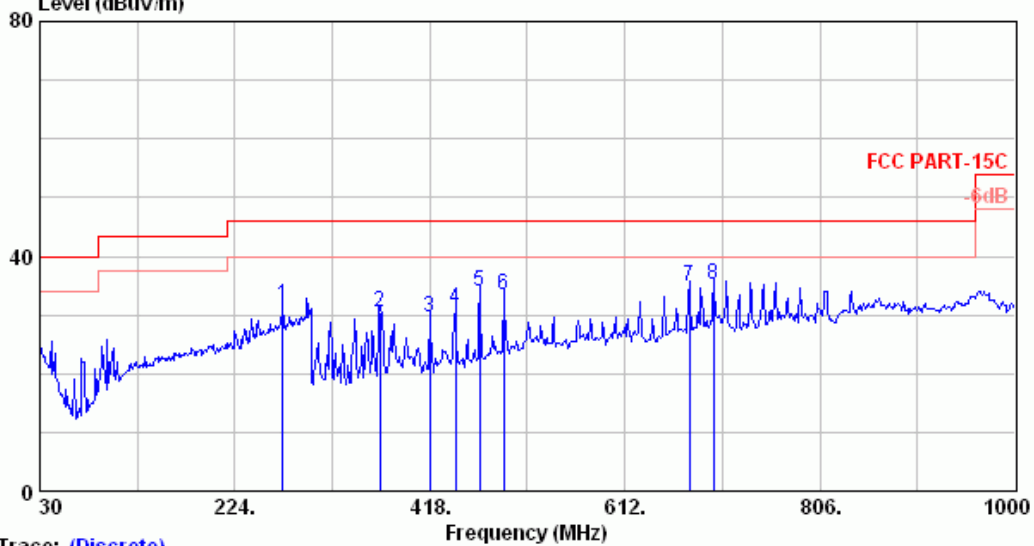
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	71.710	12.26	1.80	14.60	28.67	40.00	11.33	
2	467.470	18.21	5.80	9.90	33.91	46.00	12.09	
3	491.720	18.61	6.33	7.40	32.34	46.00	13.66	
4	515.970	19.98	6.80	3.72	30.50	46.00	15.50	
5	712.880	23.30	6.53	7.72	37.55	46.00	8.45	
6	761.380	23.68	6.70	7.54	37.92	46.00	8.08	
7	785.630	23.83	6.90	4.92	35.65	46.00	10.35	
8	812.790	24.02	7.00	5.54	36.56	46.00	9.44	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 9 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 9
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH38)

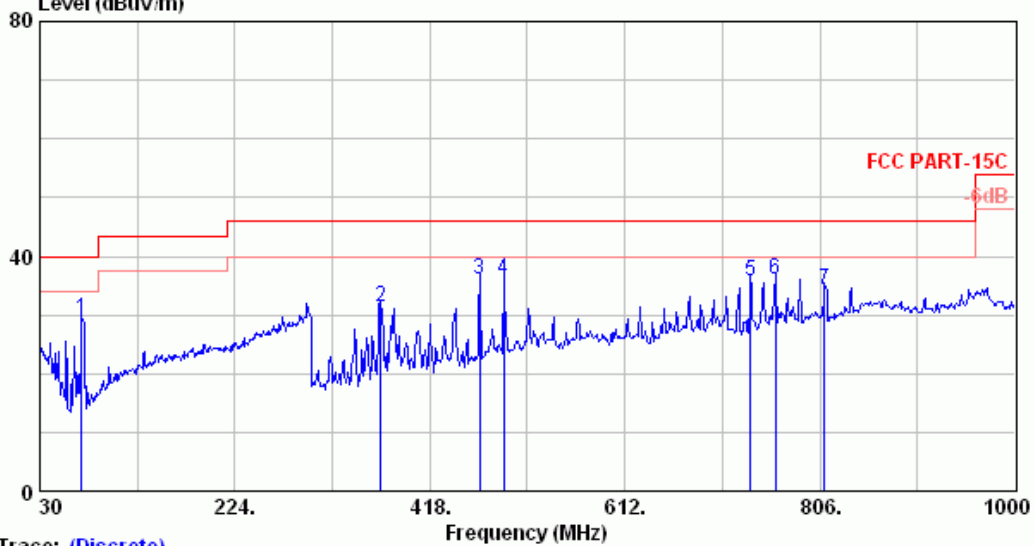
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	271.530	25.06	3.70	2.87	31.63	46.00	14.37	
2	368.530	16.88	4.60	9.11	30.59	46.00	15.41	
3	418.000	16.93	5.04	7.71	29.68	46.00	16.32	
4	443.220	17.62	5.33	7.99	30.94	46.00	15.06	
5	467.470	18.21	5.80	10.09	34.10	46.00	11.90	
6	491.720	18.61	6.33	8.48	33.42	46.00	12.58	
7	676.020	22.89	6.40	5.57	34.85	46.00	11.15	
8	700.270	23.46	6.50	5.24	35.20	46.00	10.80	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 10 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 10
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH38)

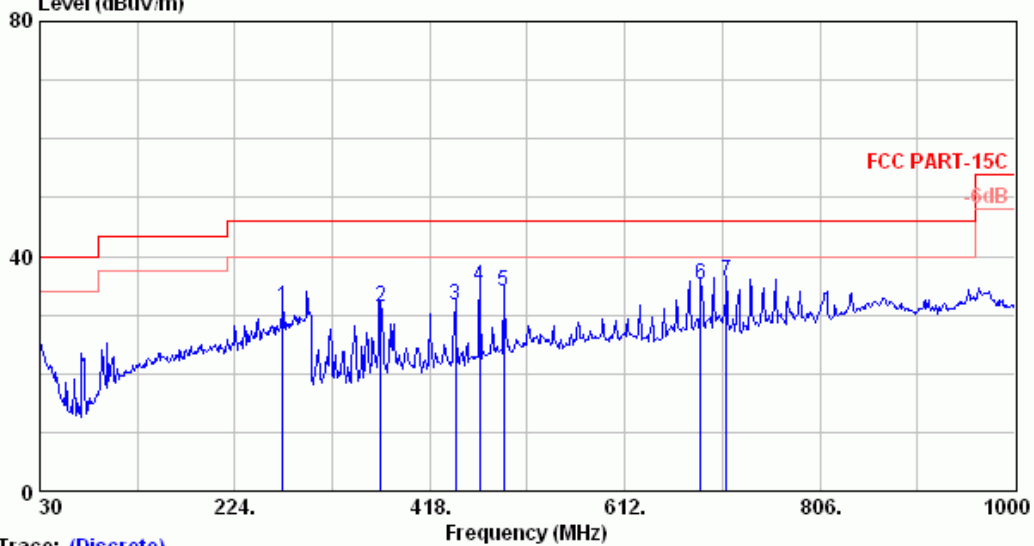
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	71.710	12.26	1.80	15.19	29.26	40.00	10.74	
2	369.500	16.93	4.60	9.76	31.29	46.00	14.71	
3	467.470	18.21	5.80	12.03	36.04	46.00	9.96	
4	491.720	18.61	6.33	11.18	36.12	46.00	9.88	
5	737.130	22.23	6.60	7.02	35.86	46.00	10.14	
6	761.380	23.68	6.70	5.58	35.96	46.00	10.04	
7	810.850	24.09	7.00	3.30	34.39	46.00	11.61	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 10 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 10
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH72)

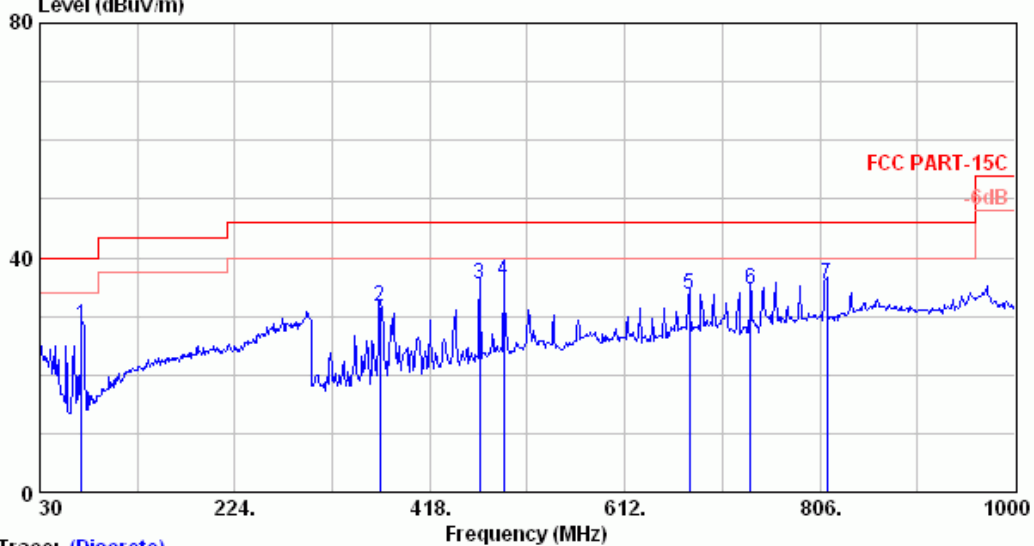
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	271.530	25.06	3.70	2.73	31.49	46.00	14.51	
2	369.500	16.93	4.60	9.86	31.39	46.00	14.61	
3	443.220	17.62	5.33	8.78	31.73	46.00	14.27	
4	467.470	18.21	5.80	10.72	34.73	46.00	11.27	
5	491.720	18.61	6.33	8.91	33.85	46.00	12.15	
6	687.660	23.26	6.50	5.47	35.23	46.00	10.77	
7	712.880	23.30	6.53	5.92	35.75	46.00	10.25	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 9 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

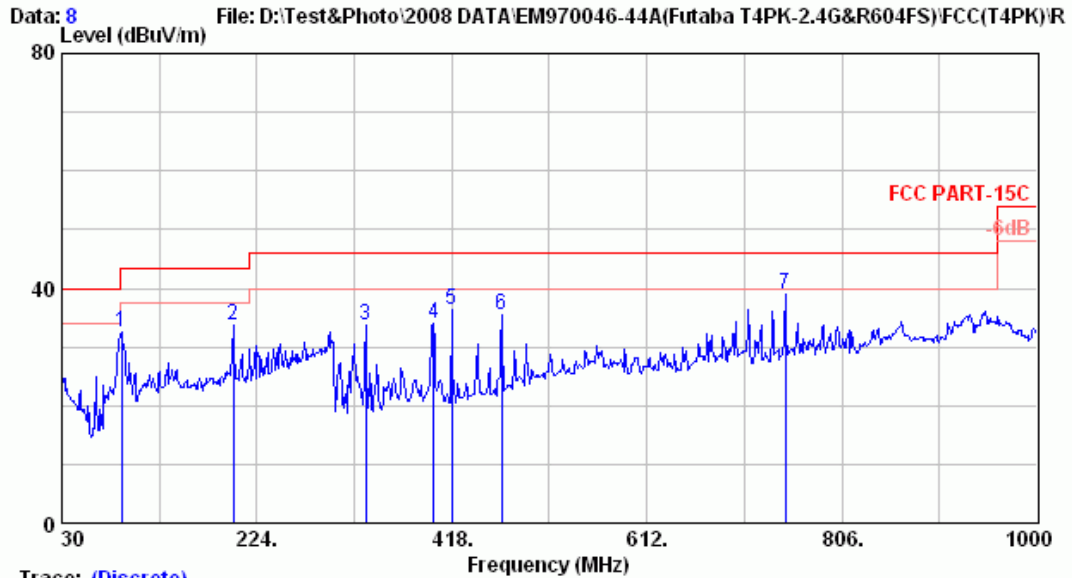
Site no. : A/C Chamber Data no. : 9
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21+C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : Stand(CH72)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	71.710	12.26	1.80	14.29	28.36	40.00	11.64	
2	368.530	16.88	4.60	10.25	31.74	46.00	14.26	
3	467.470	18.21	5.80	11.41	35.42	46.00	10.58	
4	491.720	18.61	6.33	11.13	36.07	46.00	9.93	
5	676.020	22.89	6.40	4.49	33.77	46.00	12.23	
6	737.130	22.23	6.60	5.78	34.62	46.00	11.38	
7	812.790	24.02	7.00	4.55	35.57	46.00	10.43	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Trace: (Discrete)

Site no. : A/C Chamber Data no. : 8
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : RX Mode

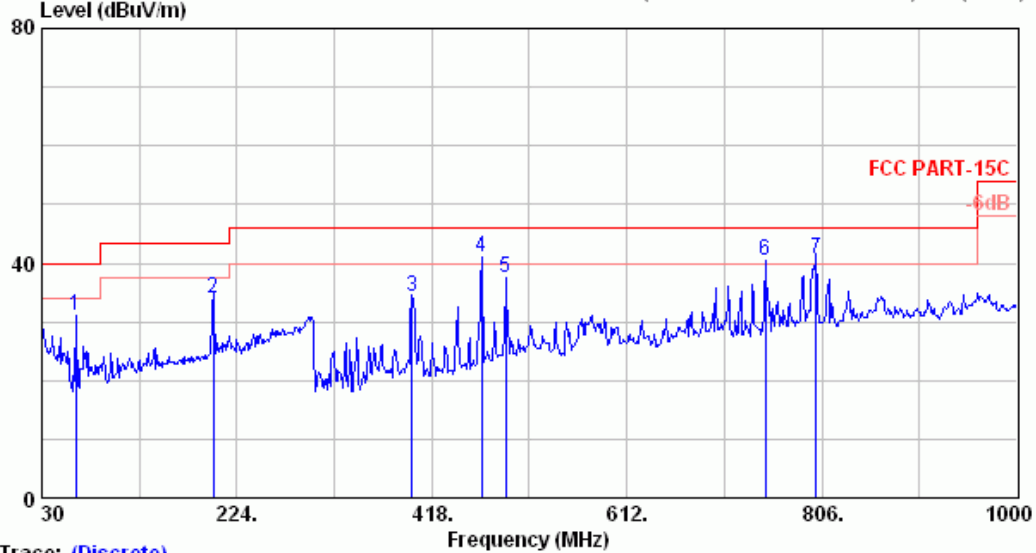
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	89.170	15.57	2.00	14.94	32.51	43.50	10.99	
2	200.720	22.08	3.00	8.65	33.73	43.50	9.77	
3	332.640	15.21	4.20	14.37	33.78	46.00	12.22	
4	399.570	17.69	4.80	11.63	34.11	46.00	11.89	
5	418.000	16.93	5.04	14.42	36.39	46.00	9.61	
6	467.470	18.21	5.80	11.46	35.47	46.00	10.53	
7	749.740	23.25	6.70	9.01	38.96	46.00	7.04	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Data: 7 File: D:\Test&Photo\2008 DATA\EM970046-44A(Futaba T4PK-2.4G&R604FS)\FCC(T4PK)R



Trace: (Discrete)

Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
 Limit : FCC PART-15C
 Env. / Ins. : ESCS30 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : RX Mode

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	63.950	11.90	1.67	17.56	31.13	40.00	8.87	
2	200.720	22.08	3.00	8.87	33.95	43.50	9.55	
3	398.600	17.67	4.80	11.87	34.34	46.00	11.66	
4	467.470	18.21	5.80	16.99	41.00	46.00	5.00	
5	491.720	18.61	6.33	12.58	37.52	46.00	8.48	
6	749.740	23.25	6.70	10.52	40.47	46.00	5.53	
7	800.180	24.14	6.90	9.60	40.63	46.00	5.37	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

3.6.2. Frequency Range Above 1GHz Measurement Results

Date of Test : Jan. 18, 2008 Temperature : 21

EUT : Radio Control Humidity : 60%

Test Mode : Transmitting, Channel: 02 (Frequency: 2405.376MHz), Attitude: Stand

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	14.10	43.95	74.00	30.05	Peak
2	1465.360	25.39	5.33	12.33	43.04	74.00	30.96	Peak
3	1603.120	25.95	6.18	12.28	44.40	74.00	29.60	Peak
4	2249.920	28.33	6.17	9.29	43.79	74.00	30.21	Peak
5	2409.520	28.63	6.36	10.84	45.83	74.00	28.17	Peak
6	2545.600	28.99	6.54	9.63	45.16	74.00	28.84	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	13.10	42.95	74.00	31.05	Peak
2	1465.360	25.39	5.33	11.33	42.04	74.00	31.96	Peak
3	1603.120	25.95	6.18	10.28	42.40	74.00	31.60	Peak
4	2335.600	28.49	6.27	9.07	43.83	74.00	30.17	Peak
5	2409.520	28.63	6.36	9.84	44.83	74.00	29.17	Peak
6	2548.960	29.02	6.54	7.63	43.20	74.00	30.80	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	8.10	37.95	54.00	16.05	Average
2	1465.360	25.39	5.33	5.33	36.04	54.00	17.96	Average
3	1603.120	25.95	6.18	6.28	38.40	54.00	15.60	Average
4	2249.920	28.33	6.17	5.29	39.79	54.00	14.21	Average
5	2409.520	28.63	6.36	5.84	40.83	54.00	13.17	Average
6	2545.600	28.99	6.54	4.63	40.16	54.00	13.84	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	7.10	36.95	54.00	17.05	Average
2	1465.360	25.39	5.33	5.33	36.04	54.00	17.96	Average
3	1603.120	25.95	6.18	5.28	37.40	54.00	16.60	Average
4	2335.600	28.49	6.27	4.07	38.83	54.00	15.17	Average
5	2409.520	28.63	6.36	4.84	39.83	54.00	14.17	Average
6	2548.960	29.02	6.54	4.63	40.20	54.00	13.80	Average

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmitting, Channel: 02 (Frequency: 2405.376MHz), Attitude: Side

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1188.160	25.29	4.56	12.83	42.68	74.00	31.32	Peak
2	1603.120	25.95	6.18	12.98	45.10	74.00	28.90	Peak
3	2224.720	28.28	6.14	8.65	43.07	74.00	30.93	Peak
4	2619.520	29.31	6.66	8.51	44.47	74.00	29.53	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1188.160	25.29	4.56	12.79	42.64	74.00	31.36	Peak
2	1336.000	25.34	4.95	11.41	41.71	74.00	32.29	Peak
3	1729.120	26.58	7.04	8.49	42.10	74.00	31.90	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1188.160	25.29	4.56	6.82	36.68	54.00	17.32	Average
2	1603.120	25.95	6.18	7.98	40.10	54.00	13.90	Average
3	2224.720	28.28	6.14	5.65	40.07	54.00	13.93	Average
4	2619.520	29.31	6.66	3.51	39.47	54.00	14.53	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1188.160	25.29	4.56	6.78	36.64	54.00	17.36	Average
2	1336.000	25.34	4.95	5.41	35.71	54.00	18.29	Average
3	1729.120	26.58	7.04	4.49	38.10	54.00	15.90	Average

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmitting, Channel: 02 (Frequency: 2405.376MHz), Attitude: Lying

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	13.57	43.42	74.00	30.58	Peak
2	1603.120	25.95	6.18	7.45	39.57	74.00	34.43	Peak
3	2249.920	28.33	6.17	8.25	42.75	74.00	31.25	Peak
4	2569.120	29.09	6.58	9.79	45.45	74.00	28.55	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	10.93	40.78	74.00	33.22	Peak
2	1381.360	25.36	5.08	11.09	41.53	74.00	32.47	Peak
3	1603.120	25.95	6.18	11.61	43.73	74.00	30.27	Peak
4	1734.160	26.60	7.07	7.31	40.98	74.00	33.02	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	6.57	36.42	54.00	17.58	Average
2	1603.120	25.95	6.18	2.45	34.57	54.00	19.43	Average
3	2249.920	28.33	6.17	3.25	37.75	54.00	16.25	Average
4	2569.120	29.09	6.58	4.79	40.45	54.00	13.55	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	5.93	35.78	54.00	18.22	Average
2	1381.360	25.36	5.08	6.09	36.53	54.00	17.47	Average
3	1603.120	25.95	6.18	6.61	38.73	54.00	15.27	Average
4	1734.160	26.60	7.07	3.31	36.98	54.00	17.02	Average

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmitting, Channel: 38 (Frequency: 2442.240MHz), Attitude: Stand

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	16.44	46.31	74.00	27.69	Peak
2	1628.320	26.10	6.36	11.17	43.63	74.00	30.37	Peak
3	1725.760	26.58	7.00	9.23	42.81	74.00	31.19	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	20.28	50.13	74.00	23.87	Peak
2	1330.960	25.34	4.93	13.27	43.54	74.00	30.46	Peak
3	1628.320	26.10	6.36	14.79	47.25	74.00	26.75	Peak
4	2263.360	28.36	6.18	13.17	47.71	74.00	26.29	Peak
5	2632.960	29.37	6.68	14.33	50.38	74.00	23.62	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	8.44	38.31	54.00	15.69	Average
2	1628.320	26.10	6.36	3.17	35.63	54.00	18.37	Average
3	1725.760	26.58	7.00	1.23	34.81	54.00	19.19	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	12.28	42.13	54.00	11.87	Average
2	1330.960	25.34	4.93	5.27	35.54	54.00	18.46	Average
3	1628.320	26.10	6.36	6.79	39.25	54.00	14.75	Average
4	2263.360	28.36	6.18	6.17	40.71	54.00	13.29	Average
5	2632.960	29.37	6.68	6.33	42.38	54.00	11.62	Average

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmitting, Channel: 72 (Frequency: 2479.104MHz), Attitude: Stand

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	15.81	45.68	74.00	28.32	Peak
2	1653.520	26.22	6.52	15.33	48.07	74.00	25.93	Peak
3	1729.120	26.58	7.04	9.05	42.66	74.00	31.34	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	19.35	49.22	74.00	24.78	Peak
2	1653.520	26.22	6.52	19.65	52.39	74.00	21.61	Peak
3	1729.120	26.58	7.04	10.75	44.36	74.00	29.64	Peak
4	2300.320	28.42	6.23	13.35	48.01	74.00	25.99	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	7.81	37.68	54.00	16.32	Average
2	1653.520	26.22	6.52	7.33	40.07	54.00	13.93	Average
3	1729.120	26.58	7.04	1.05	34.66	54.00	19.34	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	1196.560	25.29	4.58	11.35	41.22	54.00	12.78	Average
2	1653.520	26.22	6.52	11.65	44.39	54.00	9.61	Average
3	1729.120	26.58	7.04	2.75	36.36	54.00	17.64	Average
4	2300.320	28.42	6.23	6.35	41.01	54.00	12.99	Average

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

Date of Test : Jan. 18, 2008 Temperature : 21

EUT : Radio Control Humidity : 60%

Test Mode : Receiving, Channel: 38 (Frequency: 2442.240MHz), Attitude: Stand

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	15.68	45.53	74.00	28.47	Peak
2	1394.800	25.36	5.12	10.81	41.30	74.00	32.70	Peak
3	1460.320	25.39	5.31	10.88	41.58	74.00	32.42	Peak

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	15.91	45.76	74.00	28.24	Peak
2	1325.920	25.34	4.91	13.47	43.72	74.00	30.28	Peak
3	1389.760	25.36	5.11	14.17	44.65	74.00	29.35	Peak
4	1456.960	25.39	5.31	13.24	43.94	74.00	30.06	Peak
5	1665.280	26.26	6.60	11.09	43.95	74.00	30.05	Peak

Horizontal

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	9.68	39.53	54.00	14.47	Average
2	1394.800	25.36	5.12	6.81	37.30	54.00	16.70	Average
3	1460.320	25.39	5.31	4.88	35.58	54.00	18.42	Average

Vertical

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1191.520	25.29	4.56	8.91	38.76	54.00	15.24	Average
2	1325.920	25.34	4.91	7.47	37.72	54.00	16.28	Average
3	1389.760	25.36	5.11	7.17	37.65	54.00	16.35	Average
4	1456.960	25.39	5.31	6.24	36.94	54.00	17.06	Average
5	1665.280	26.26	6.60	5.09	37.95	54.00	16.05	Average

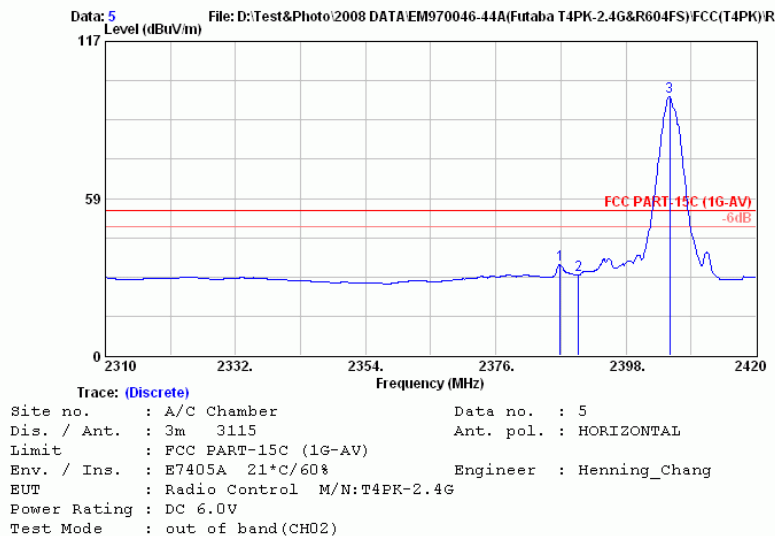
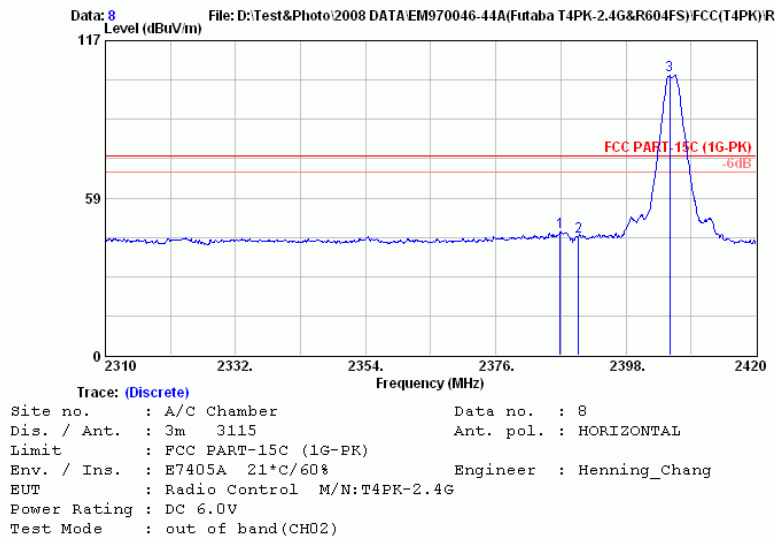
- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emission levels were too low against the official limit and not reported.

3.6.3. Restricted Bands Measurement Results

Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmitting, Channel: 02, Frequency: 2405.376MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Peak *	2386.890	28.59	6.33	11.06	45.98	74.00	28.02
Average *	2386.890	28.59	6.33	-1.06	33.86	54.00	20.14

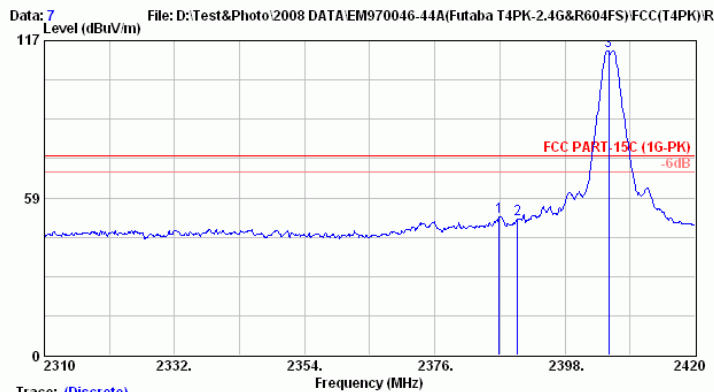
- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).
 3. ‘*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



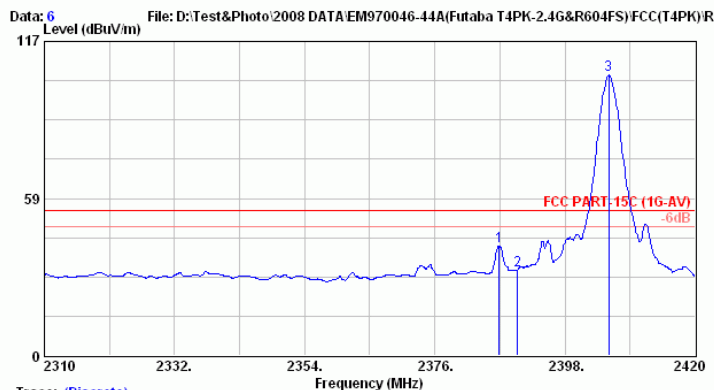
Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmit, Channel: 02, Frequency: 2405.376MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Peak *	2386.890	28.59	6.33	16.58	51.50	74.00	22.50
Average *	2386.890	28.59	6.33	5.94	40.86	54.00	13.14

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).
 3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-PK)
 Env. / Ins. : E7405A 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : out of band(CH02)



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 6
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-AV)
 Env. / Ins. : E7405A 21°C/60% Engineer : Henning_Chang
 EUT : Radio Control M/N:T4PK-2.4G
 Power Rating : DC 6.0V
 Test Mode : out of band(CH02)

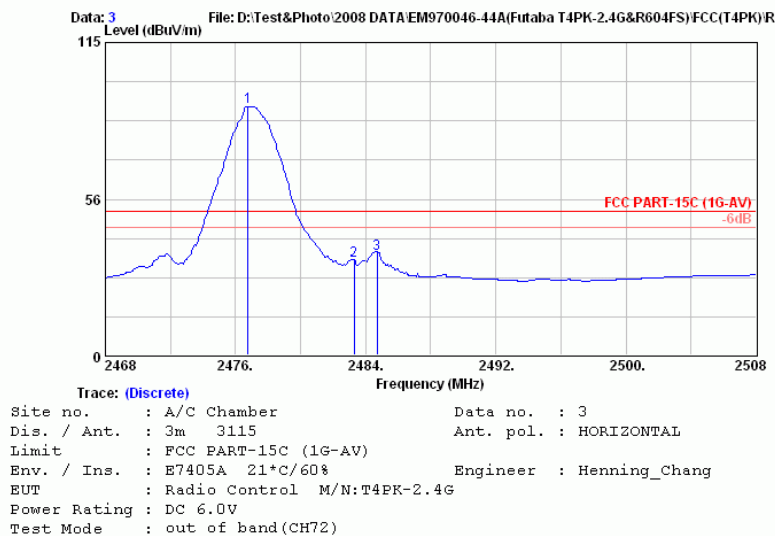
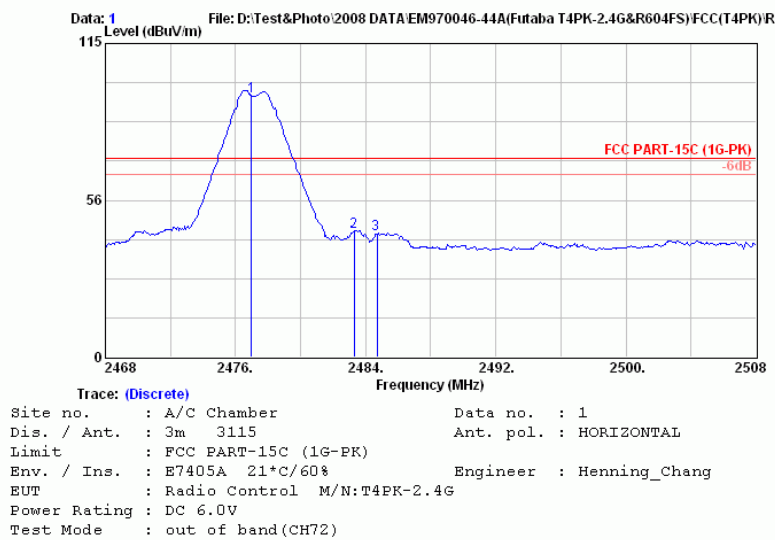
Date of Test : Jan. 18, 2008 Temperature : 21

EUT : Radio Control Humidity : 60%

Test Mode : Transmit, Channel: 72, Frequency: 2477.056MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Peak *	2485.340	28.77	6.45	10.12	45.34	74.00	28.66
Average *	2485.220	28.77	6.45	-3.16	32.06	54.00	21.94

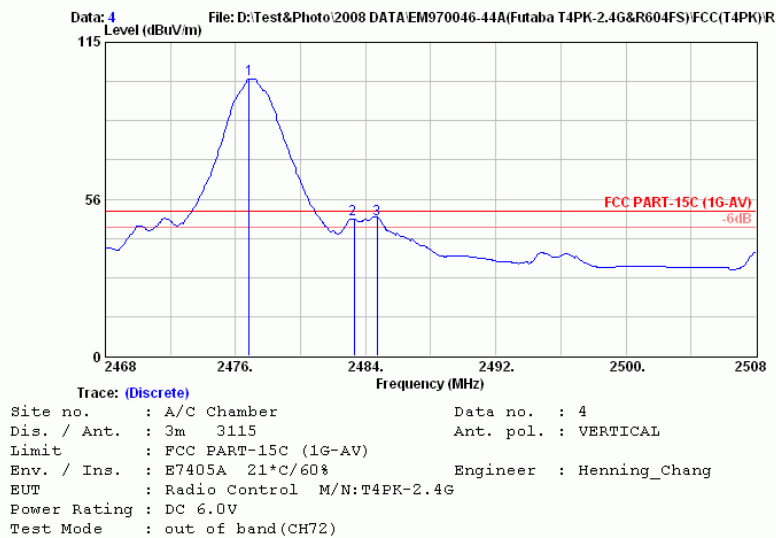
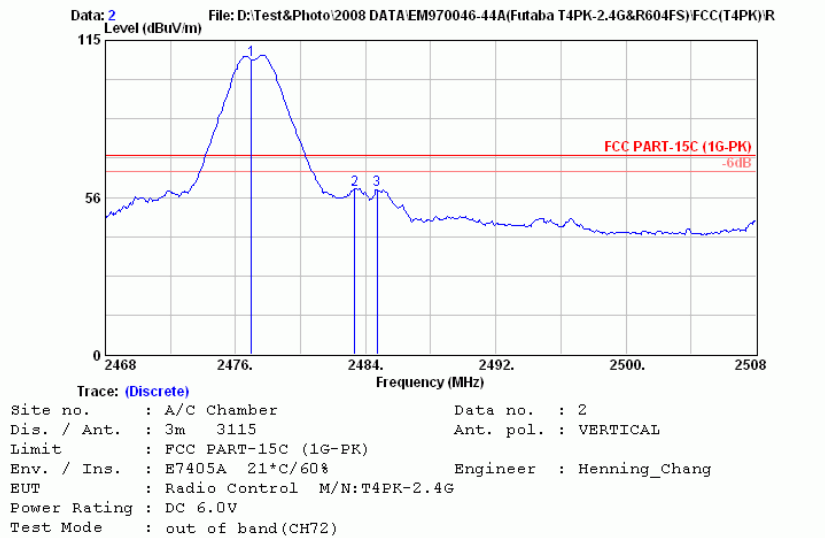
- Remark :
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. High frequency section (spurious in the restricted band 2483.5-2500MHz).
 3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



Date of Test : Jan. 18, 2008 Temperature : 21
 EUT : Radio Control Humidity : 60%
 Test Mode : Transmit, Channel: 72, Frequency: 2477.056MHz

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Peak *	2485.520	28.77	6.45	23.49	58.71	74.00	15.29
Average *	2485.220	28.77	6.45	15.94	51.16	54.00	2.84

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. High frequency section (spurious in the restricted band 2483.5-2500MHz).
 3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



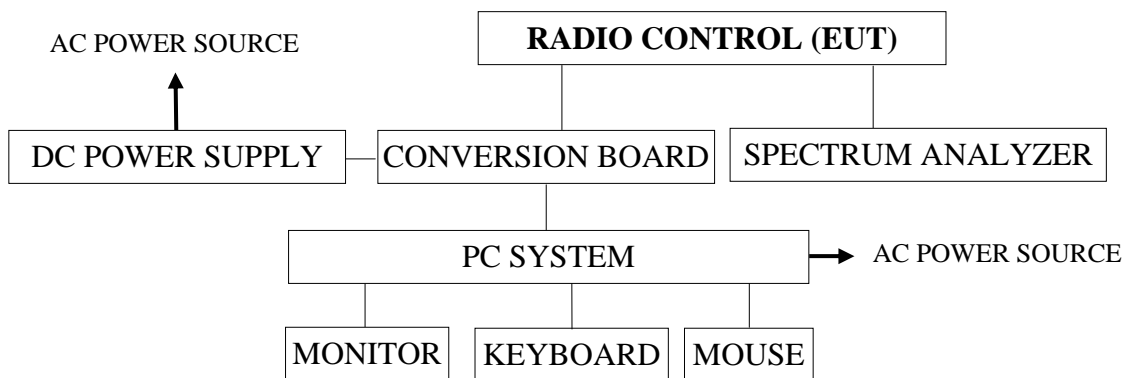
4. 6dB BANDWIDTH MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 13, 07'	Aug. 12, 08'

4.2. Block Diagram of Test Setup



4.3. Specification Limits (§15.247(a)(2))

The minimum 6dB bandwidth shall be at least 500kHz.

4.4. Operating Condition of EUT

The test program “FutabaTerm” was used to enable the EUT to transmit data at different channel frequency individually.

4.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

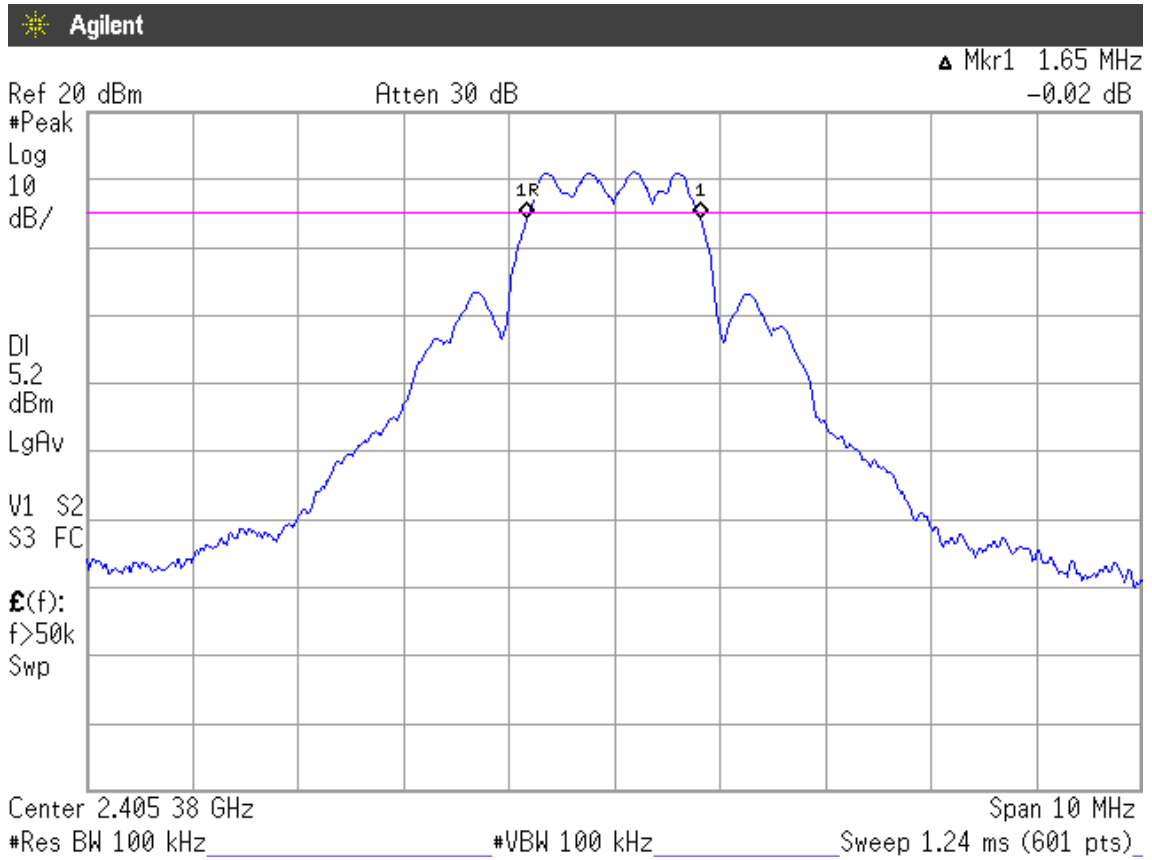
4.6. Test Results

PASSED. All the test results are attached in next pages.

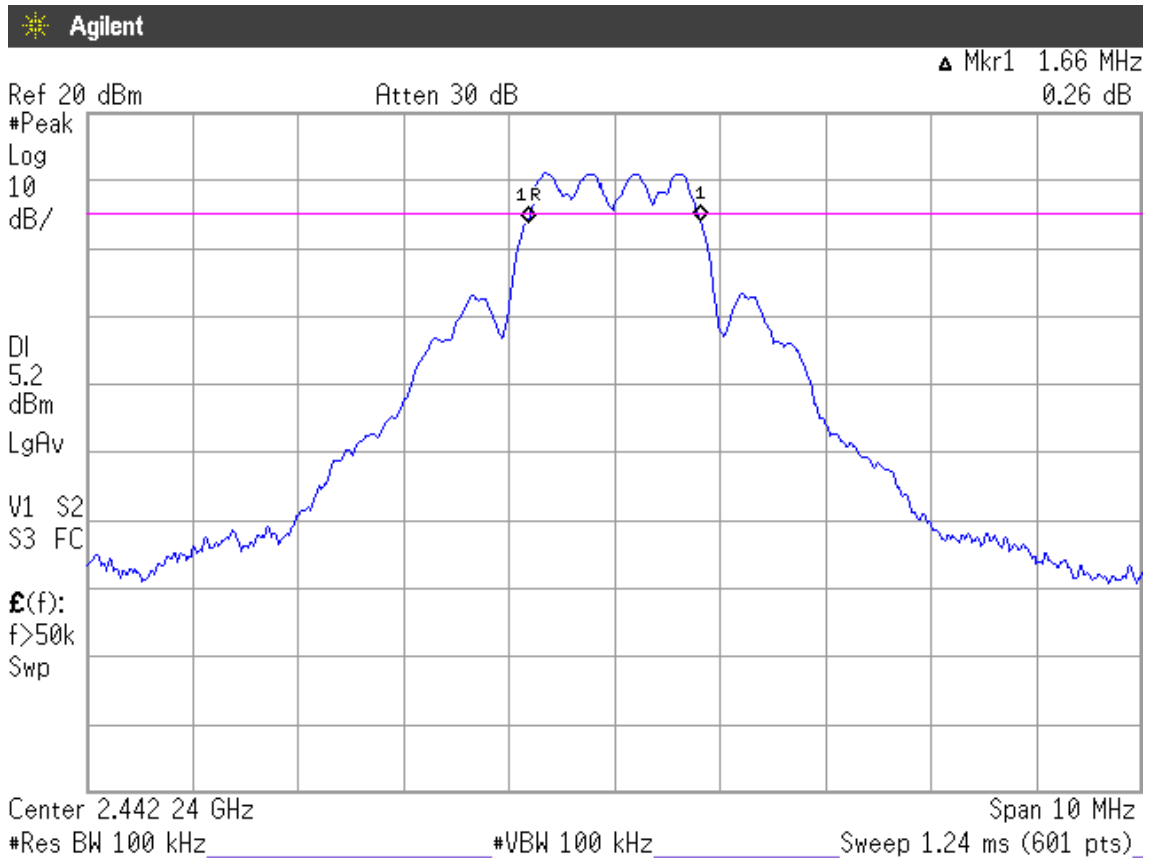
Test Date : Jan. 15, 2008 Temperature : 20 Humidity : 63 %

Channel	Frequency	6dB Bandwidth
0	2405.376MHz	1.65MHz
38	2442.240MHz	1.66MHz
72	2477.056MHz	1.63MHz

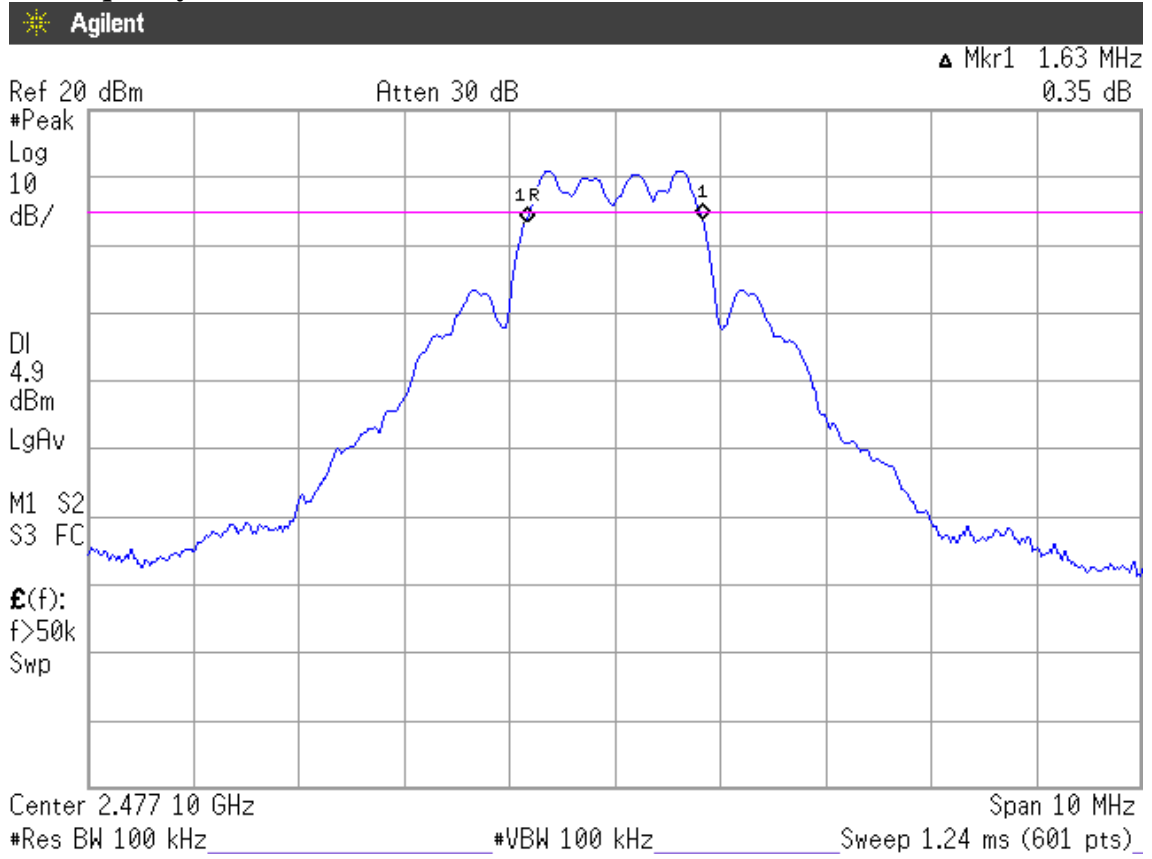
Frequency: 2405.376MHz



Frequency: 2442.240MHz



Frequency: 2477.056MHz



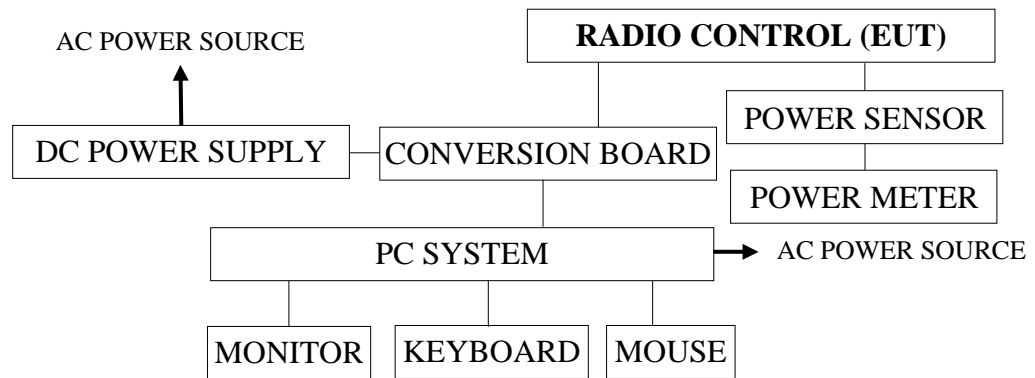
5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2487A	6K00005406	Jan. 26, 08'	Jan. 25, 09'
2.	Power Sensor	Anritsu	MA2491A	030873	Jan. 26, 08'	Jan. 25, 09'

5.2. Block Diagram of Test Setup



5.3. Specification Limits (§15.247(b)-(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm)

5.4. Operating Condition of EUT

The test program “FutabaTerm” was used to enable the EUT to transmit data at different channel frequency individually.

5.5. Test Procedure

The transmitter output was connected to the power meter that was designed to detect peak value automatically.

5.6. Test Results

PASSED. All the test results are listed below.

Test Date : Jan. 28, 2008 Temperature : 18 Humidity : 60 %

Channel	Frequency	Peak Output Power	Limit
02	2405.376MHz	17.98dBm	30dBm
38	2442.240MHz	18.35dBm	30dBm
72	2477.056MHz	18.11dBm	30dBm

6. EMISSION LIMITATIONS MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the emission limitations test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 13, 07'	Aug. 12, 08'

6.2. Block Diagram of Test Setup

The same as section.4.2.

6.3. Specification Limits (§15.247(c))

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).(This test result attaching to §3.6.3)

6.4. Operating Condition of EUT

The test program “FutabaTerm” was used to enable the EUT to transmit data at different channel frequency individually.

6.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.

6.6. Test Results

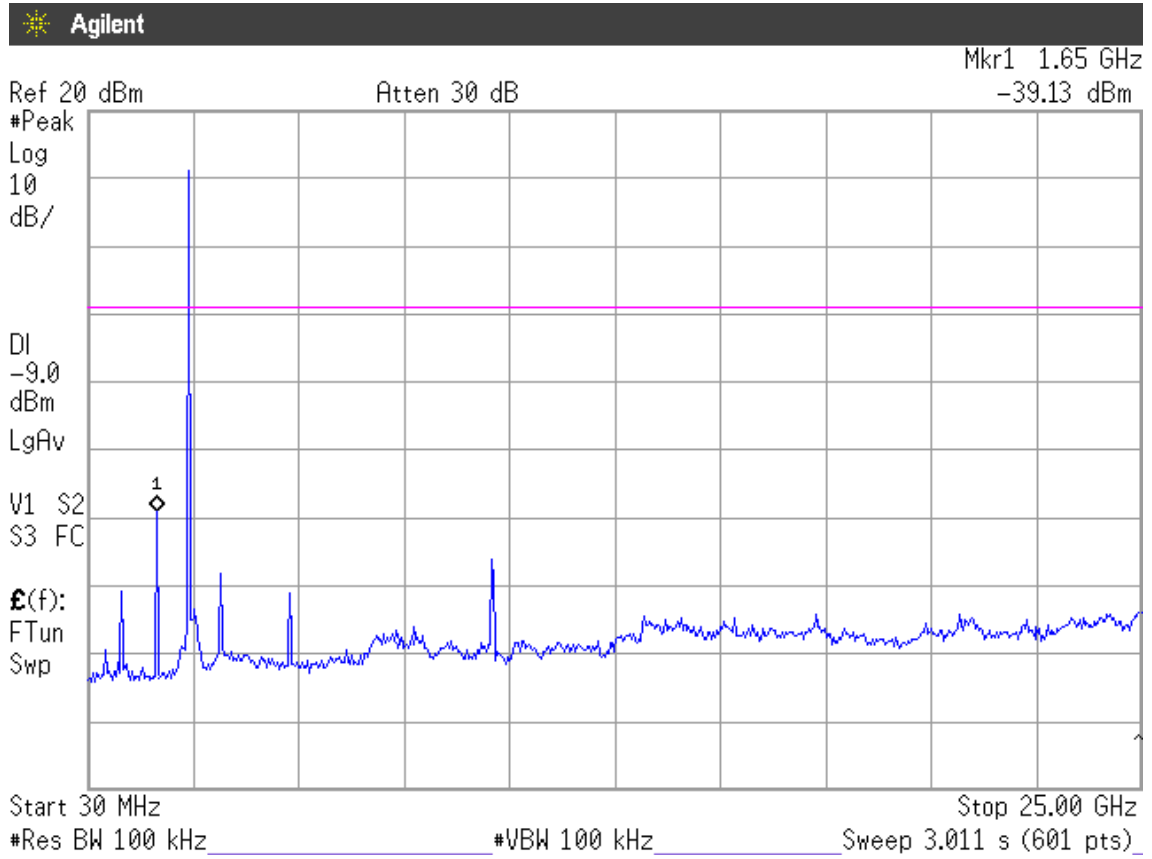
PASSED. The testing data was attached in the next pages.

Test Date : Jan. 15, 2008 Temperature : 20 Humidity : 63 %

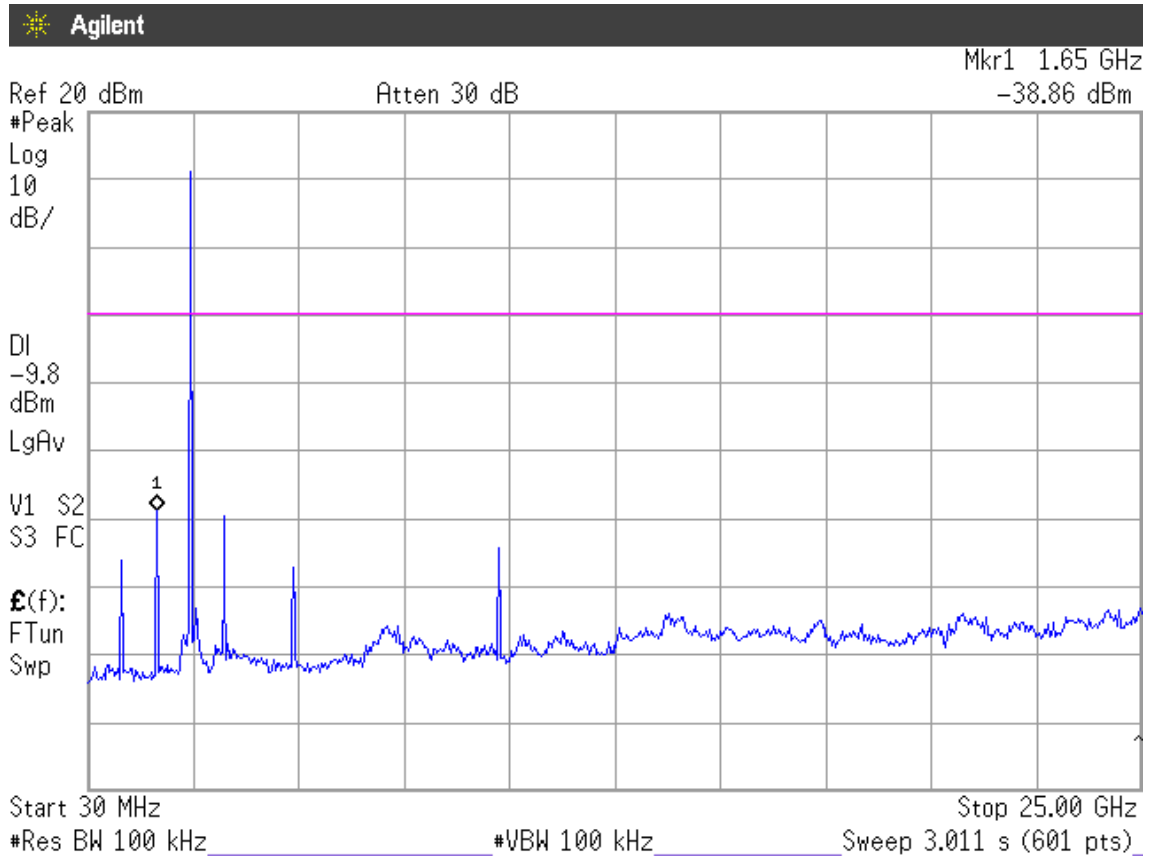
1. 2405.376MHz: During 30MHz~25GHz bandwidth. In the 1.65GHz, the -39.13dBm is max value that is lower than 20dB of primary channel.
2. 2442.240MHz: During 30MHz~25GHz bandwidth. In the 1.65GHz, the -38.86dBm is max value that is lower than 20dB of primary channel.
3. 2477.056MHz: During 30MHz~25GHz bandwidth. In the 1.63GHz, the -36.58dBm is max value that is lower than 20dB of primary channel.

Note: The peak above the limit line is the carrier frequency.

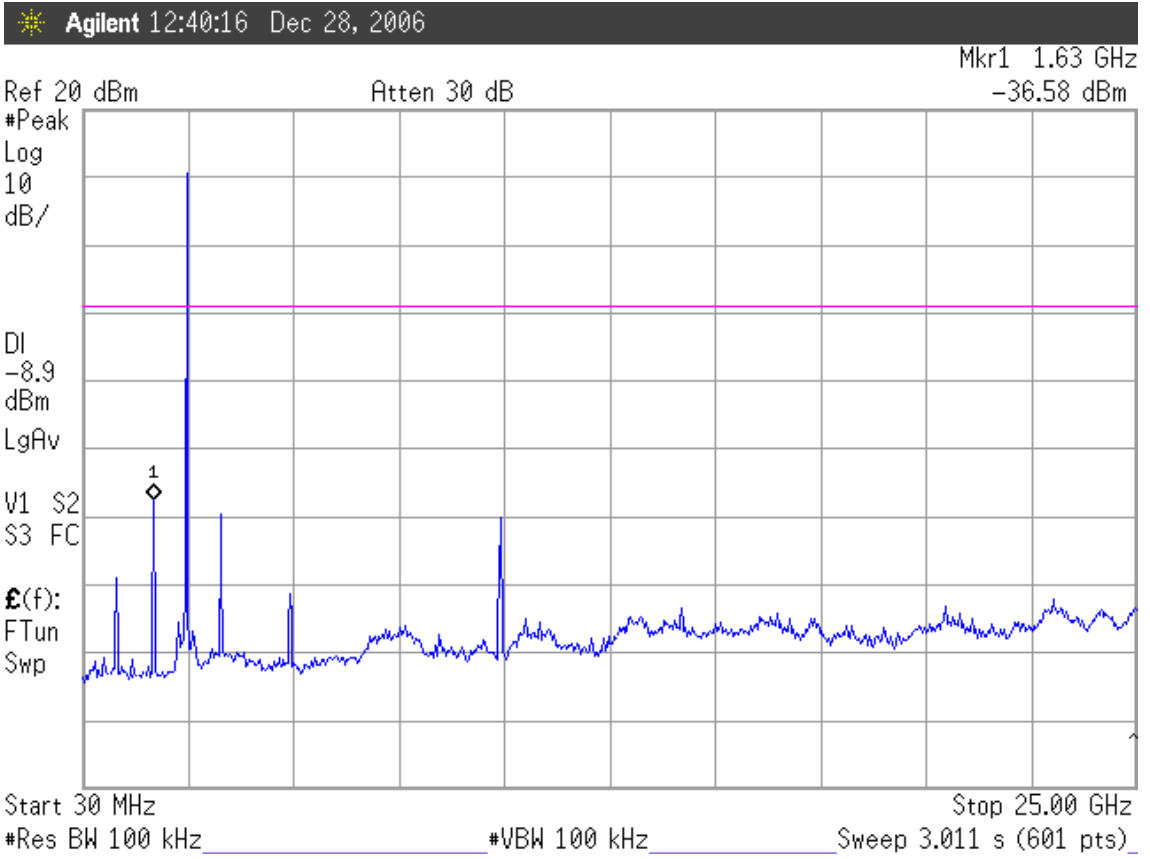
Frequency: 2405.376MHz



Frequency: 2442.240MHz



Frequency: 2477.056MHz



7. BAND EDGES MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 13, 07'	Aug. 12, 08'

7.2. Block Diagram of Test Setup

The same as section.4.2.

7.3. Specification Limits (§15.247(c))

The highest level should be at least 20 dB below that in the 100kHz bandwidth.

7.4. Operating Condition of EUT

The test program “FutabaTerm” was used to enable the EUT to transmit data at different channel frequency individually.

7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

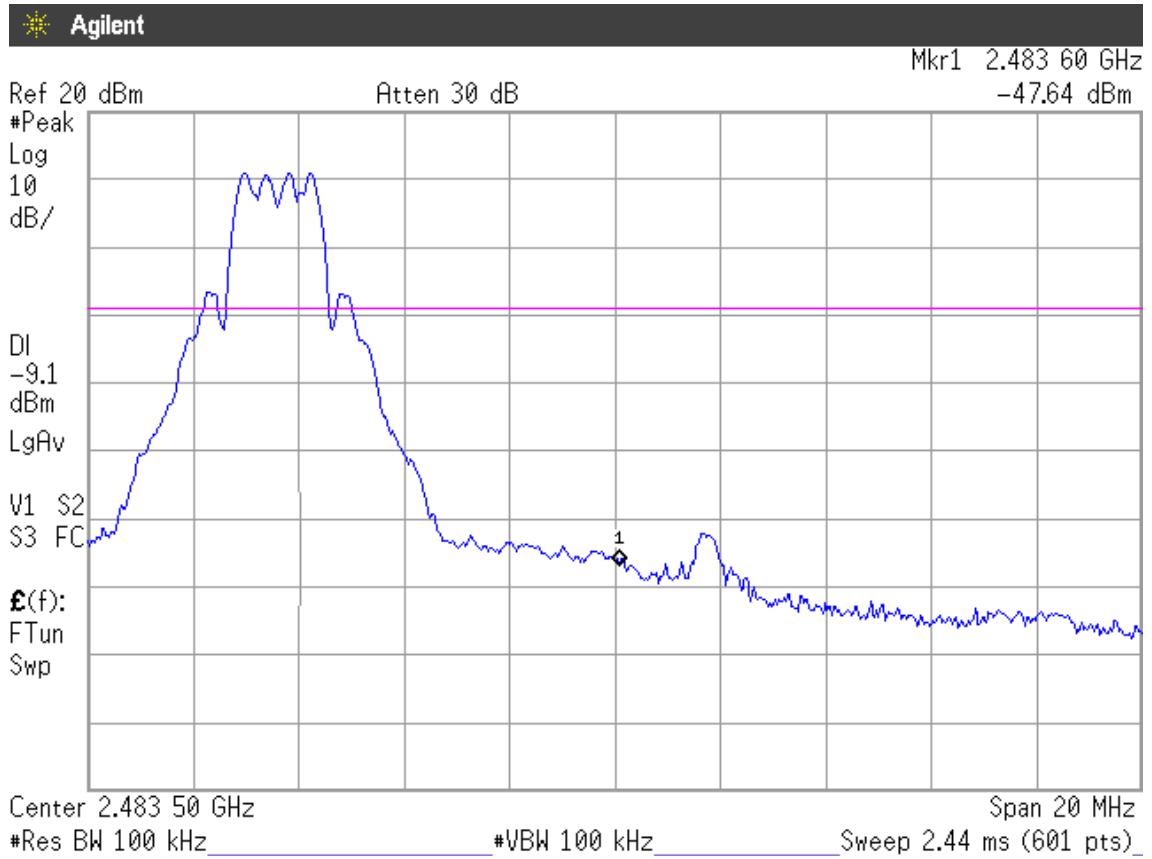
7.6. Test Results

PASSED. All the test results are attached in next pages.

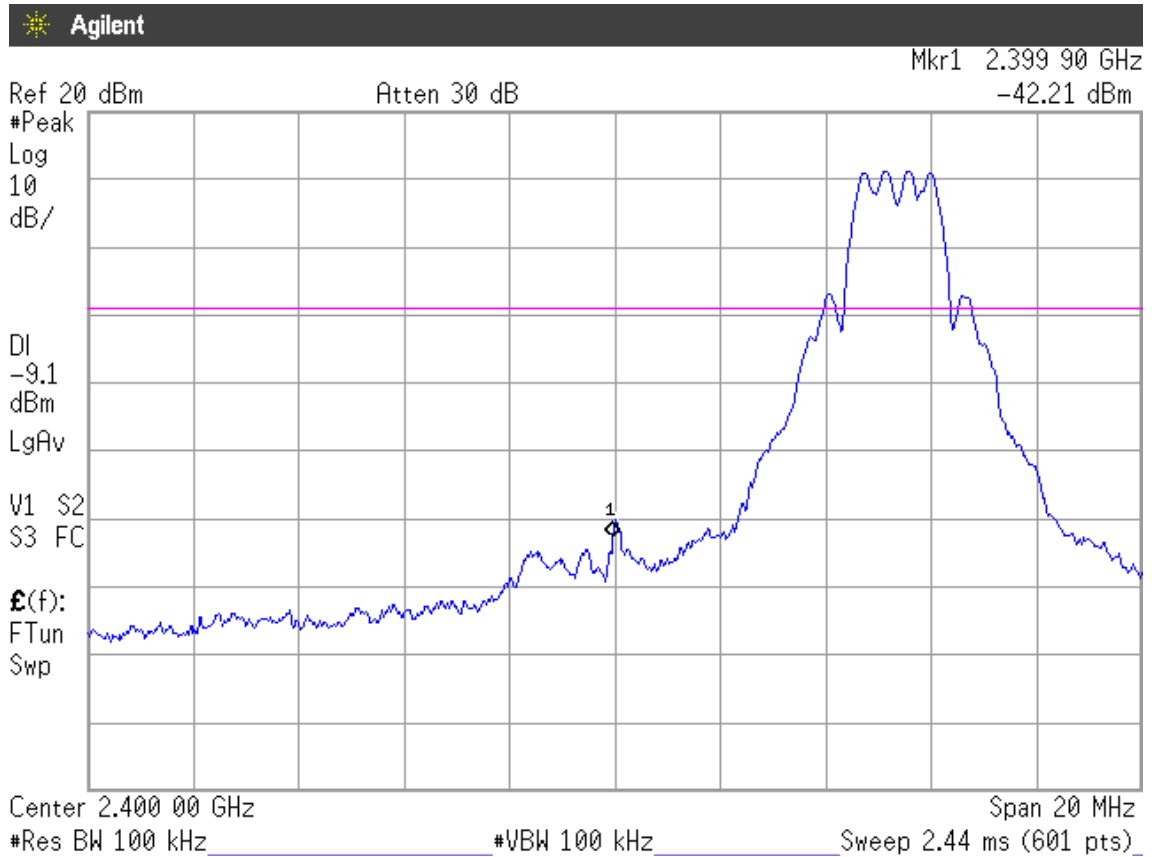
Test Date : Jan. 15, 2008 Temperature : 20 Humidity : 63 %

1. Below Band edge: The highest emission level is -47.64dBm on 2.48360GHz.
2. Upper Band edge : The highest emission level is -42.21dBm on 2.39990GHz.

Below Band edge



Upper Band edge



8. POWER SPECTRAL DENSITY MEASUREMENT

8.1. Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 13, 07'	Aug. 12, 08'

8.2. Block Diagram of Test Setup

The same as section.4.2.

8.3. Specification Limits (§15.247(d))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

8.4. Operating Condition of EUT

The test program “FutabaTerm” was used to enable the EUT to transmit data at different channel frequency individually.

8.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/300kHz.

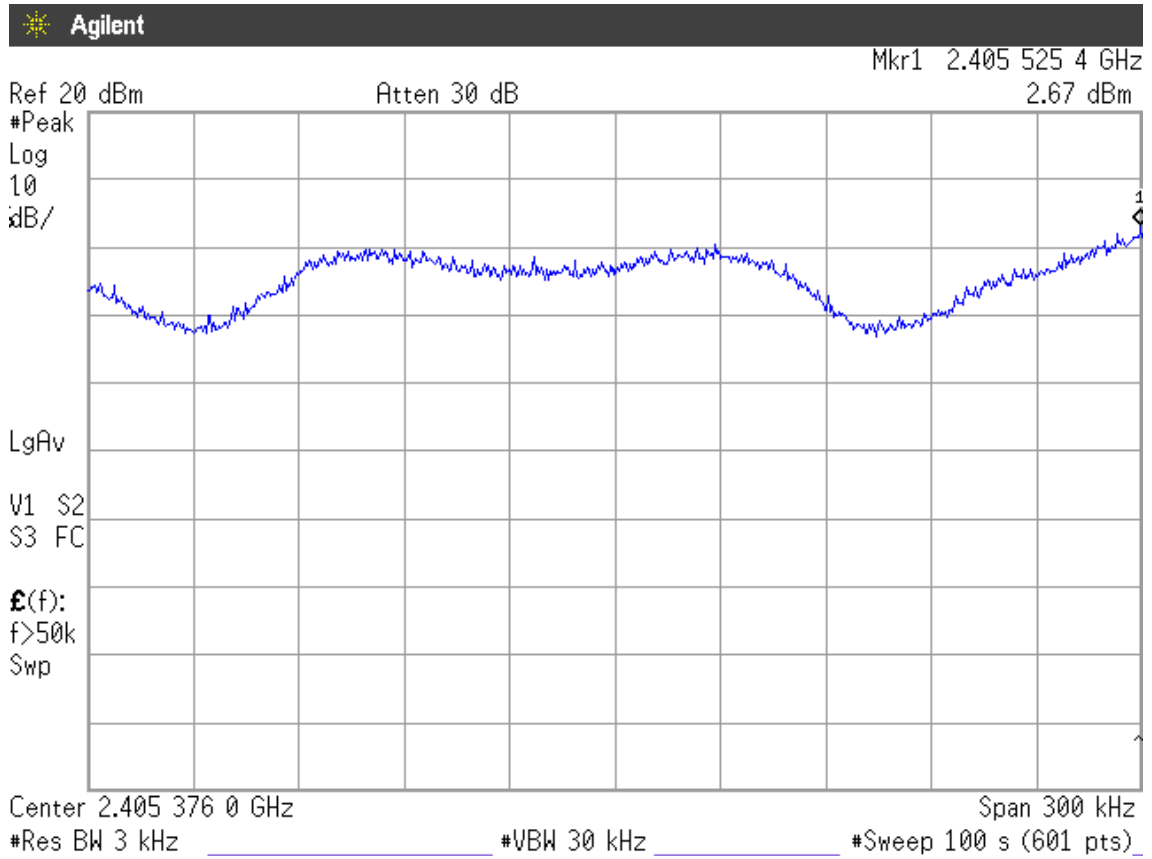
8.6. Test Results

PASSED. All the test results are attached in next pages.

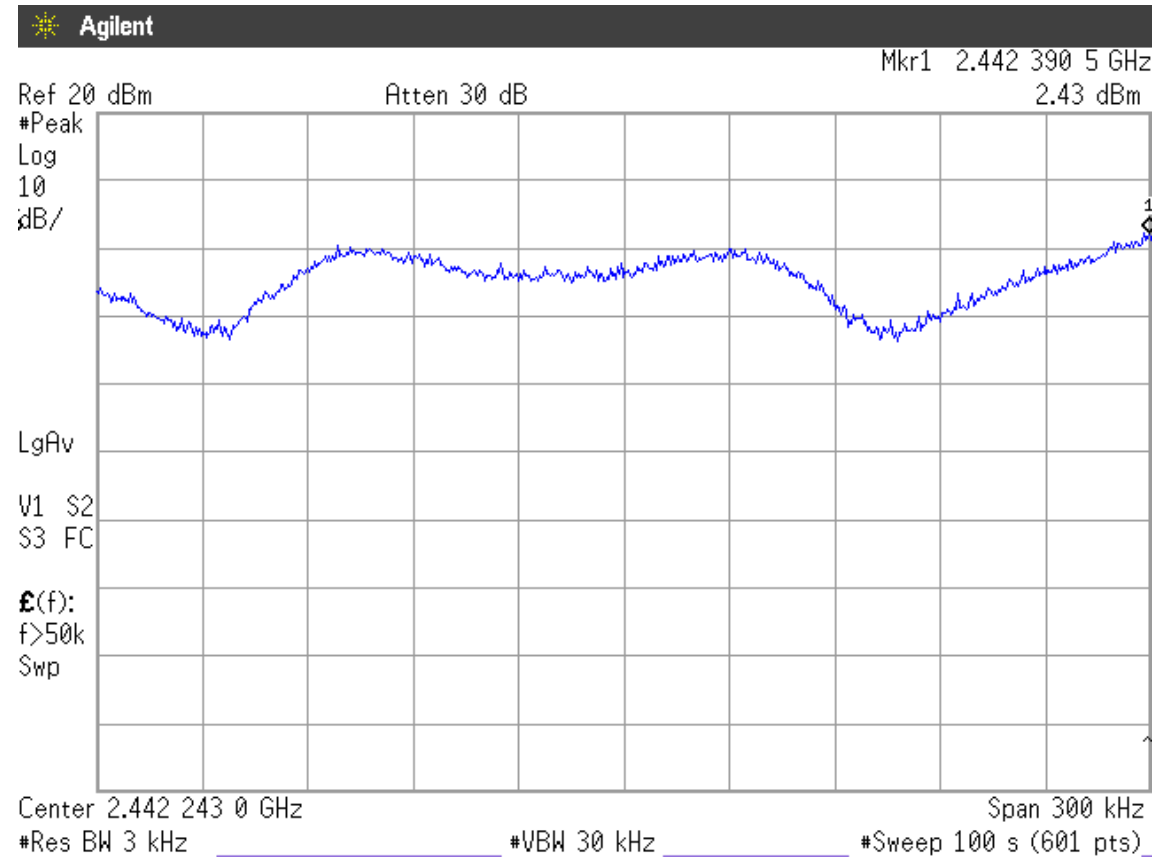
Test Date : Jan. 15, 2008 Temperature : 20 Humidity : 63 %

Channel	Frequency	Power Spectral Density	Limit
02	2405.376MHz	2.67dBm	8dBm
38	2442.240MHz	2.43dBm	8dBm
72	2477.056MHz	0.85dBm	8dBm

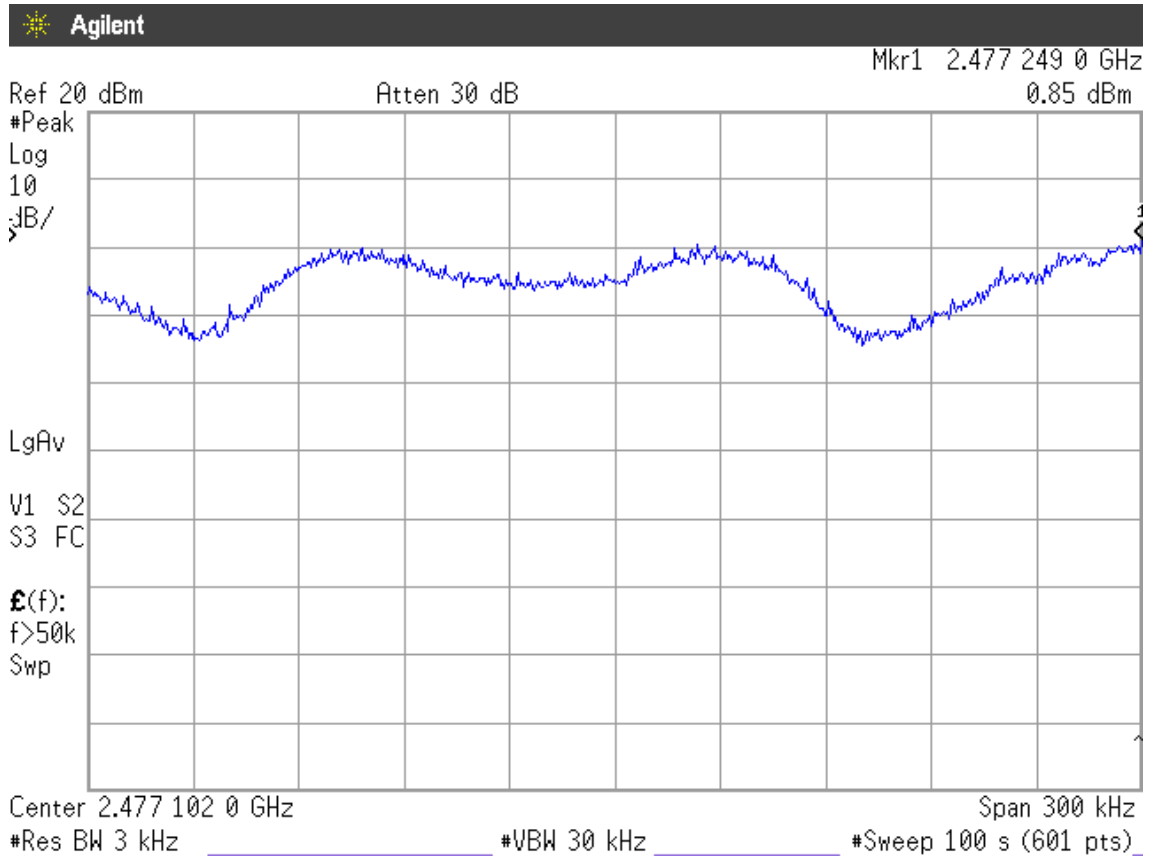
Frequency: 2405.376MHz



Frequency: 2442.240MHz



Frequency: 2477.056MHz



9. DEVIATION TO TEST SPECIFICATIONS

【NONE】