APPLICATION FOR CERTIFICATION

On Behalf of

FUTABA Corporation

Radio Control

Model No.：T18MZ

FCC ID：AZPT18MZ-24G

Brand: Futaba

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

Prepared by : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
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File Number	:	C1M1110255
Report Number	:	EM-F1000995
Date of Test	:	Nov. 17 ~ 28, 2011
Date of Report	:	Nov. 29, 2011

TABLE OF CONTENTS

TEST REPORT CERTIFICATION

Applicant	:	FUTABA Corporation
Manufacturer	:	FUTABA Corporation
EUT Description	:	Radio Control
FCC ID	:	AZPT18MZ-24G
	(A) Model No.	: T18MZ
	(B) Serial No.	: N/A
	(C) Brand	: Futaba
	(D) Power Supply	: DC 7.4V

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, Oct. 2010
AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.207 and §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 B & 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 : Nov. 17 ~ 28, 2011 Date of Report : Nov. 29, 2011

Producer : _____
(Julie Hsu/Administrator)

Signatory : _____
(Ben Cheng/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Radio Control (Transmitter)
Model Number	:	T18MZ
Serial Number	:	N/A
FCC ID	:	AZPT18MZ-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	:	FASSTest, FASST(DSSS) , S-FHSS (FHSS) Modulation The FASSTest & FASST Modulation are recorded in this report, the S-FHSS (FHSS) Modulation is recorded in another report of EM-F1000996. The difference between FASSTest and FASST is channel number. We perform all test items in FASST as covering full channels. The FASST is representative selected in this test report.
Frequency Band	:	FASSTest: 2405.376MHz ~ 2472.960MHz FASST : 2405.376MHz ~ 2477.056MHz S-FHSS (FHSS): 2403.250MHz ~ 2447.500MHz
Frequency Channel	:	FASSTest: 23 channel FASST : 36 channels S-FHSS (FHSS): 60 channels
Tested Frequency	:	FASST: 2405.376MHz (Channel 1) 2442.240MHz (Channel 19) 2477.056MHz (Channel 36)
Antenna Gain	:	1.5dBi

Date of Receipt of Sample	:	Oct. 24, 2011
Date of Test	:	Nov. 17 ~ 28, 2011

1.2. Description of Test Facility

Name of Firm	:	**AUDIX Technology Corporation** **EMC Department** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
Test Location & Facility (AC)	:	**Semi-Anechoic Chamber** No. 53-11, Dingfu, Linkou Dist., New Taipei City 244, Taiwan, R.O.C. May 14, 2009 Renewal on Federal Communication Commission Registration Number: 90993
NVLAP Lab. Code	:	200077-0
TAF Accreditation No	:	1724

1.3. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB
	Above 1GHz	± 5.02dB

Remark： Uncertainty = $ku_c(y)$

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

2. CONDUCTED EMISSION MEASUREMET

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

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	E4446A	US44300366	Aug. 04, 11’	Aug. 03, 12’
2.	Test Receiver	R & S	ESCS30	100339	Jun. 23, 11’	Jun. 22, 12’
3.	Amplifier	HP	8447D	2944A06305	Feb. 10, 11’	Feb. 09, 12’
4.	Log Periodic Antenna	Schwarzbeck	UHALP 9108-A	0810	Mar. 08, 11’	Mar. 07, 12’
5.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 08, 11’	Mar. 07, 12’

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

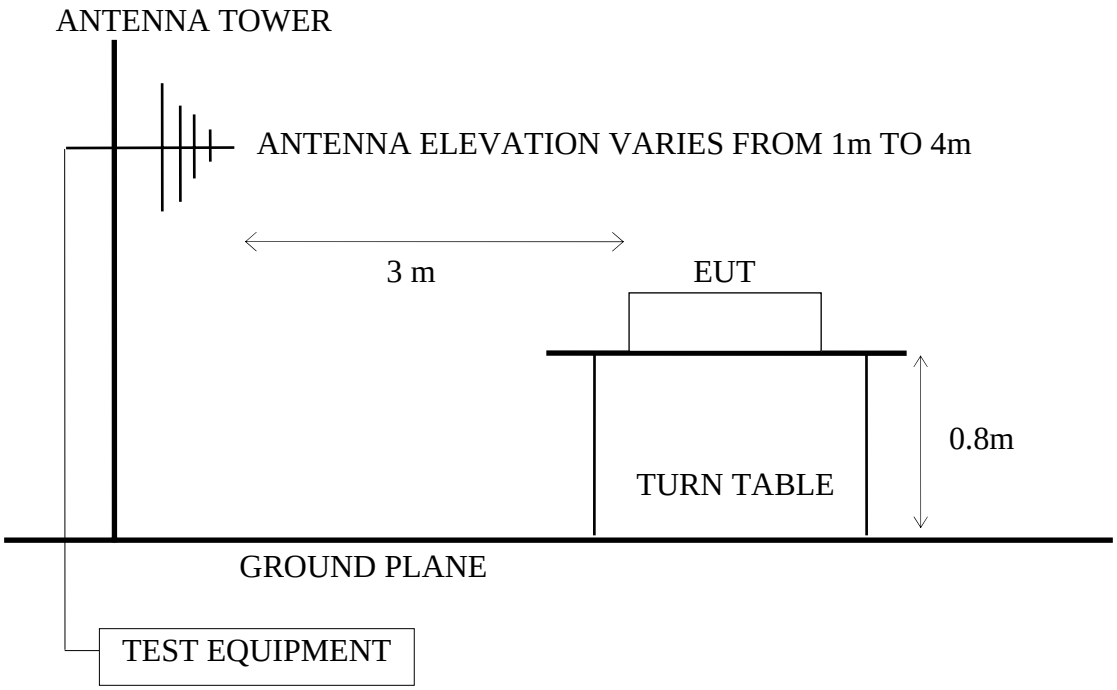
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E4446A	US44300366	Aug. 04, 11’	Aug. 03, 12’
2.	Test Receiver	R & S	ESCS30	100339	Jun. 23, 11’	Jun. 22, 12’
3.	Amplifier	HP	8449B	3008A00529	Dec. 10, 10’	Dec. 09, 11’
4.	Horn Antenna	EMCO	3115	9112-3775	May 09, 11’	May 08, 12’
5.	Horn Antenna	EMCO	3116	2653	Oct. 07, 11’	Oct. 06, 12’
6.	2.4GHz Notch Filter	EWT	EWT-14-0070-R1	G2	Dec. 05, 10’	Dec. 04, 11’
7.	3.5GHz High Pass Filter	HP	84300-80038	005	Jan. 05, 11’	Jan. 04, 12’

3.2. Test Setup

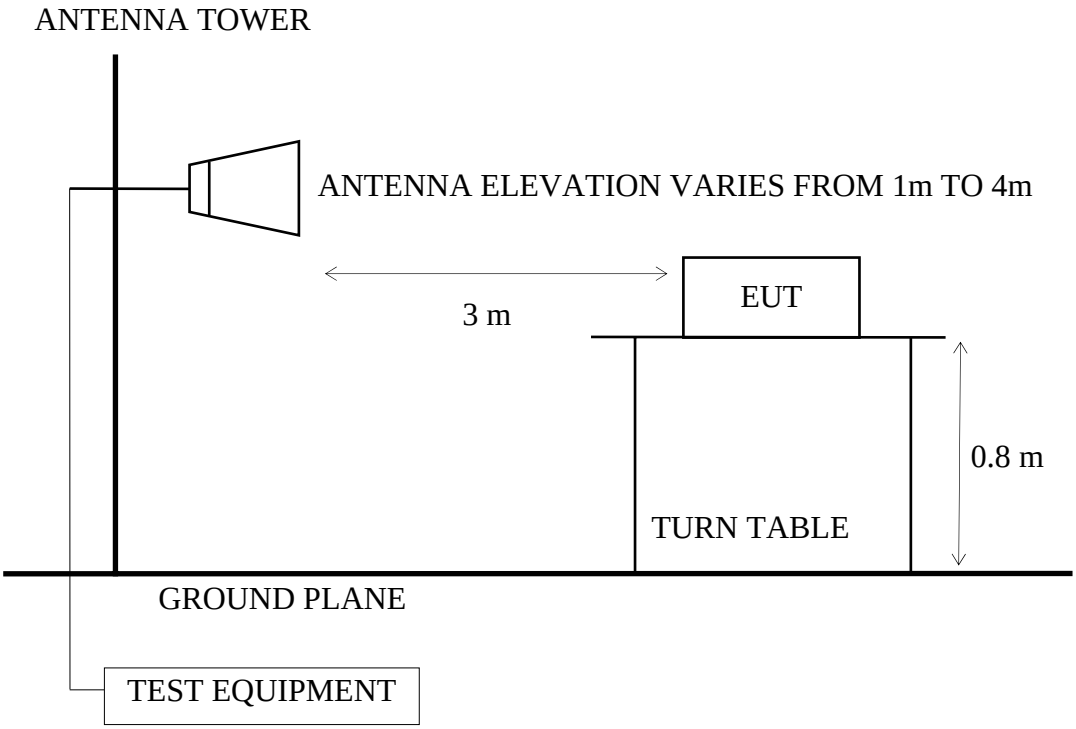
3.2.1. Block Diagram of connection between EUT and simulators

RADIO CONTROL (EUT)

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



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



3.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/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 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark：(1) Emission level (dBμV/m) = 20 log Emission level (μV/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. Set up the EUT (Radio Control) as shown on 3.2.

3.4.2. To turn on the power of all equipment.

3.4.3. The EUT was set to continuously transmit signals at 2405.376MHz、2442.240MHz and 2477.056MHz 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 to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna could be 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 10^{th} harmonics from fundamental frequency) was checked.

Above 1GHz was measured with peak and average detector. For frequency from 7.5GHz to 25GHz, we checked it in 1 meter distance and with a shorter cable 2 meter instead of original's. There is no signal exist.

3.6. Radiated Emission Measurement Results

PASSED.

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

EUT：Radio Control M/N：T18MZ

Test Date：Nov. 23, 2011 Temperature：25℃ Humidity：62%

For Frequency Range 30MHz~1000MHz:

The EUT emitted the fundamental frequency with data code at the stand, side and lying conditions.

The EUT select **worst position "stand"** and with following test modes was performed during this section testing and all the test results are listed in section 3.6.1.

Mode	Channel	Frequency	Test Mode	Position	Reference Test Data	
					Horizontal	Vertical
1.	01	2405.376MHz	Transmit	Stand	# 2	# 1
2.	19	2442.240MHz		Stand	# 2	# 1
3.	36	2477.056MHz		Stand	# 2	# 1

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

For Frequency above 1GHz:

The EUT select **worst position "stand"** and with following test modes was performed during this section testing and all the test results are listed in section 3.6.2.

Mode	Channel	Frequency	Test Mode	Position
1.	01	2405.376MHz	Transmit	Stand
2.	19	2442.240MHz		Stand
3.	36	2477.056MHz		Stand

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

For Restricted Bands:

The EUT select **worst position "stand"** and 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	Reference Test Data	
				Horizontal	Vertical
1.	01	2405.376MHz	Transmit	# 1	# 3
2.	36	2477.056MHz	Transmit	# 7	# 5

3.6.1. Frequency Range 30-1000MHz

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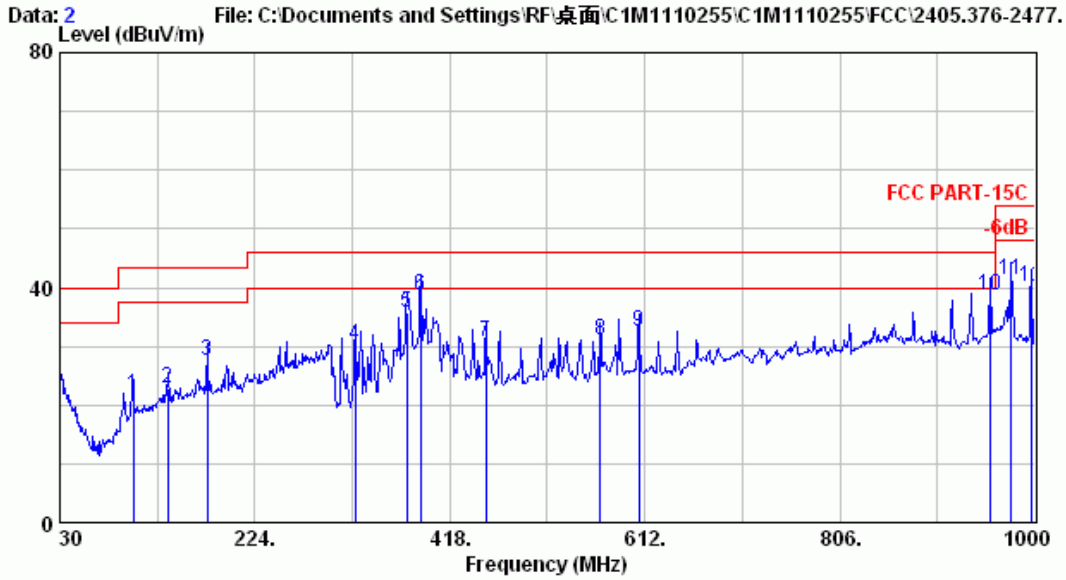

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2405.376

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	102.750	17.40	2.10	2.25	21.75	43.50	21.75	QP
2	137.670	20.01	2.43	0.47	22.91	43.50	20.59	QP
3	176.470	21.21	2.90	3.35	27.46	43.50	16.04	QP
4	323.910	15.10	4.14	10.95	30.19	46.00	15.81	QP
5	375.320	17.15	4.60	13.91	35.65	46.00	10.35	QP
6	388.900	17.47	4.80	16.44	38.71	46.00	7.29	QP
7	453.890	17.70	5.50	7.71	30.91	46.00	15.10	QP
8	567.380	20.97	6.50	3.51	30.99	46.00	15.01	QP
9	606.180	21.45	6.20	4.77	32.42	46.00	13.58	QP
10	956.350	26.33	7.60	4.64	38.57	46.00	7.43	QP
11	976.720	26.16	7.70	7.36	41.22	54.00	12.78	QP
12	996.120	24.67	7.71	7.64	40.02	54.00	13.98	QP

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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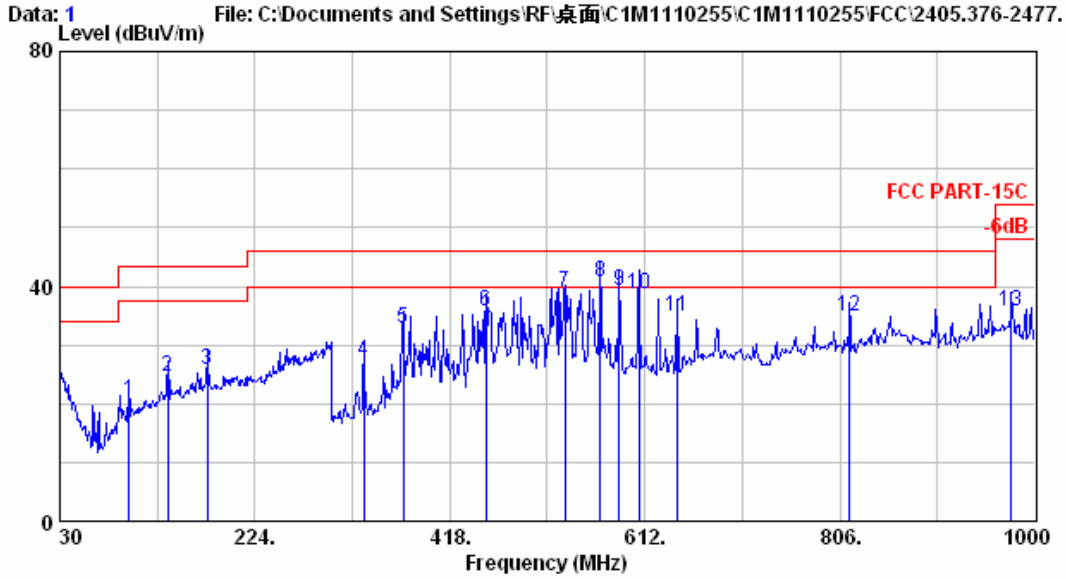

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2405.376

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	98.870	16.96	2.10	1.31	20.37	43.50	23.13	QP
2	137.670	20.01	2.43	2.25	24.69	43.50	18.81	QP
3	176.470	21.21	2.90	1.62	25.72	43.50	17.78	QP
4	332.640	15.21	4.20	7.96	27.37	46.00	18.63	QP
5	371.440	17.08	4.60	11.24	32.91	46.00	13.09	QP
6	453.890	17.70	5.50	12.55	35.75	46.00	10.25	QP
7	532.460	19.64	7.00	12.27	38.90	46.00	7.10	QP
8	567.380	20.97	6.50	13.24	40.71	46.00	5.29	QP
9	586.780	21.01	6.30	12.00	39.31	46.00	6.70	QP
10	606.180	21.45	6.20	11.13	38.78	46.00	7.22	QP
11	644.980	21.15	6.30	7.46	34.90	46.00	11.10	QP
12	815.700	23.89	7.00	3.94	34.83	46.00	11.17	QP
13	976.720	26.16	7.70	1.97	35.83	54.00	18.17	QP

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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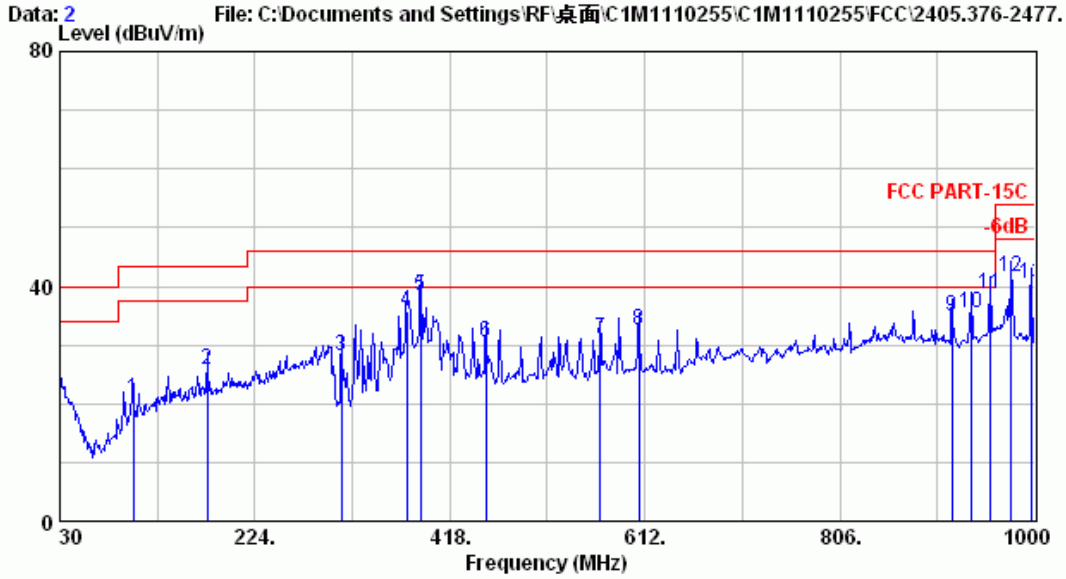

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2442.24

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	102.750	17.40	2.10	1.29	20.79	43.50	22.71	QP
2	176.470	21.21	2.90	1.80	25.91	43.50	17.59	QP
3	310.330	14.93	4.00	9.18	28.11	46.00	17.89	QP
4	375.320	17.15	4.60	13.99	35.74	46.00	10.26	QP
5	388.900	17.47	4.80	16.04	38.31	46.00	7.69	QP
6	453.890	17.70	5.50	7.28	30.48	46.00	15.52	QP
7	567.380	20.97	6.50	3.71	31.18	46.00	14.82	QP
8	606.180	21.45	6.20	4.95	32.60	46.00	13.40	QP
9	917.550	24.84	7.40	2.67	34.91	46.00	11.09	QP
10	935.980	25.39	7.50	2.52	35.41	46.00	10.59	QP
11	956.350	26.33	7.60	4.82	38.75	46.00	7.25	QP
12	976.720	26.16	7.70	7.63	41.49	54.00	12.51	QP
13	996.120	24.67	7.71	7.93	40.31	54.00	13.69	QP

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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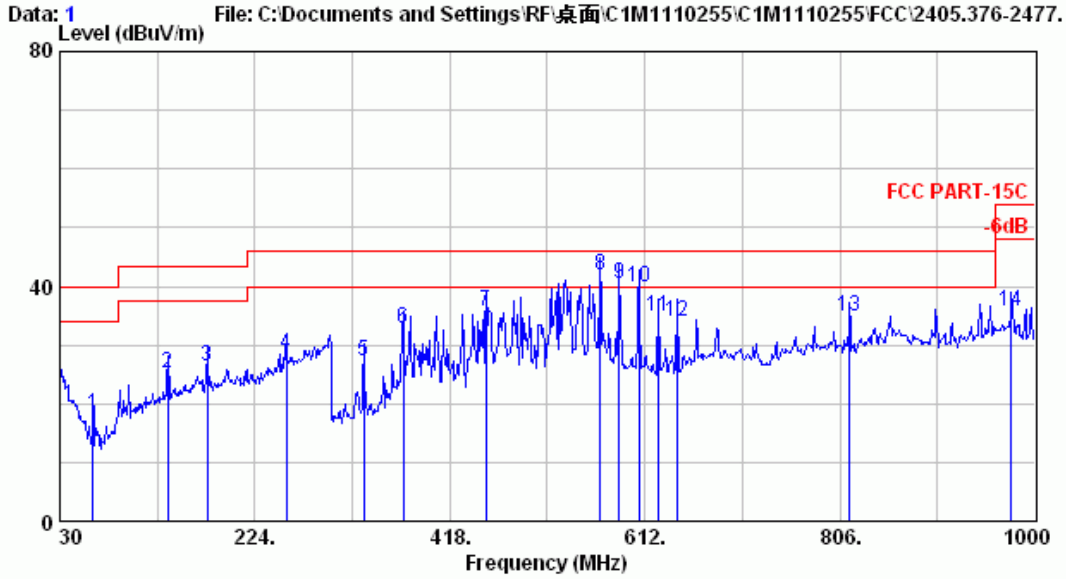

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2442.24

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	62.980	12.04	1.63	4.62	18.29	40.00	21.71	QP
2	137.670	20.01	2.43	2.74	25.18	43.50	18.32	QP
3	176.470	21.21	2.90	2.38	26.49	43.50	17.01	QP
4	255.040	24.19	3.56	0.69	28.44	46.00	17.56	QP
5	332.640	15.21	4.20	7.88	27.29	46.00	18.71	QP
6	371.440	17.08	4.60	11.03	32.70	46.00	13.30	QP
7	453.890	17.70	5.50	12.41	35.60	46.00	10.40	QP
8	567.380	20.97	6.50	14.29	41.76	46.00	4.24	QP
9	586.780	21.01	6.30	13.14	40.45	46.00	5.55	QP
10	606.180	21.45	6.20	12.16	39.81	46.00	6.19	QP
11	624.610	21.31	6.20	7.32	34.83	46.00	11.17	QP
12	644.980	21.15	6.30	6.58	34.03	46.00	11.97	QP
13	815.700	23.89	7.00	3.91	34.80	46.00	11.20	QP
14	976.720	26.16	7.70	1.74	35.60	54.00	18.40	QP

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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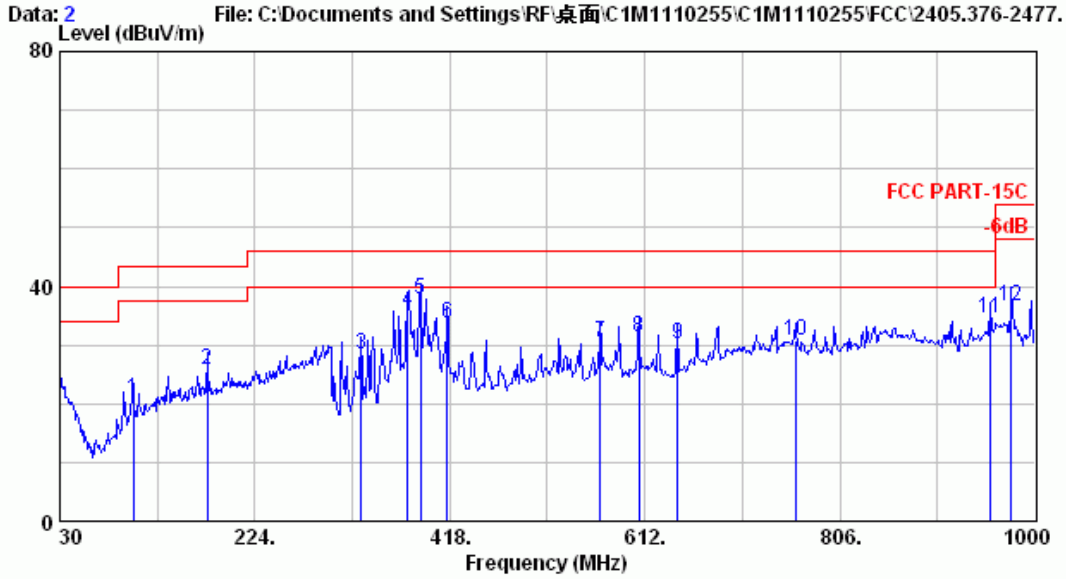

Site no. : A/C Chamber Data no. : 2
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2477.056

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	102.750	17.40	2.10	1.28	20.78	43.50	22.72	QP
2	176.470	21.21	2.90	1.78	25.89	43.50	17.61	QP
3	329.730	15.36	4.14	9.06	28.56	46.00	17.44	QP
4	376.290	17.15	4.60	13.90	35.65	46.00	10.35	QP
5	388.900	17.47	4.80	15.44	37.71	46.00	8.29	QP
6	415.090	16.99	5.10	11.62	33.70	46.00	12.30	QP
7	567.380	20.97	6.50	2.92	30.39	46.00	15.61	QP
8	606.180	21.45	6.20	3.58	31.24	46.00	14.77	QP
9	644.980	21.15	6.30	2.69	30.13	46.00	15.87	QP
10	761.380	23.68	6.70	0.40	30.78	46.00	15.22	QP
11	956.350	26.33	7.60	0.74	34.67	46.00	11.33	QP
12	976.720	26.16	7.70	2.74	36.60	54.00	17.40	QP

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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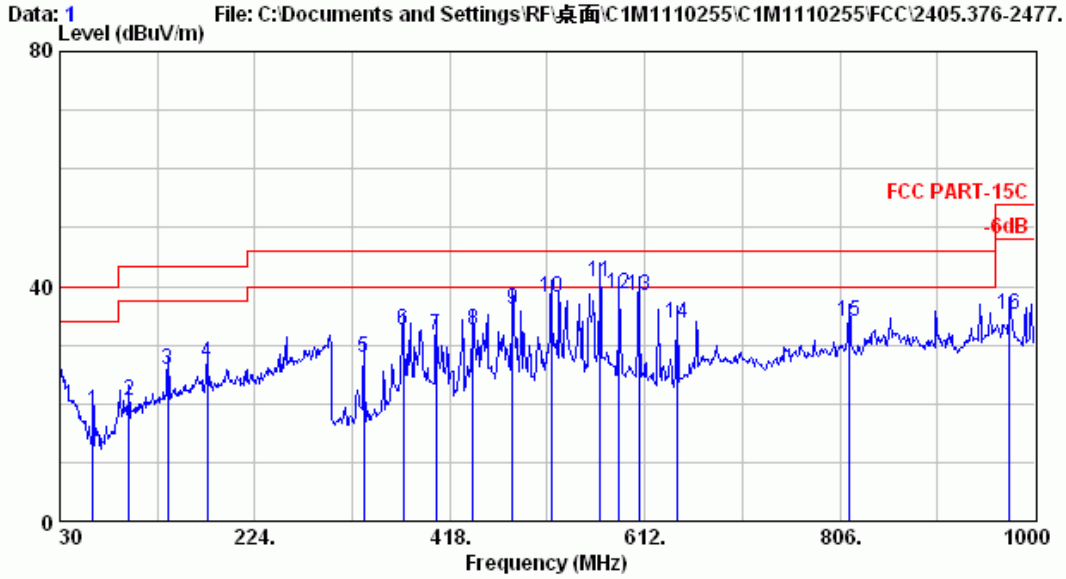

Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m VBA6106A/UHALP9108A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2477.056

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	62.980	12.04	1.63	5.03	18.70	40.00	21.30	QP
2	98.870	16.96	2.10	1.39	20.45	43.50	23.06	QP
3	137.670	20.01	2.43	3.43	25.88	43.50	17.62	QP
4	176.470	21.21	2.90	2.76	26.86	43.50	16.64	QP
5	332.640	15.21	4.20	8.32	27.72	46.00	18.28	QP
6	371.440	17.08	4.60	10.75	32.43	46.00	13.57	QP
7	404.420	17.47	4.90	9.16	31.53	46.00	14.47	QP
8	441.280	17.63	5.30	9.70	32.63	46.00	13.37	QP
9	480.080	18.68	6.05	11.42	36.15	46.00	9.85	QP
10	518.880	20.01	6.90	11.26	38.17	46.00	7.83	QP
11	567.380	20.97	6.50	13.34	40.82	46.00	5.18	QP
12	586.780	21.01	6.30	11.29	38.59	46.00	7.41	QP
13	606.180	21.45	6.20	10.86	38.51	46.00	7.49	QP
14	644.980	21.15	6.30	6.13	33.57	46.00	12.43	QP
15	815.700	23.89	7.00	3.09	33.98	46.00	12.02	QP
16	974.780	26.52	7.70	0.92	35.14	54.00	18.86	QP

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. Above 1GHz Frequency Range Measurement Results

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2405.376MHz

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
	1015.12	24.35	4.21	18.64	47.20	54.00	-6.80
	1031.92	24.40	4.24	17.16	45.80	54.00	-8.20
	1053.76	24.44	4.29	20.09	48.82	54.00	-5.18
	1173.92	24.49	4.34	17.45	46.28	54.00	-7.72
	1090.72	24.54	4.37	18.10	47.01	54.00	-6.99
	1112.56	24.64	4.42	13.14	42.20	54.00	-11.80
	1132.72	24.69	4.46	13.26	42.41	54.00	-11.59
	3206.68	30.51	7.36	15.63	53.50	54.00	-0.50
	4813.00	32.92	9.14	15.99	58.05	74.00	-15.95
*	7214.00	35.84	11.25	11.74	58.83	63.54	-4.71
*	12030.00	38.69	14.96	12.10	65.75	83.54	-17.79

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Horizontal (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4813.00	58.05	-12.47	45.58	54.00	8.42
* 12030.00	65.75	-12.47	53.28	63.54	10.26

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.
4. *: Measured at 1m and limit is transformed to 63.54dBμV/m by adding a factor 9.5 which is calculated from 20log(3/1).

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2405.376MHz

	Emission Frequency	Antenna Factor	Cable Loss	Reading Vertical	Emission Level Vertical	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
	1015.12	24.35	4.21	11.37	39.93	54.00	-14.07
	1053.76	24.44	4.29	13.68	42.41	54.00	-11.59
	1073.92	24.49	4.34	13.69	42.52	54.00	-11.48
	1090.72	24.54	4.37	13.37	42.28	54.00	-11.72
	1171.36	24.78	4.53	11.95	41.26	54.00	-12.74
	1208.32	24.88	4.60	13.13	42.61	54.00	-11.39
	1250.32	25.02	4.68	11.14	40.84	54.00	-13.16
	3210.64	30.51	7.36	24.31	62.18	74.00	-11.82
	4813.00	32.92	9.14	15.04	57.10	74.00	-16.90
*	7218.00	35.84	11.25	17.83	64.92	83.54	-18.62
*	12035.00	38.69	14.96	14.41	68.06	83.54	-15.48

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

	Emission Frequency	Peak Value	Duty Cycle Factor	Average Value Vertical	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
	3210.64	62.18	-12.47	49.71	54.00	4.29
	4813.00	57.10	-12.47	44.63	54.00	9.37
*	7218.00	64.92	-12.47	52.45	63.54	11.09
*	12035.00	68.06	-12.47	55.59	63.54	7.95

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.
4. *: Measured at 1m and limit is transformed to 63.54dBμV/m by adding a factor 9.5 which is calculated from 20log(3/1).

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2442.240MHz

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
	1015.12	24.35	4.21	17.90	46.46	54.00	-7.54
	1033.60	24.40	4.25	16.44	45.09	54.00	-8.91
	1053.76	24.44	4.29	19.59	48.32	54.00	-5.68
	1073.92	24.49	4.34	16.19	45.02	54.00	-8.98
	1090.72	24.54	4.37	18.17	47.08	54.00	-6.92
	1132.72	24.69	4.46	12.86	42.01	54.00	-11.99
	3256.84	30.62	7.40	11.61	49.63	54.00	-4.37
	4888.00	33.09	9.16	15.23	57.48	74.00	-16.52
*	7324.00	36.09	11.44	11.70	59.23	63.54	-4.31

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

	Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Horizontal (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*	4888.00	57.48	-12.47	45.01	63.54	18.53

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.
4. *: Measured at 1m and limit is transformed to 63.54dBμV/m by adding a factor 9.5 which is calculated from 20log(3/1).

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2442.240MHz

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
	1015.12	24.35	4.21	11.47	40.03	54.00	-13.97
	1053.76	24.44	4.29	13.28	42.01	54.00	-11.99
	1073.92	24.49	4.34	12.45	41.28	54.00	-12.72
	1090.72	24.54	4.37	12.40	41.31	54.00	-12.69
	1171.36	24.78	4.53	12.17	41.48	54.00	-12.52
	1250.32	25.02	4.68	12.49	42.19	54.00	-11.81
	1325.00	25.22	4.91	11.08	41.21	54.00	-12.79
	3256.84	30.62	7.40	21.09	59.11	74.00	-14.89
	4888.00	33.09	9.16	14.93	57.18	74.00	-16.82
*	7324.00	36.09	11.44	11.09	58.62	63.54	-4.92

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Vertical (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3256.84	59.11	-12.47	46.64	54.00	7.36
4888.00	57.18	-12.47	44.71	54.00	9.29

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2477.056MHz

	Emission Frequency	Antenna Factor	Cable Loss	Reading Horizontal	Emission Level Horizontal	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
	1015.12	24.35	4.21	18.20	46.76	54.00	-7.24
	1031.92	24.40	4.24	17.06	45.70	54.00	-8.30
	1053.76	24.44	4.29	20.16	48.89	54.00	-5.11
	1073.92	24.49	4.34	16.33	45.16	54.00	-8.84
	1090.72	24.54	4.37	18.15	47.06	54.00	-6.94
	1132.72	24.69	4.46	12.63	41.78	54.00	-12.22
	3303.04	30.69	7.47	11.70	49.86	54.00	-4.14
	4955.50	33.23	9.1	15.94	58.27	74.00	-15.73
*	7434.00	36.33	11.61	14.07	62.01	63.54	-1.53
*	12385.00	38.54	15.01	14.08	67.63	83.54	-15.91

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

	Emission Frequency	Peak Value	Duty Cycle Factor	Average Value Horizontal	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
	4955.50	58.27	-12.47	45.80	54.00	8.20
*	12385.00	67.63	-12.47	55.16	63.54	8.38

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.
4. *: Measured at 1m and limit is transformed to 63.54dBμV/m by adding a factor 9.5 which is calculated from 20log(3/1).

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmitting Mode, Frequency: 2477.056MHz

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
	1015.12	24.35	4.21	10.94	39.50	54.00	-14.50
	1053.76	24.44	4.29	12.33	41.06	54.00	-12.94
	1090.72	24.54	4.37	12.74	41.65	54.00	-12.35
	1171.36	24.78	4.53	12.03	41.34	54.00	-12.66
	1208.32	24.88	4.60	11.40	40.88	54.00	-13.12
	1250.32	25.02	4.68	11.44	41.14	54.00	-12.86
	1653.52	26.3	6.52	10.71	43.53	54.00	-10.47
	3303.04	30.69	7.47	20.30	58.46	74.00	-15.54
	4958.50	33.23	9.10	16.33	58.66	74.00	-15.34
*	6604.00	34.43	10.55	11.32	56.30	63.54	-7.24

Remarks: 1. Emission level=Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.
3. All final readings of measurement were with Peak values.
4. If the Average limit is met when using a Peak detector, the Average detector is unnecessary
5. *: Measured at 1m and limit is transformed to 83.54dBμV/m(Peak) & 63.54dBμV/m (Average) by adding a factor 9.5 which is calculated from 20log(3/1).

Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Vertical (dBμV/m)	Limit (dBμV/m)	Margin (dB)
3303.04	58.46	-12.47	45.99	54.00	8.01
4958.50	58.66	-12.47	46.19	54.00	7.81

Remarks: 1. Duty Cycle Factor = 20log(1.83ms*13/100ms) = -12.47
2. Average value=Peak value+ Duty Cycle Factor
3. All final readings of measurement were with Average values.

3.6.3. Restricted Bands Measurement Results

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

Test Mode： Transmit, Channel: 01, Frequency: 2405.376MHz

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Peak*	2329.440	28.03	6.26	13.43	47.72	74.00	26.28

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Low frequency section (spurious in the restricted band 2310-2420MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

	Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Horizontal (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Average*	2329.440	47.72	-12.47	35.25	54.00	18.75

Remarks: 1. Duty Cycle Factor = 20log(1.830ms*13/100ms) = -12.47
2. Average value=Peak value+Duty Cycle Factor
3. Low frequency section (spurious in the restricted band 2310-2420MHz).
4. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

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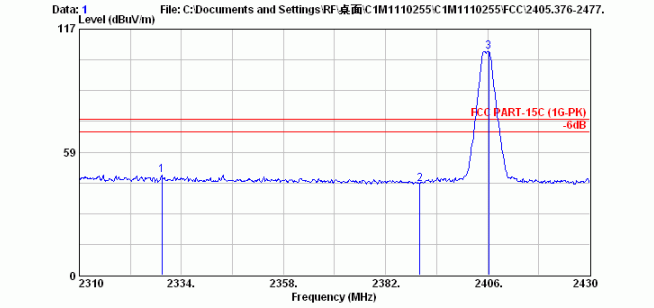


Site no. : A/C Chamber Data no. : 1
Dis. / Ant. : 3m 3115(3775) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2405.376

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2329.440	28.03	6.26	13.43	47.72	74.00	26.28	Peak
2	2390.040	28.10	6.34	9.03	43.47	74.00	30.53	Peak
3	2406.240	28.11	6.36	72.00	106.48	74.00	-32.48	Peak

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

Date of Test： Nov. 23, 2011 Temperature： 25℃

EUT： Radio Control Humidity： 62%

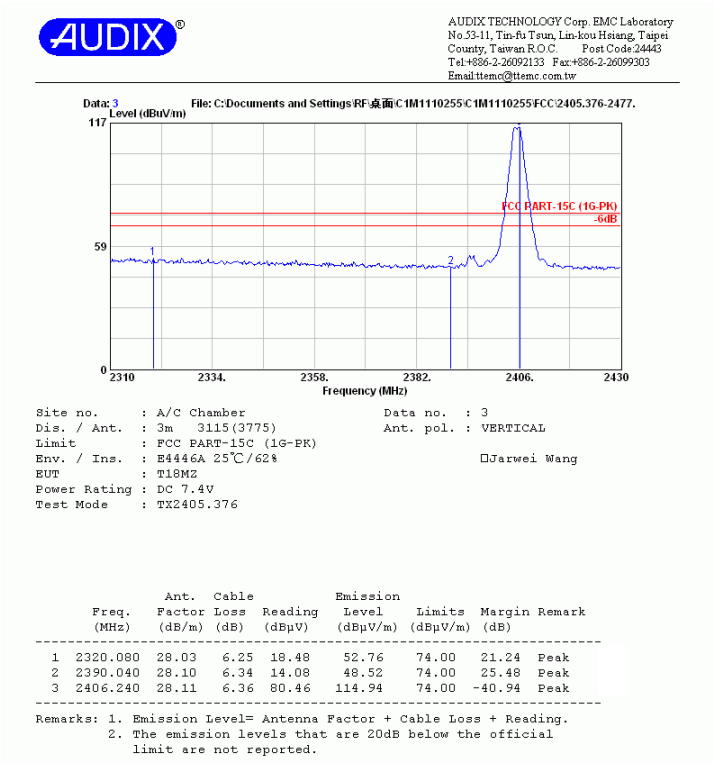
Test Mode： Transmit, Channel: 01, Frequency: 2405.376MHz

	Emission Frequency	Antenna Factor	Cable Loss	Reading Vertical	Emission Level Vertical	Limits	Margin
	(MHz)	(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)
Peak*	2320.080	28.03	6.25	18.48	52.76	74.00	21.24

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Low frequency section (spurious in the restricted band 2310-2420MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

	Emission Frequency	Peak Value	Duty Cycle Factor	Average Value Vertical	Limit	Margin
	(MHz)	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Average*	2320.080	52.76	-12.47	40.29	54.00	13.71

Remarks: 1. Duty Cycle Factor = 20log(1.830ms*13/100ms) = -12.47
2. Average value=Peak value+Duty Cycle Factor
3. Low frequency section (spurious in the restricted band 2310-2420MHz).
4. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2320.080	28.03	6.25	18.48	52.76	74.00	21.24	Peak
2	2390.040	28.10	6.34	14.08	48.52	74.00	25.48	Peak
3	2406.240	28.11	6.36	80.46	114.94	74.00	-40.94	Peak

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

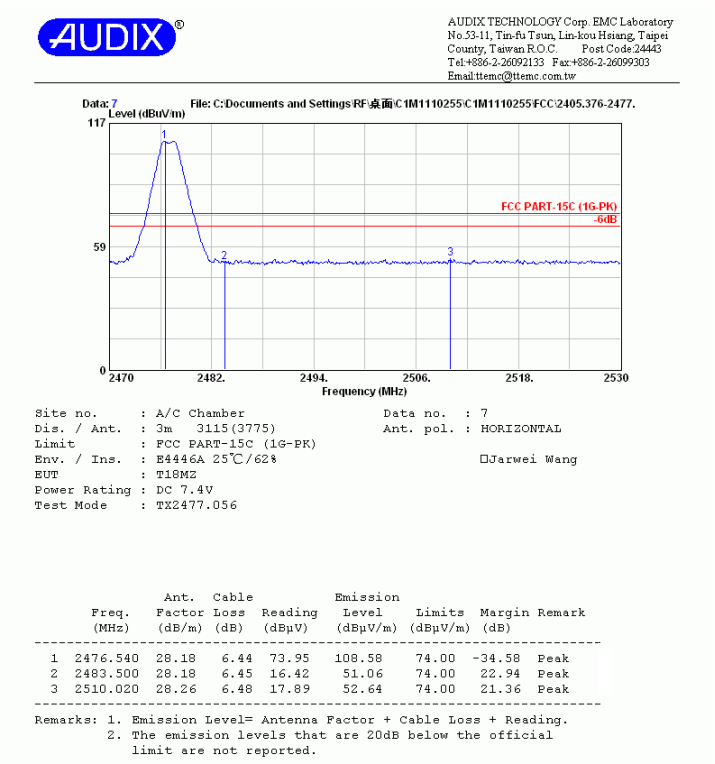
Date of Test：	Nov. 23, 2011	Temperature：	25℃
EUT：	Radio Control	Humidity：	62%
Test Mode：	Transmit, Channel: 68, Frequency: 2477.056MHz		

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Horizontal (dBμV)	Emission Level Horizontal (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Peak*	2483.500	28.18	6.45	16.42	51.05	74.00	22.95

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Low frequency section (spurious in the restricted band 2450-2530MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

	Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Horizontal (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Average*	2483.500	51.05	-12.47	38.58	54.00	15.42

Remarks: 1. Duty Cycle Factor = 20log(1.830ms*13/100ms) = -12.47
2. Average value=Peak value+Duty Cycle Factor
3. Low frequency section (spurious in the restricted band 2450-2530MHz).
4. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



Site no. : A/C Chamber Data no. : 7
Dis. / Ant. : 3m 3115(3775) Ant. pol. : HORIZONTAL
Limit : FCC PART-15C (1G-PK)
Env. / Ins. : E4446A 25℃/62% ☐Jarwei Wang
EUT : T18MZ
Power Rating : DC 7.4V
Test Mode : TX2477.056

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2476.540	28.18	6.44	73.95	108.58	74.00	-34.58	Peak
2	2483.500	28.18	6.45	16.42	51.06	74.00	22.94	Peak
3	2510.020	28.26	6.48	17.89	52.64	74.00	21.36	Peak

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

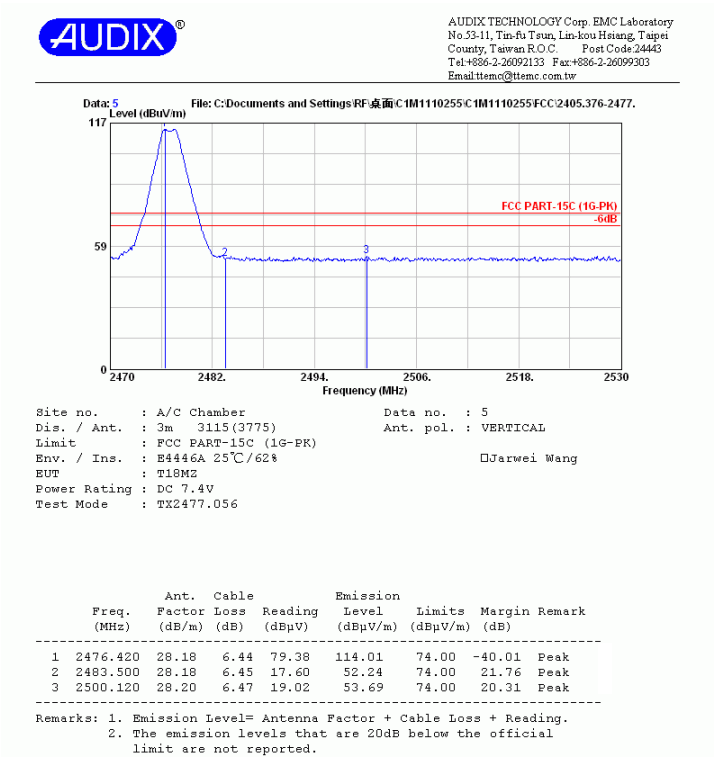
Date of Test：	Nov. 23, 2011	Temperature：	25℃
EUT：	Radio Control	Humidity：	62%
Test Mode：	Transmit, Channel: 68, Frequency: 2477.056MHz		

	Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading Vertical (dBμV)	Emission Level Vertical (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Peak*	2483.500	28.18	6.45	17.60	52.23	74.00	21.77

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. Low frequency section (spurious in the restricted band 2450-2530MHz).
3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.

	Emission Frequency (MHz)	Peak Value (dB/m)	Duty Cycle Factor (dB)	Average Value Vertical (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Average*	2483.500	52.23	-12.47	39.76	54.00	14.24

Remarks: 1. Duty Cycle Factor = 20log(1.830ms*13/100ms) = -12.47
2. Average value=Peak value-Duty Cycle Factor
3. Low frequency section (spurious in the restricted band 2450-2530MHz).
4. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



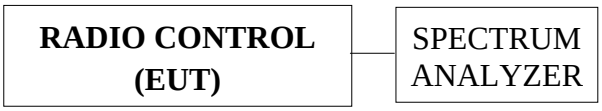
4. DUTY CYCLE FACTOR

4.1. Test Equipment

The following test equipment was used during the duty cycle factor measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 14, 11’	Oct. 13, 12’

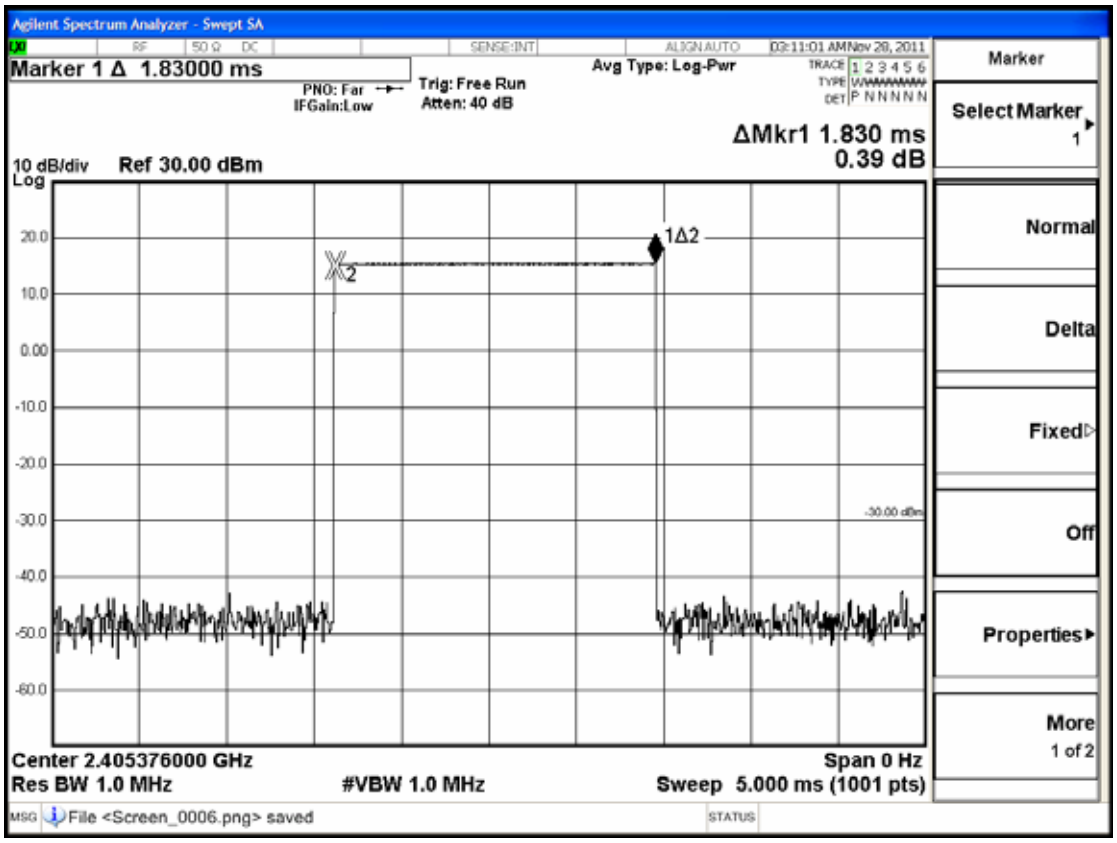
4.2. Block Diagram of Test Setup

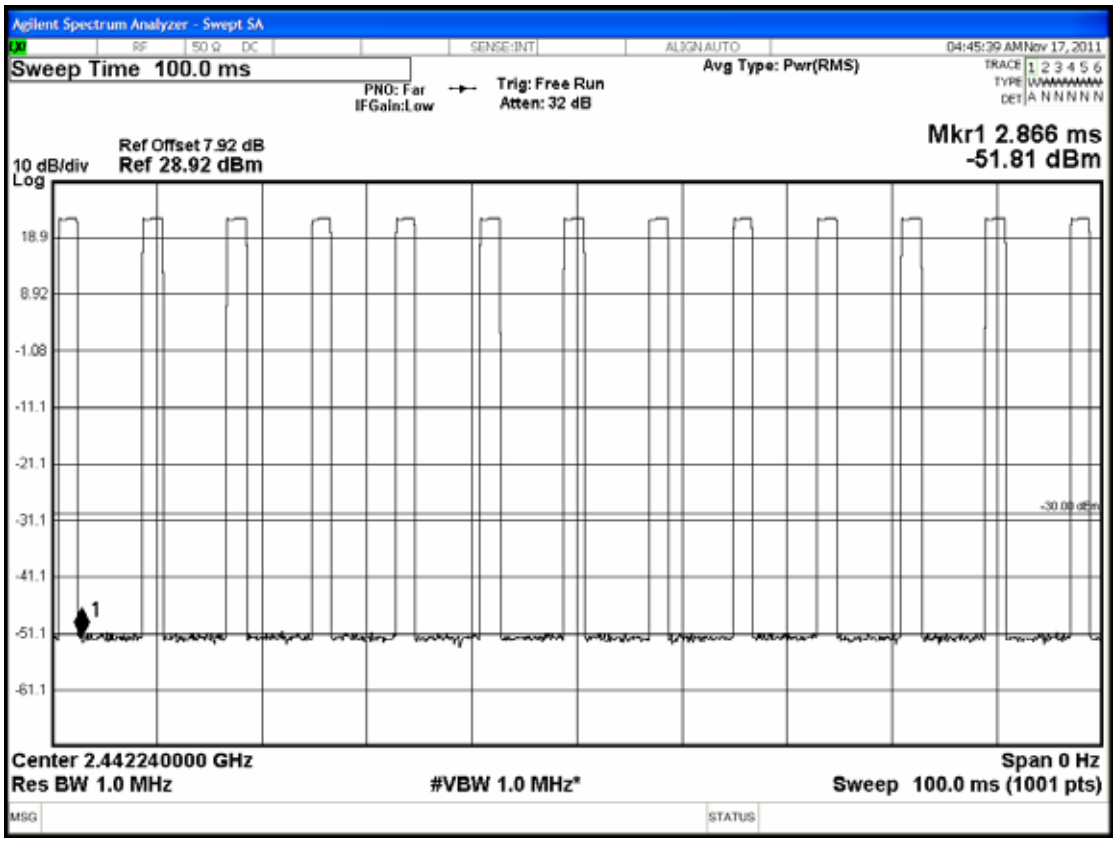


4.3. Test Results

PASSED.

(Test Date: Nov. 28, 2011 Temperature : 25℃ Humidity : 52%)





Duty Cycle Factor=20log(dwell time*13/100ms)
=20log(1.83ms*13/100ms)=-12.47

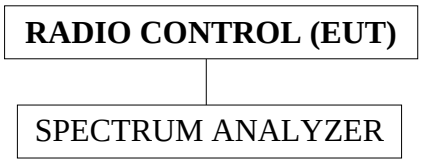
5. 6dB BANDWIDTH MEASUREMENT

5.1. Test Equipment

The following test equipment was used during the 20dB bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 14, 11'	Oct. 13, 12'

5.2. Block Diagram of Test Setup



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

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

5.4. Operating Condition of EUT

5.4.1. Set up the EUT and simulator as shown on 5.2.

5.4.2. To turn on the power of all equipment.

5.4.3. EUT (Radio Control) was on transmitting frequency function during the testing.

5.5. 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.
The measurement guideline was according to KDB 558074.

5.6. Test Results

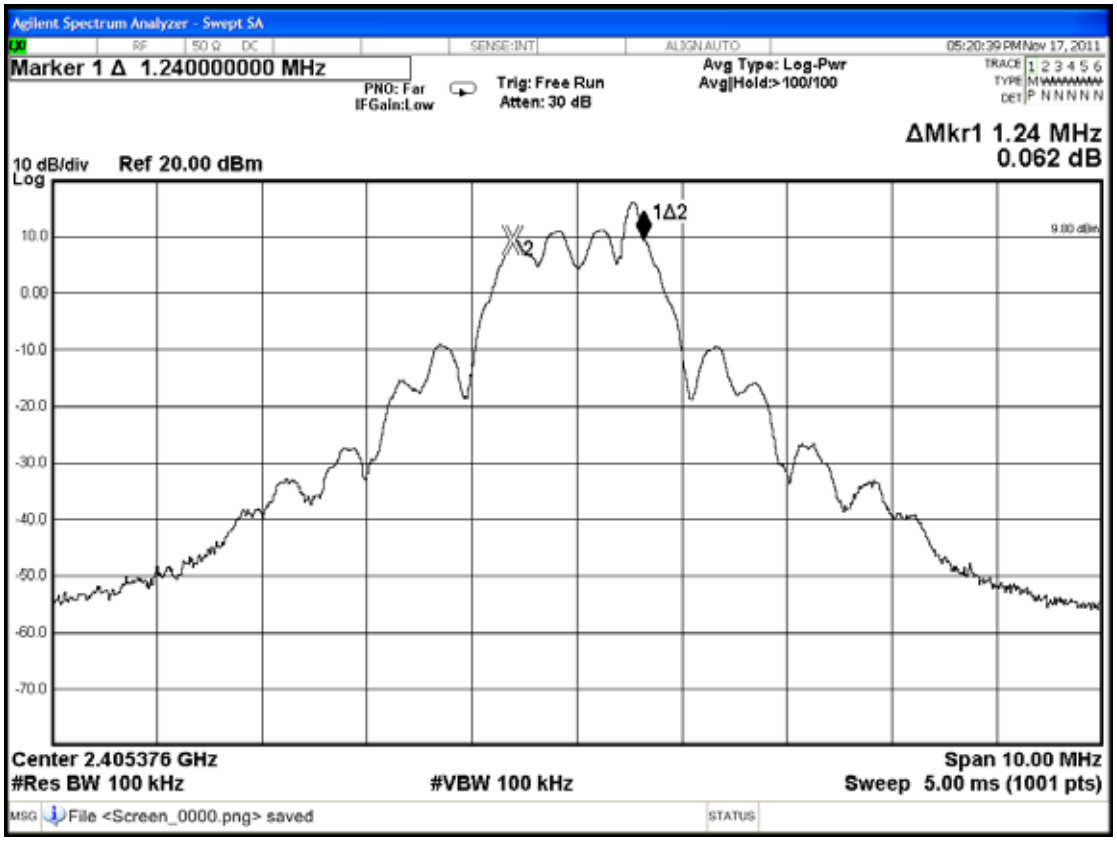
PASSED. All the test results are attached in next pages.

(Test Date: Nov. 17, 2011 Temperature : 25℃ Humidity : 52%)

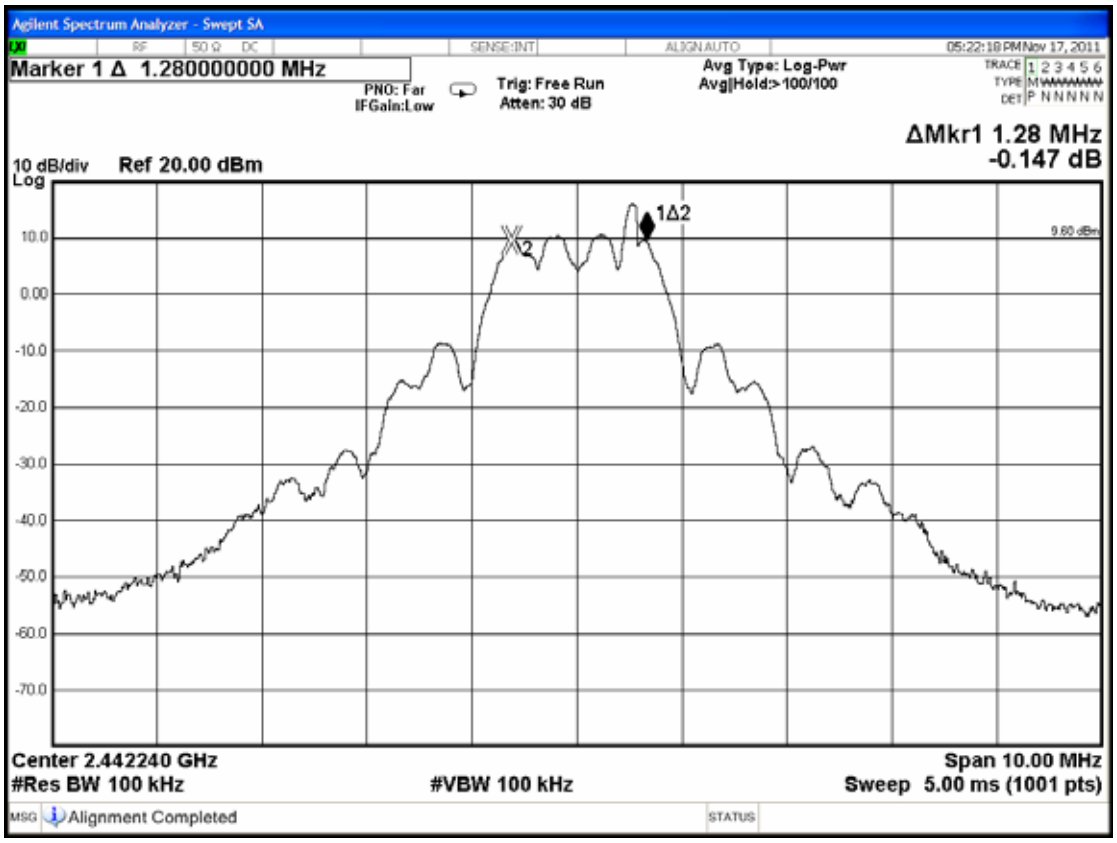
Mode	Channel	Frequency	**6dB Bandwidth**
1.	CH 01	2405.376MHz	**1.24MHz**
2.	CH 19	2442.240MHz	**1.28MHz**
3.	CH 36	2477.056MHz	**1.30MHz**

[Limit: least 500kHz]

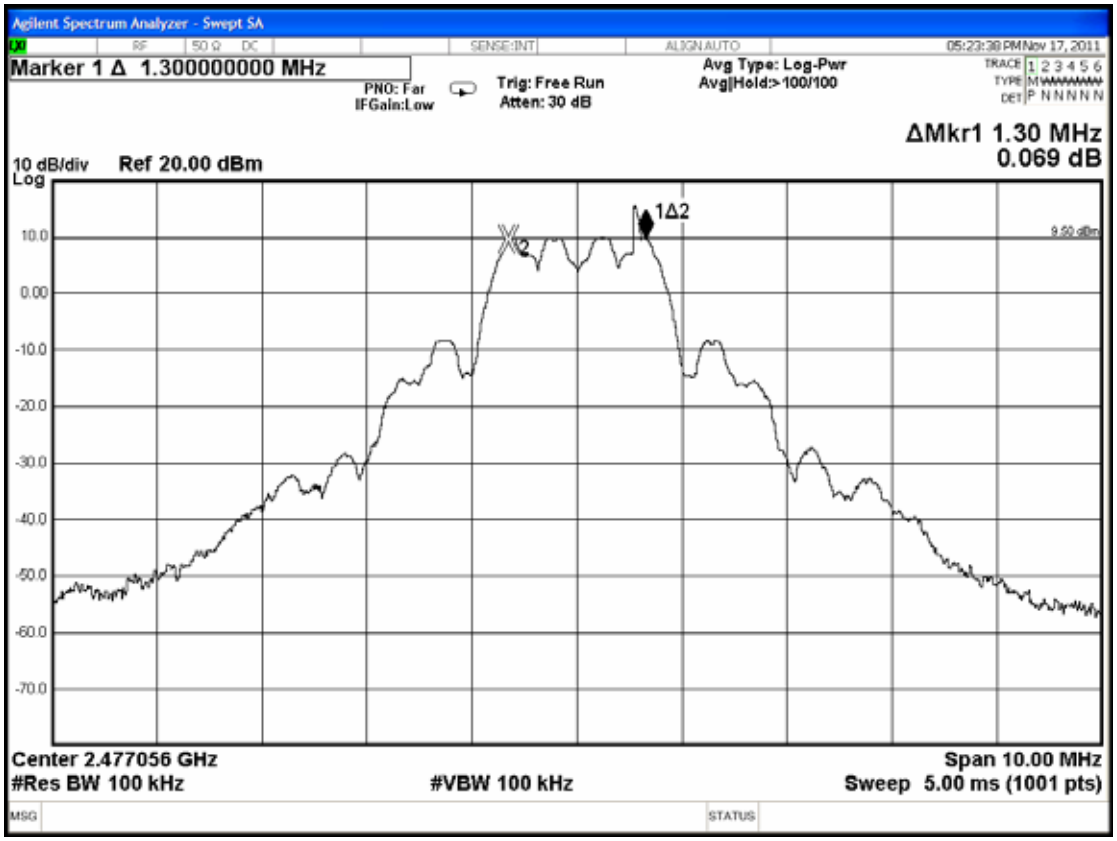
5.6.1. Channel 01, Frequency: 2405.376MHz



5.6.2. Channel 19, Frequency: 2442.240MHz



5.6.3. Channel 36, Frequency: 2477.056MHz



6. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1. 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.	Spectrum Analyzer	Agilent	N9030A-544	US51350140	Oct. 14, 11'	Oct. 13, 12'

6.2. Block Diagram of Test Setup

The same as section.4.2.

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

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

6.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 5.4 except the test set up replaced by section 6.2.

6.5. Test Procedure

Setting the spectrum span to encompass the EBW, RBW=2MHz and VBW=3MHz.
The find the peak value
The measurement guideline was according to KDB 558074.

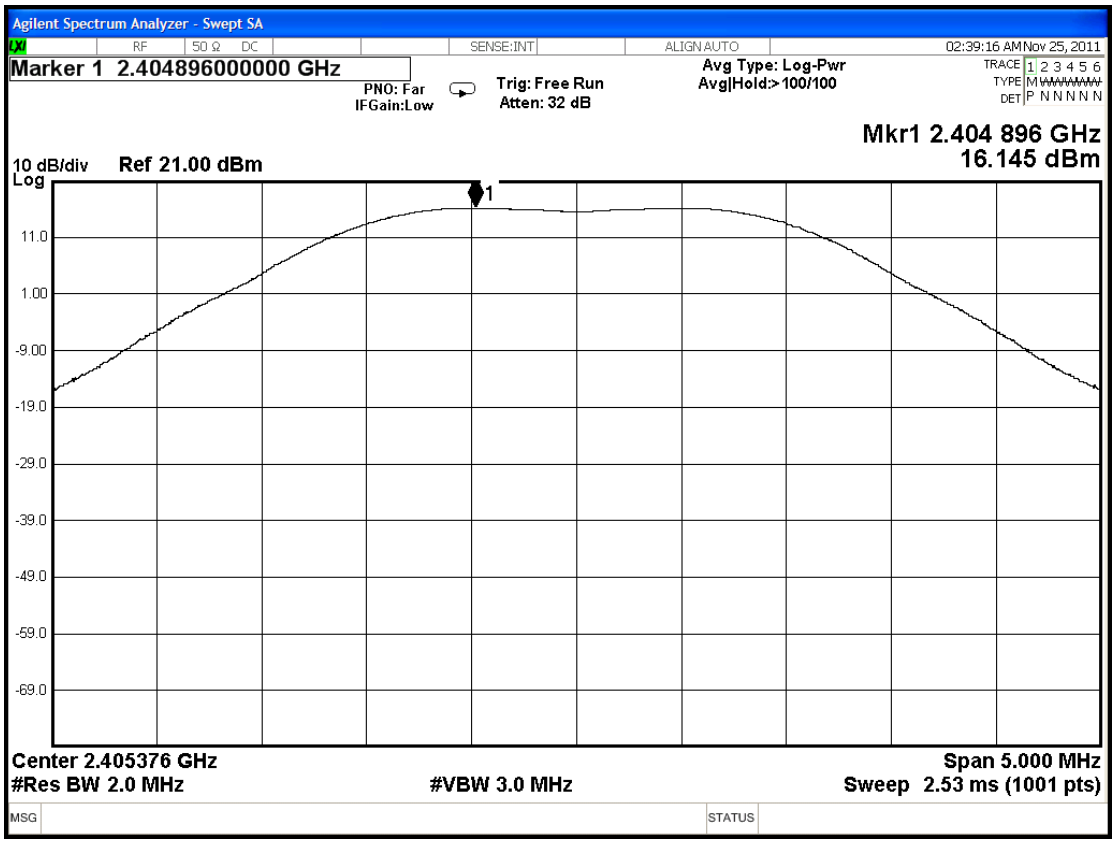
6.6. Test Results

PASSED. All the test results are listed below.

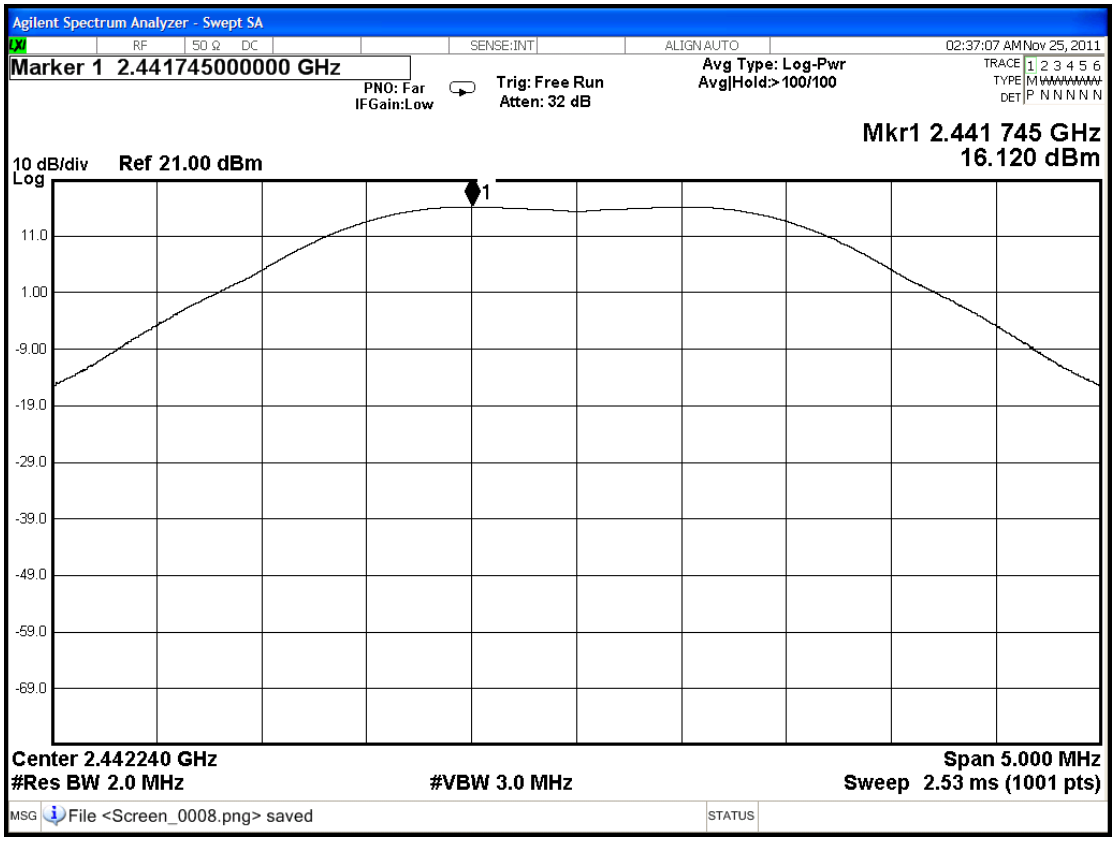
(Test Date: Nov. 25, 2011 Temperature : 25℃ Humidity : 57%)

No.	Channel	Test Frequency	**Peak Output Power**	Limit
1.	CH 01	2405.376MHz	**16145dBm**	30dBm
2.	CH 19	2442.240MHz	**16.120dBm**	30dBm
3.	CH 36	2477.056MHz	**16.038dBm**	30dBm

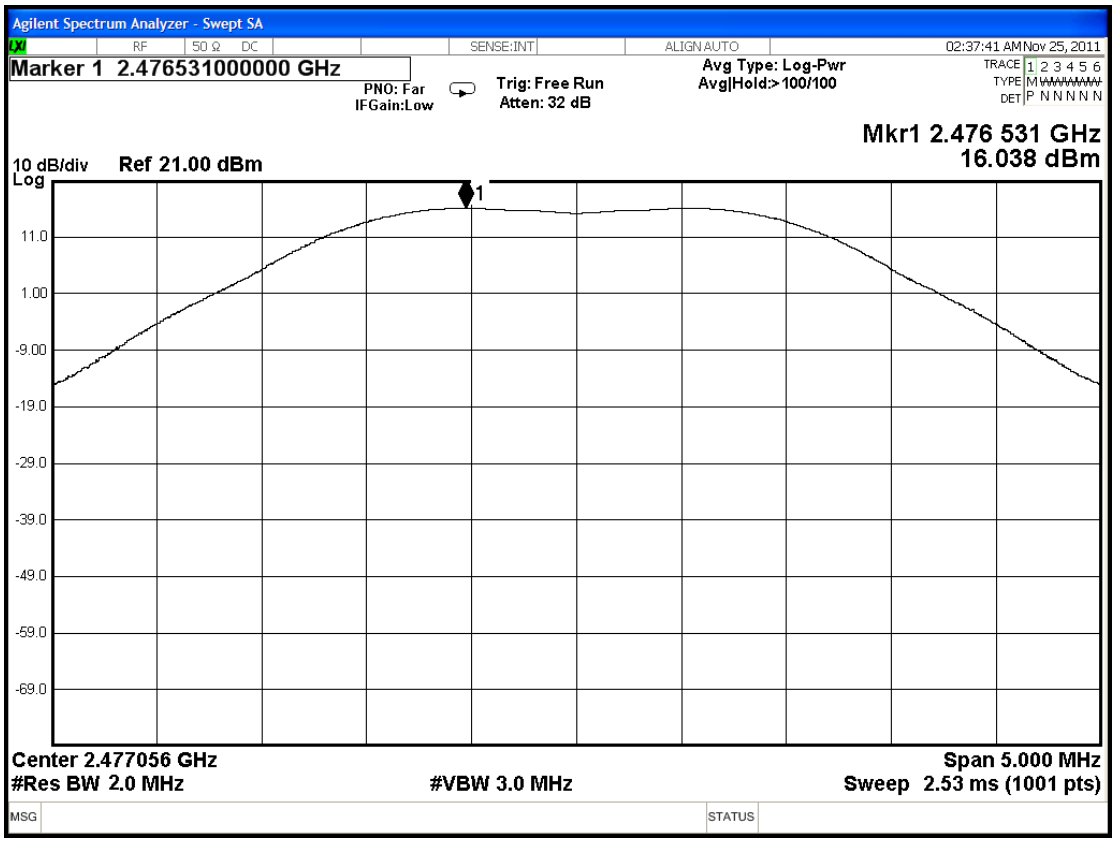
6.6.1. Channel 01, Frequency: 2405.376MHz



6.6.2. Channel 19, Frequency: 2442.240MHz



6.6.3. Channel 36, Frequency: 2477.056MHz



7. EMISSION LIMITATIONS MEASUREMENT

7.1. 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	N9030A-544	US51350140	Oct. 14, 11’	Oct. 13, 12’

7.2. Block Diagram of Test Setup

The same as section.4.2.

7.3. 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)

7.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 5.4 except the test set up replaced by section 7.2.

7.5. Test Procedure

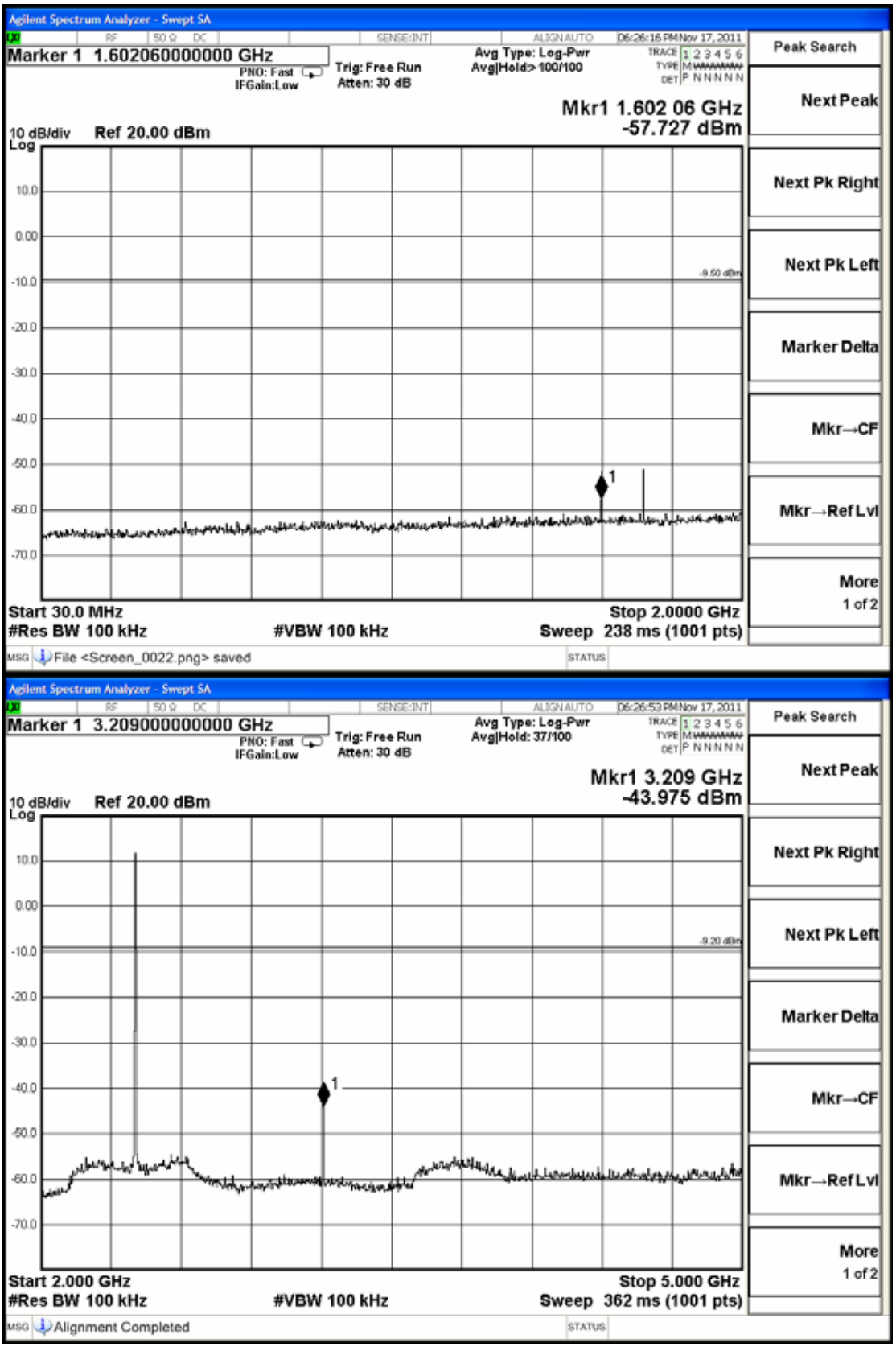
The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW.
The measurement guideline was according to KDB 558074.

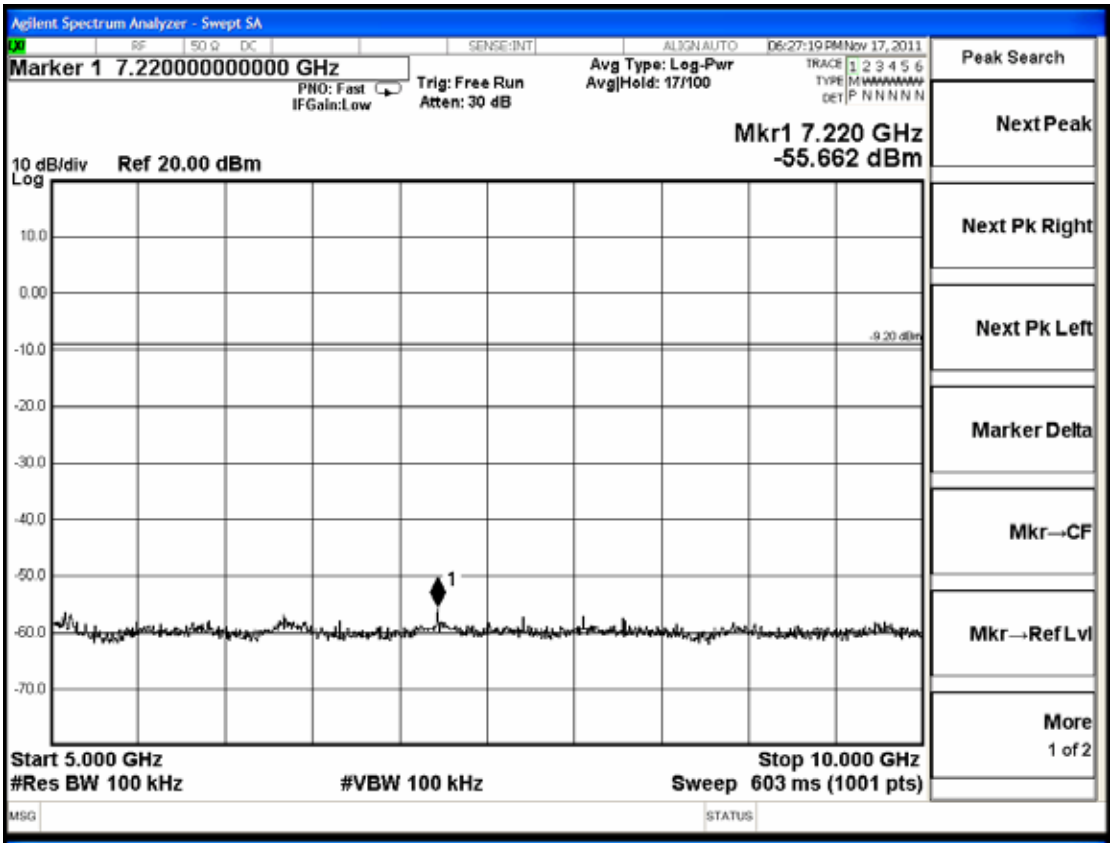
7.6. Test Results

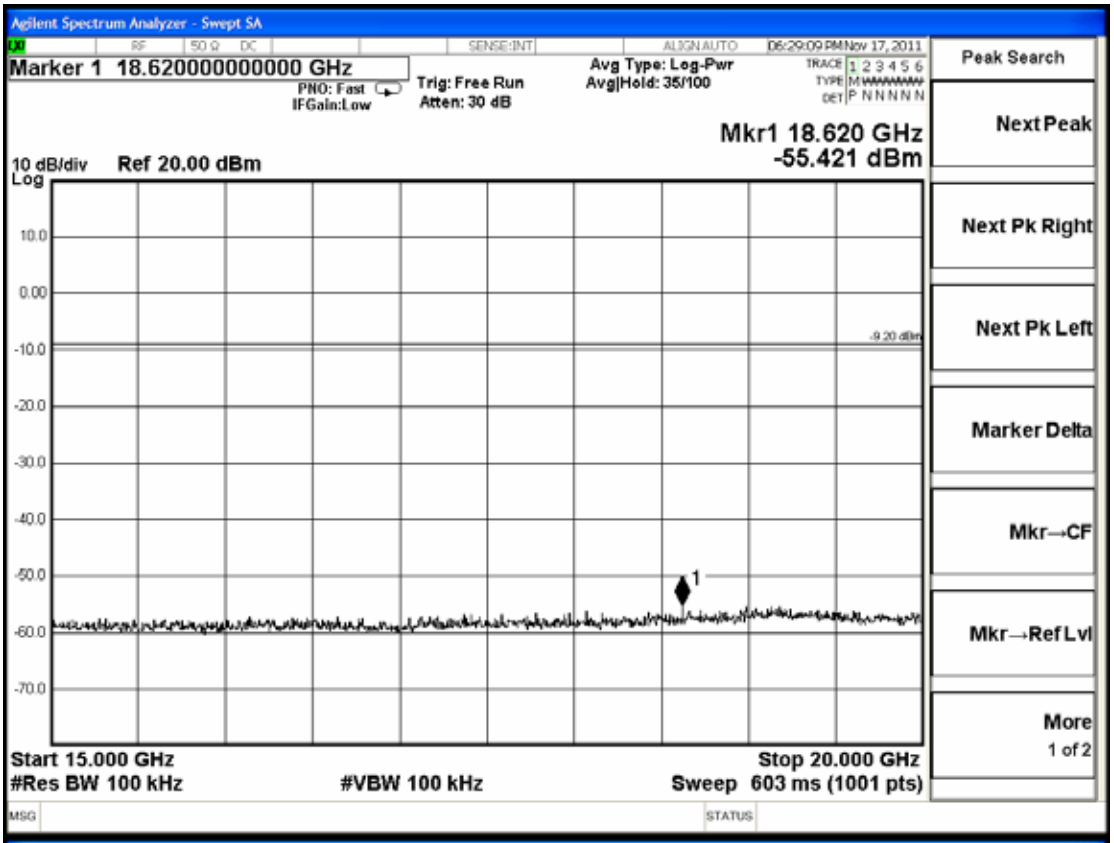
PASSED. The testing data was attached in the next pages.

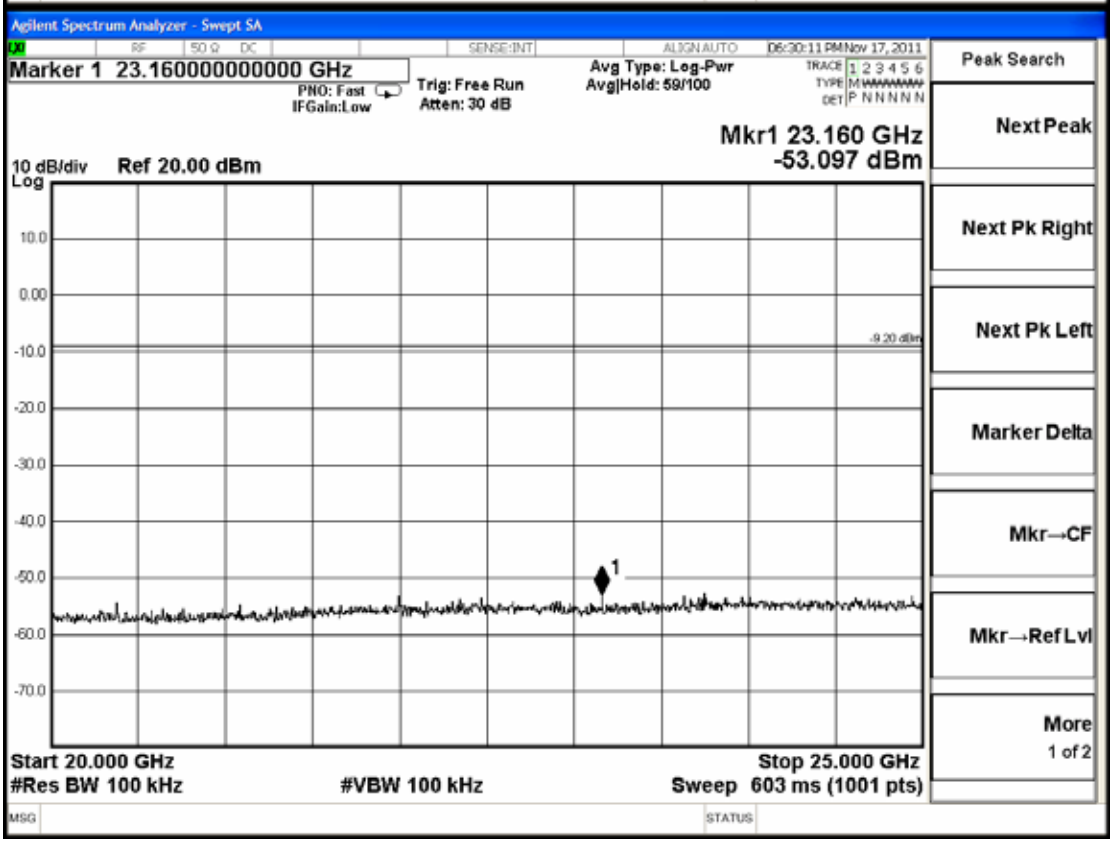
(Test Date: Nov. 17, 2011 Temperature : 25℃ Humidity : 52%)

7.6.1. Channel 01, Frequency: 2405.376MHz

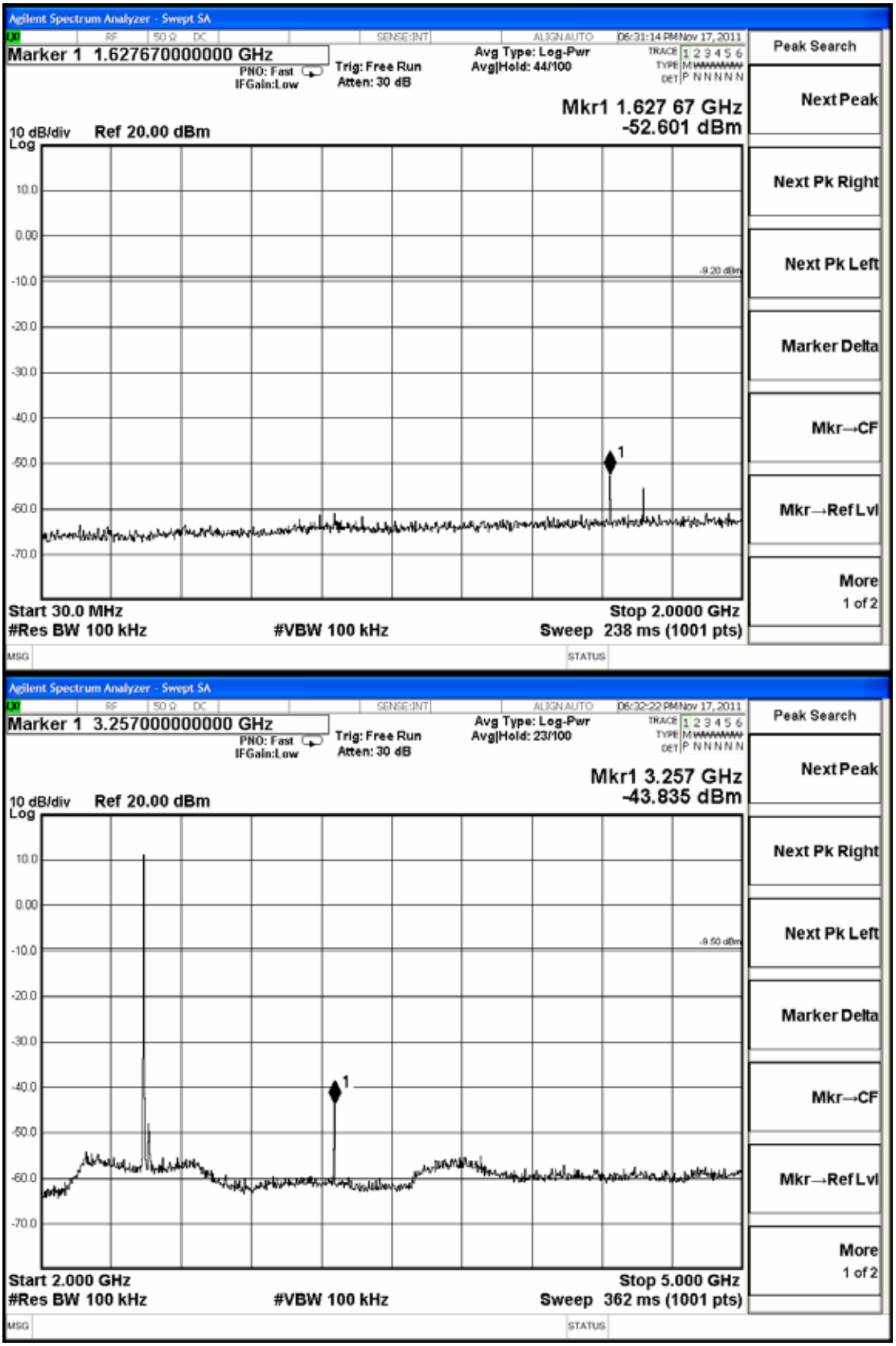


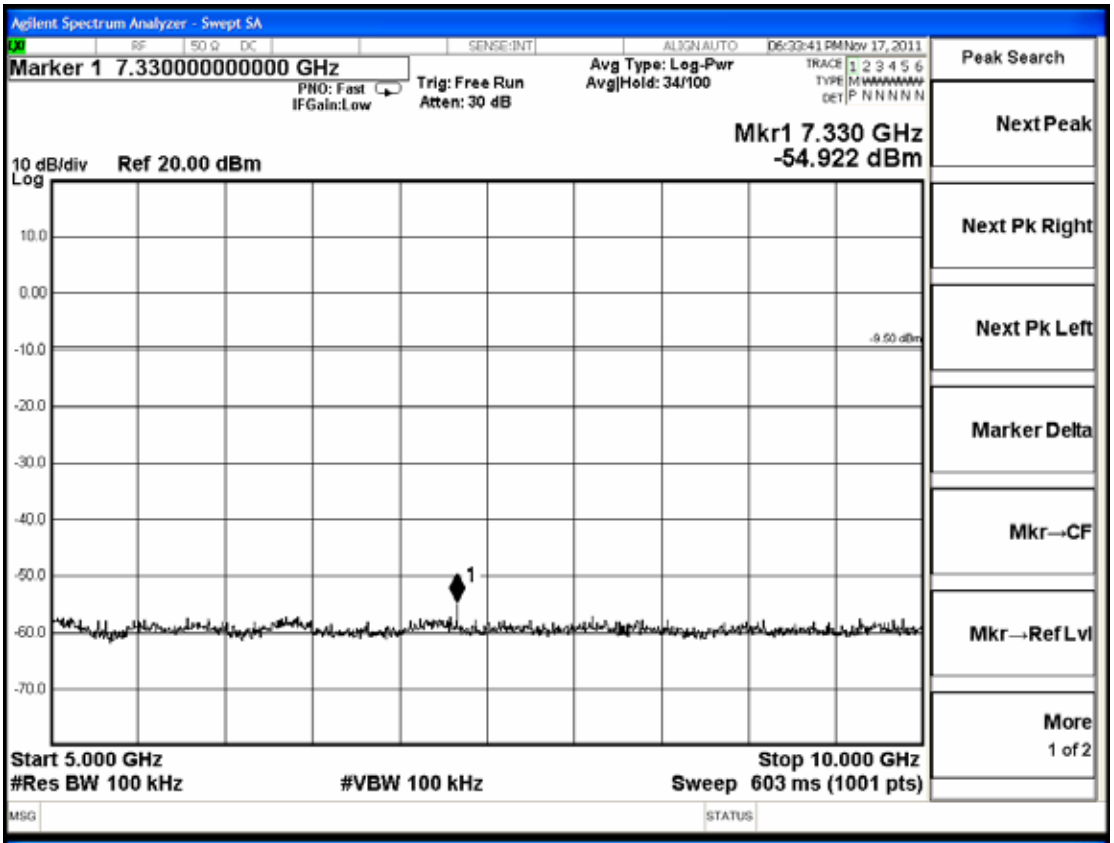

Agilent Spectrum Analyzer - Swept SA
Marker 1 7.220000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
06:27:19 PM Nov 17, 2011
Mkr1 7.220 GHz
-55.662 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Agilent Spectrum Analyzer - Swept SA
Marker 1 10.825000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 55/100
06:29:30 PM Nov 17, 2011
Mkr1 10.825 GHz
-56.652 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

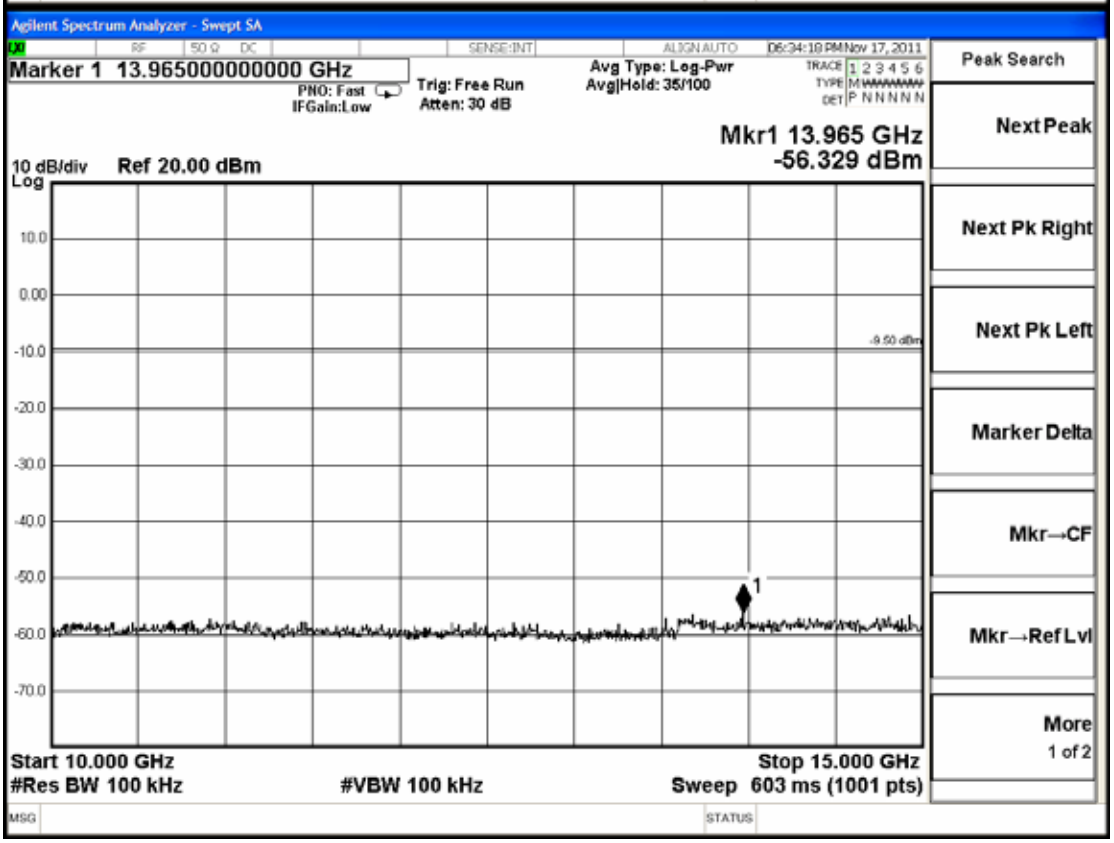

Agilent Spectrum Analyzer - Swept SA
Marker 1 18.620000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
06:29:09 PM Nov 17, 2011
Mkr1 18.620 GHz
-55.421 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

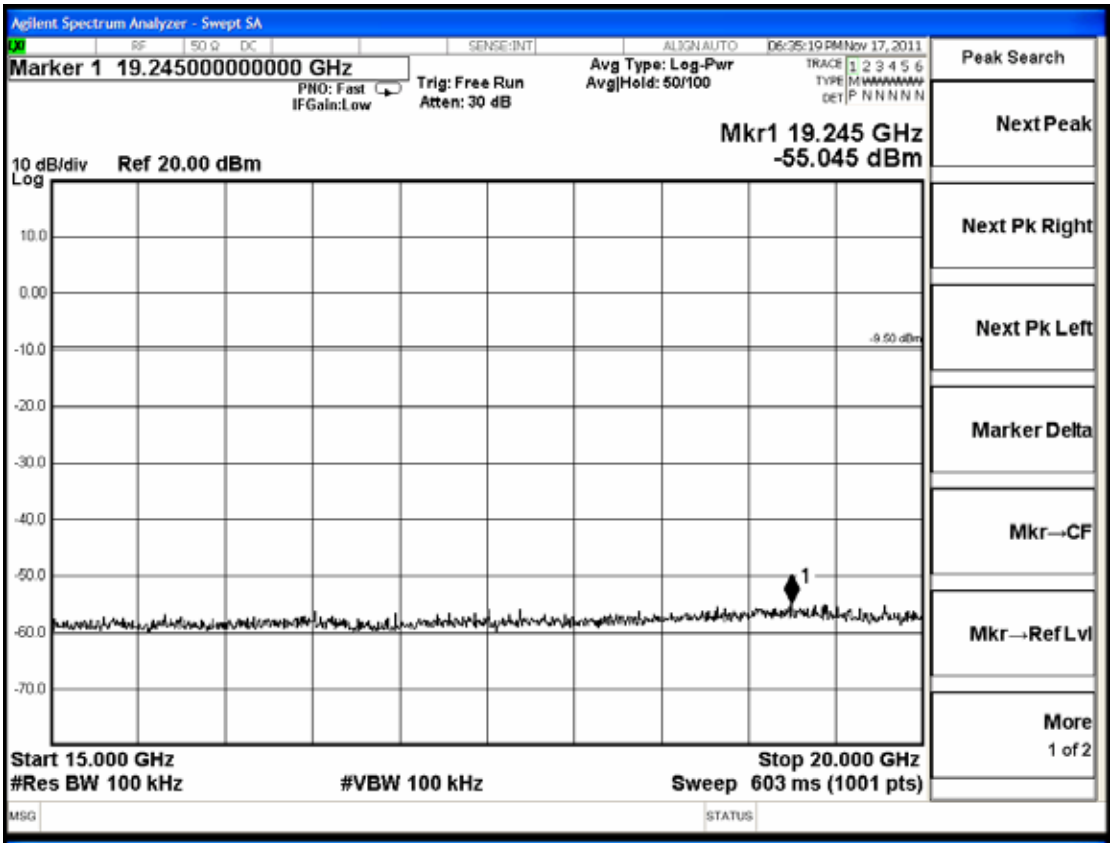

Agilent Spectrum Analyzer - Swept SA
Marker 1 23.160000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
06:30:11 PM Nov 17, 2011
Mkr1 23.160 GHz
-53.097 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

7.6.2. Channel 19, Frequency: 2442.240MHz

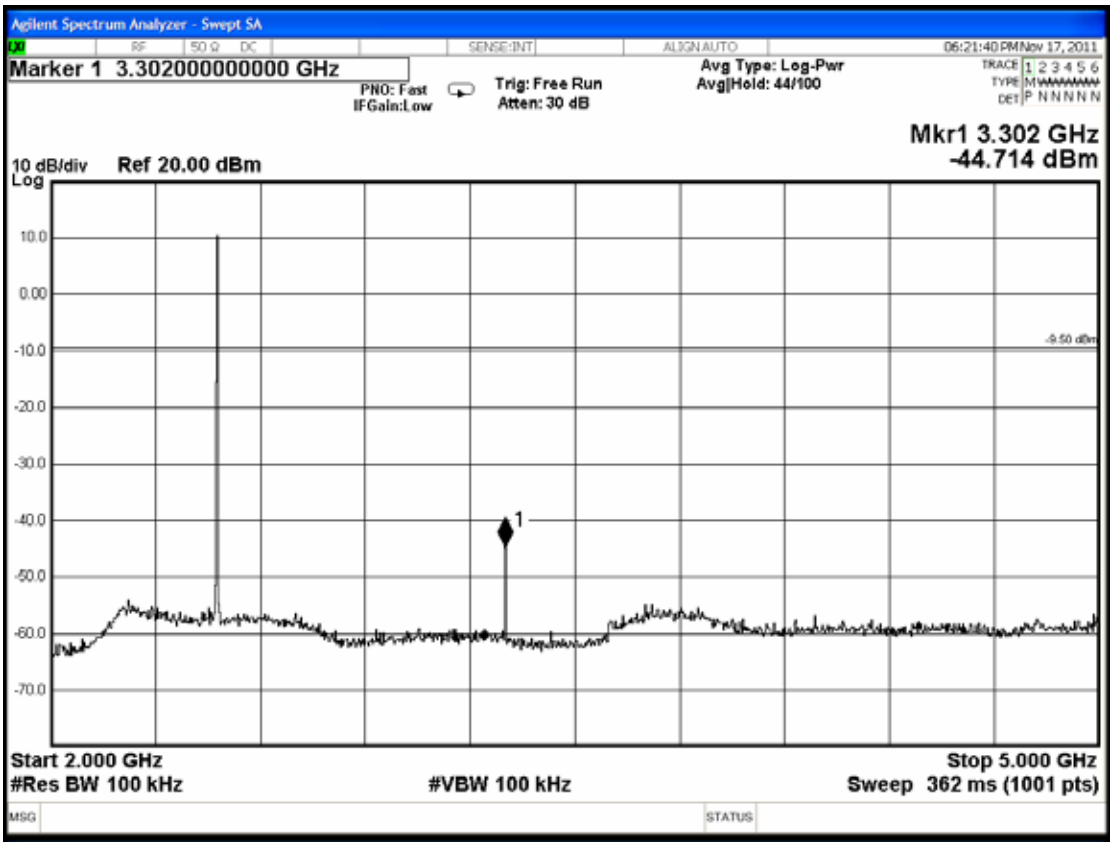


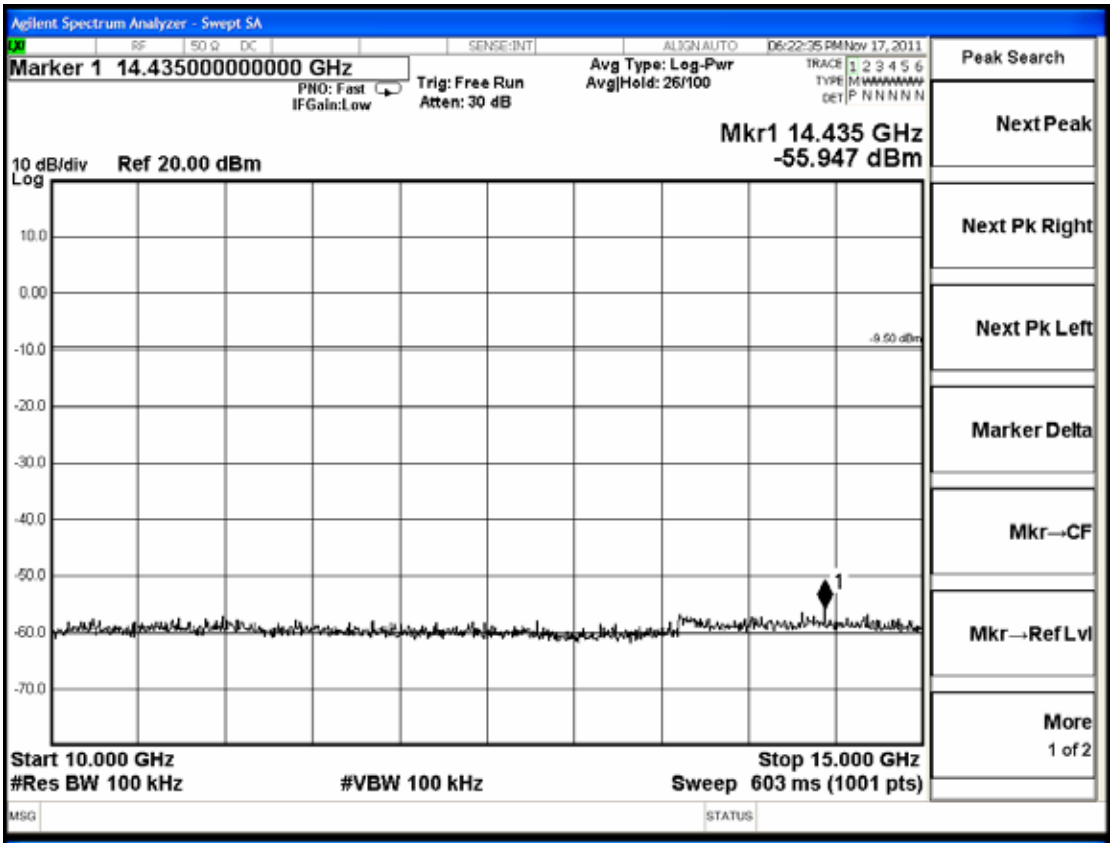

Agilent Spectrum Analyzer - Swept SA
Marker 1 7.330000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 34/100
D6:33:41 PM Nov 17, 2011
Mkr1 7.330 GHz
-54.922 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

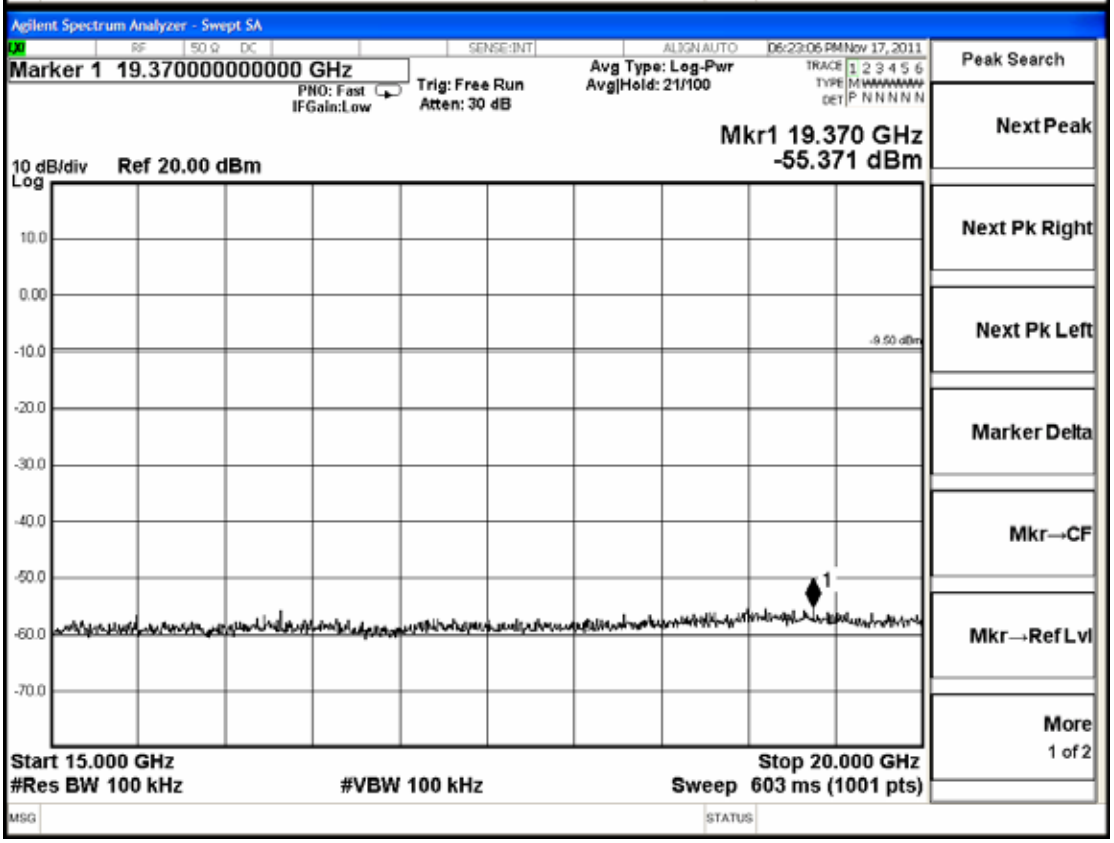

Agilent Spectrum Analyzer - Swept SA
Marker 1 13.965000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
D6:34:18 PM Nov 17, 2011
Mkr1 13.965 GHz
-56.329 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

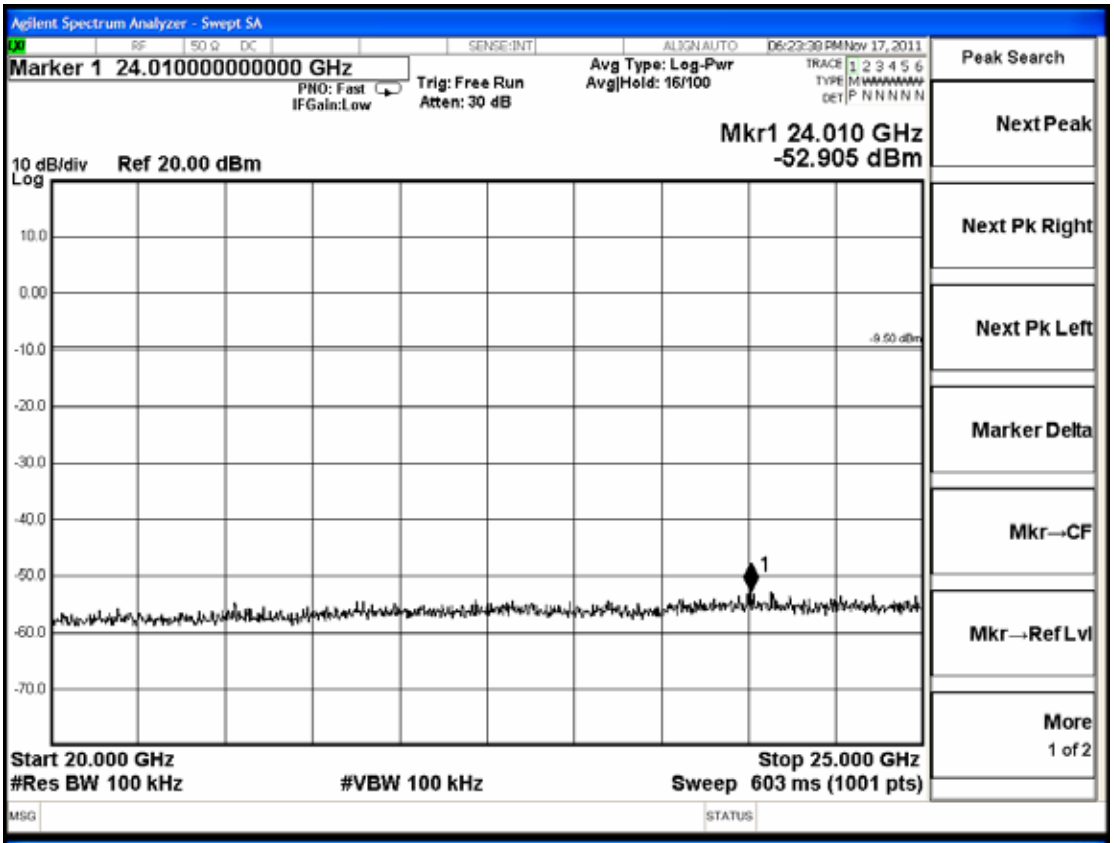

Agilent Spectrum Analyzer - Swept SA
Marker 1 19.245000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 50/100
06:05:19 PM Nov 17, 2011
Mkr1 19.245 GHz
-55.045 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Agilent Spectrum Analyzer - Swept SA
Marker 1 24.190000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 30/100
05:13:06 PM Nov 20, 2011
Mkr1 24.190 GHz
-74.184 dBm
10 dB/div
Log
Ref 0.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
File <Screen_0050.png> saved
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

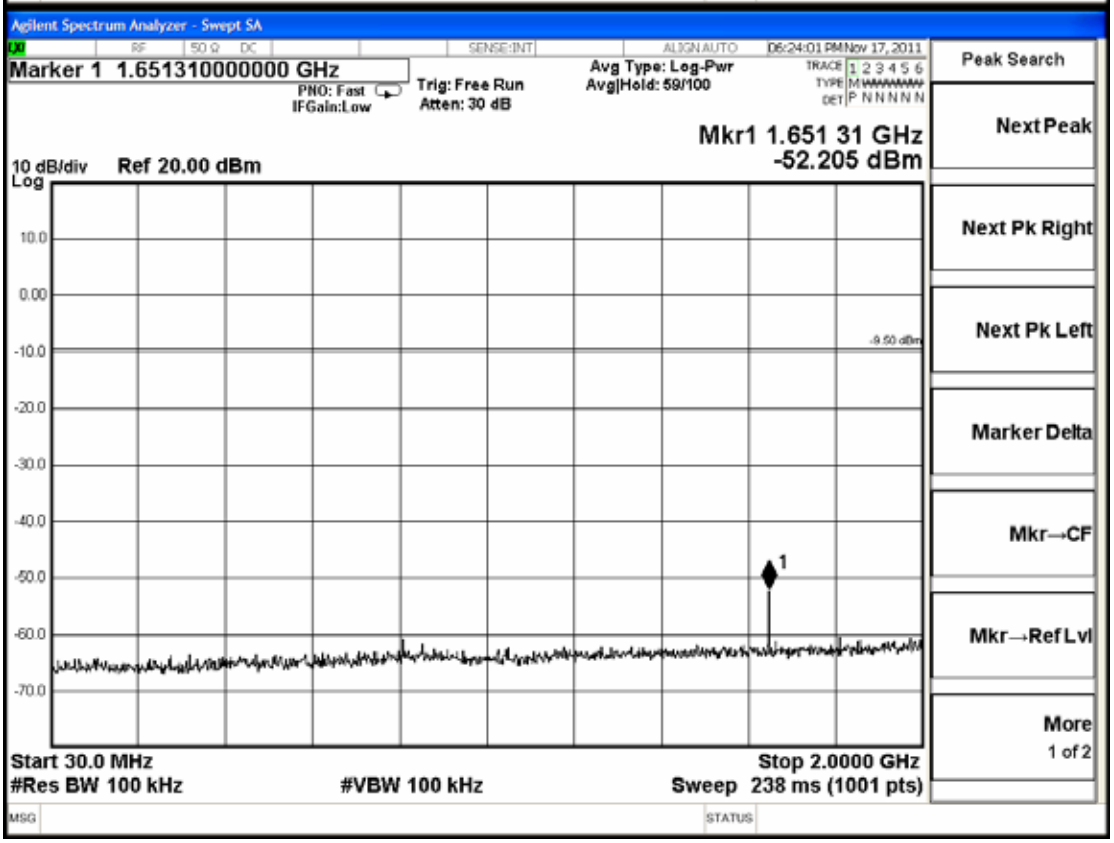
7.6.3. Channel 36, Frequency: 2477.056MHz




Agilent Spectrum Analyzer - Swept SA
Marker 1 14.435000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 26/100
06:22:35 PM Nov 17, 2011
Mkr1 14.435 GHz
-55.947 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 15.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 19.370000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
06:23:06 PM Nov 17, 2011
Mkr1 19.370 GHz
-55.371 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 15.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 20.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 24.010000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 16/100
06:23:39 PM Nov 17, 2011
Mkr1 24.010 GHz
-52.905 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 20.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 25.000 GHz
Sweep 603 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 1.651310000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
06:24:01 PM Nov 17, 2011
Mkr1 1.651 31 GHz
-52.205 dBm
10 dB/div
Log
Ref 20.00 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 2.0000 GHz
Sweep 238 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

8. BAND EDGES MEASUREMENT

8.1. 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	N9030A-544	US51350140	Oct. 14, 11'	Oct. 13, 12'

8.2. Block Diagram of Test Setup

The same as section.4.2.

8.3. Specification Limits (§15.247(c))

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

8.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 5.4 except the test set up replaced by section 8.2.

8.5. 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.
The measurement guideline was according to KDB 558074.

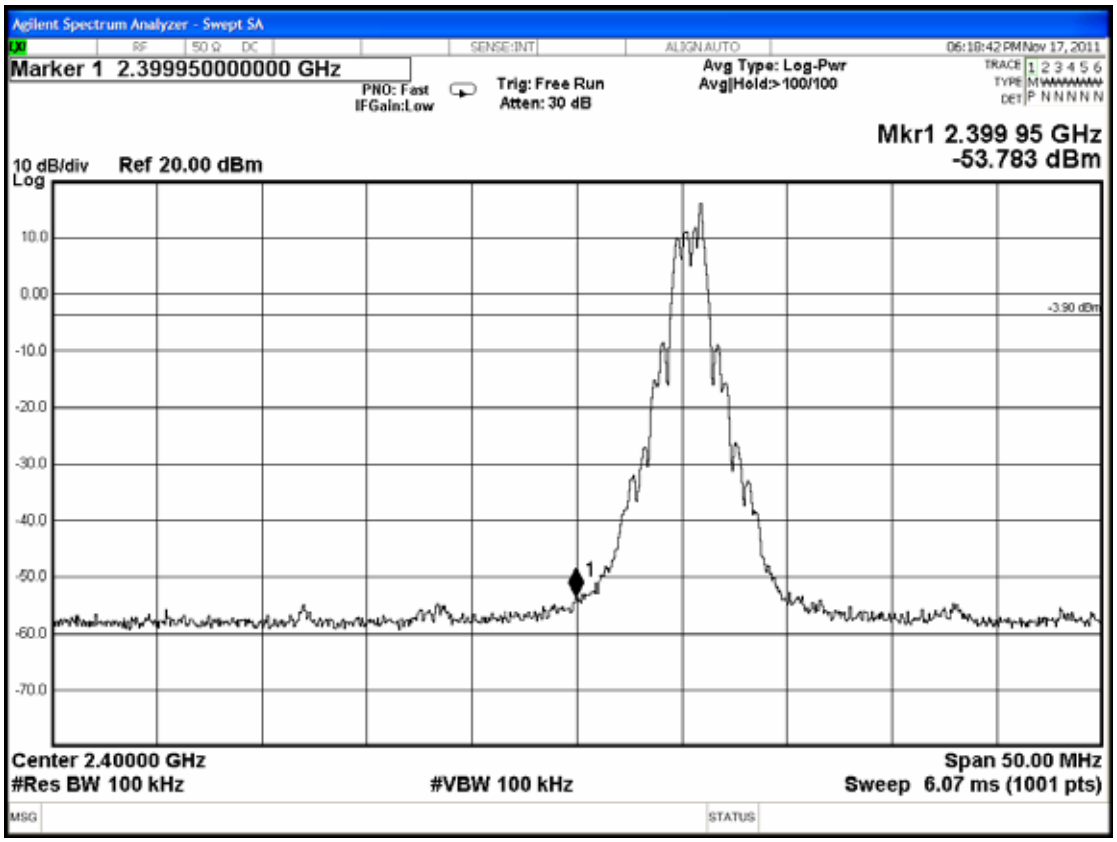
8.6. Test Results

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

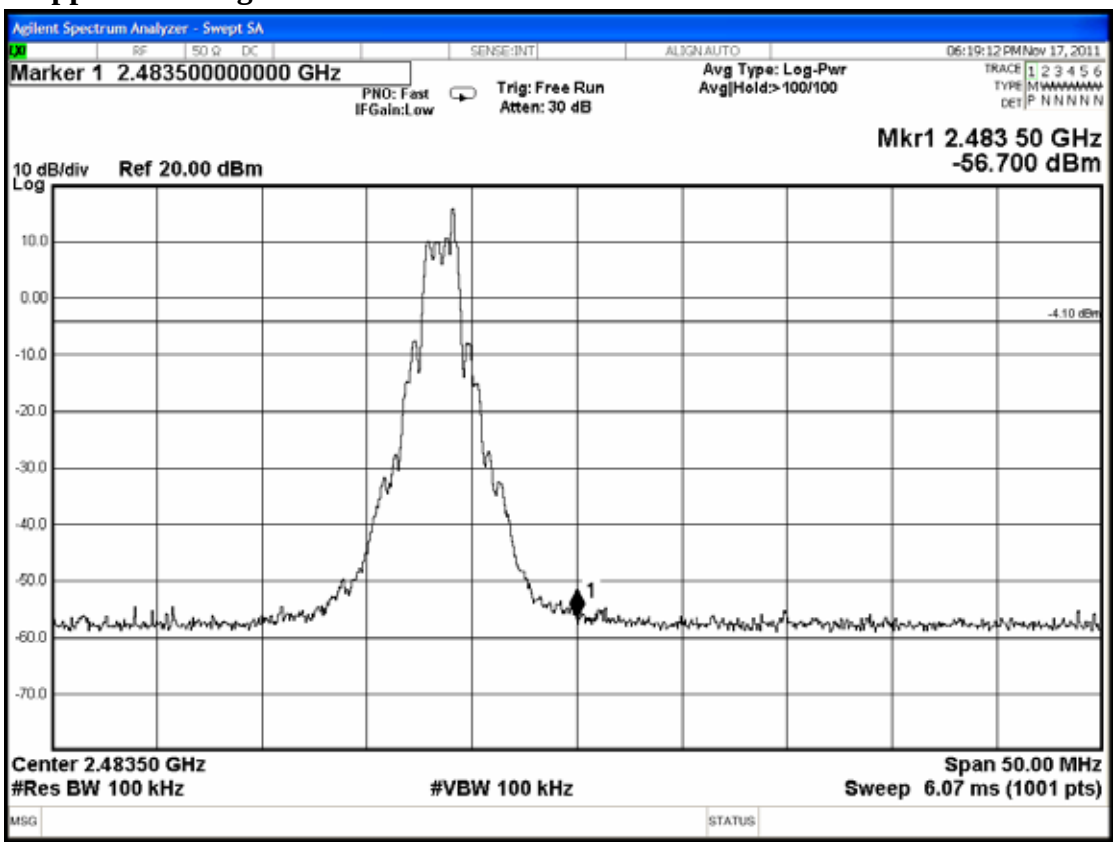
(Test Date: Nov. 17, 2011 Temperature : 25℃ Humidity : 52%)

Below Band edge: The highest emission level is –53.783dBm on 2.39990GHz。
Upper Band edge : The highest emission level is –56.700dBm on 2.48350GHz。

Below Band edge



Upper Band edge



9. POWER SPECTRAL DENSITY MEASUREMENT

9.1. 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	N9030A-544	US51350140	Oct. 14, 11’	Oct. 13, 12’

9.2. Block Diagram of Test Setup

The same as section.4.2.

9.3. 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.

9.4. Operating Condition of EUT

Same as 6dB bandwidth measurement which was listed in 5.4 except the test set up replaced by section 9.2.

9.5. 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.
The measurement guideline was according to KDB 558074.

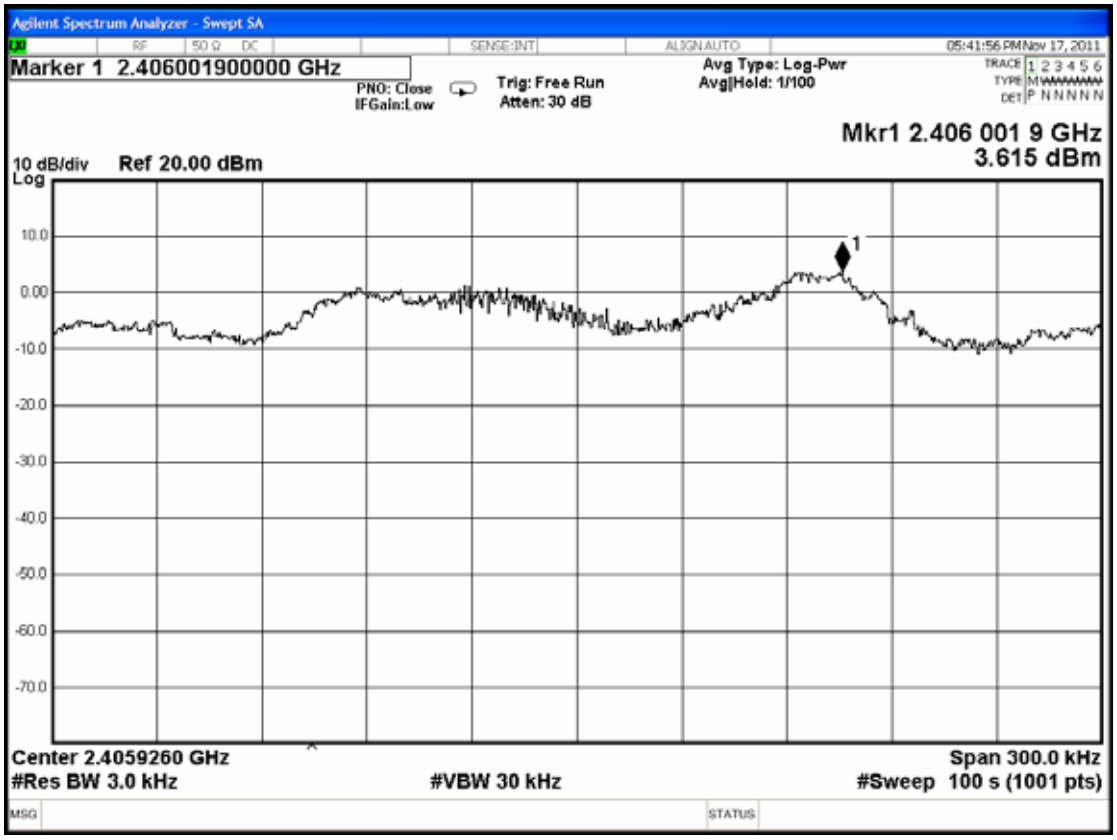
9.6. Test Results

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

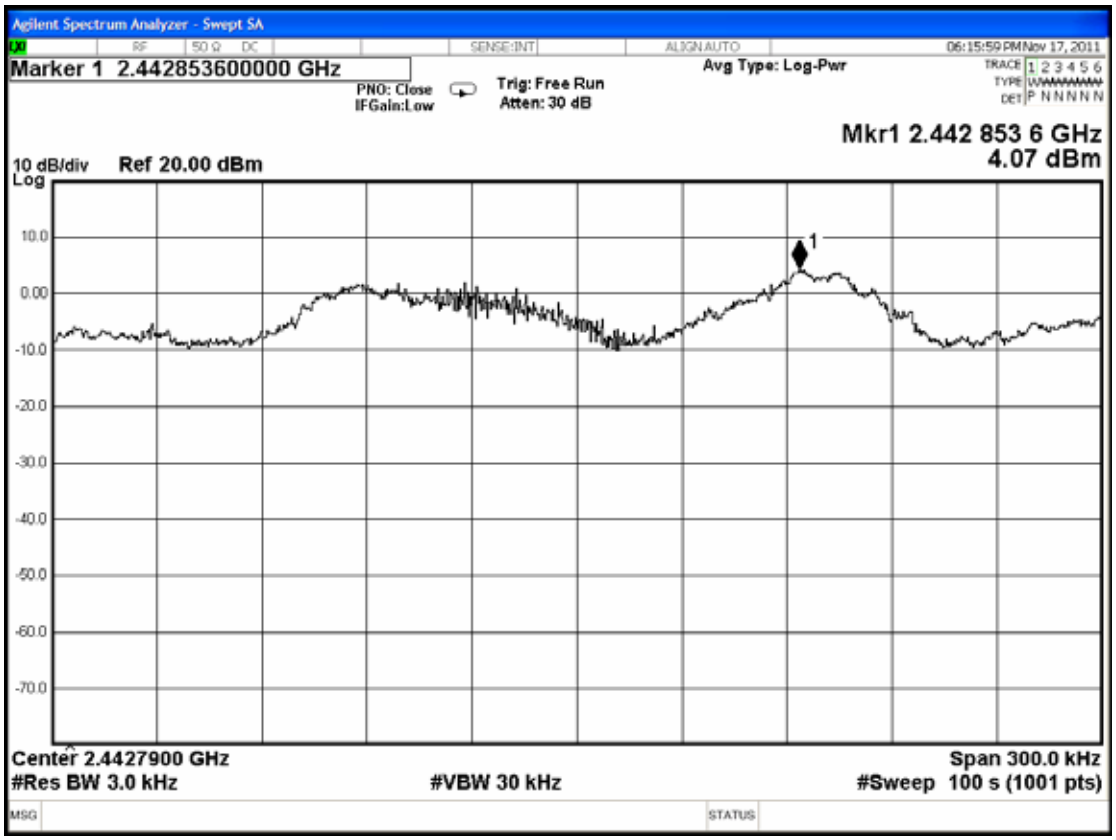
(Test Date: Nov. 17, 2011 Temperature : 23℃ Humidity : 57%)

No.	Channel	Test Frequency	**Power Spectral Density (dBm)**	Limit
1.	CH 01	2405.926MHz	**3.615dBm**	8dBm
2.	CH 19	2442.790MHz	**4.070dBm**	8dBm
3.	CH 36	2477.556MHz	**3.760dBm**	8dBm

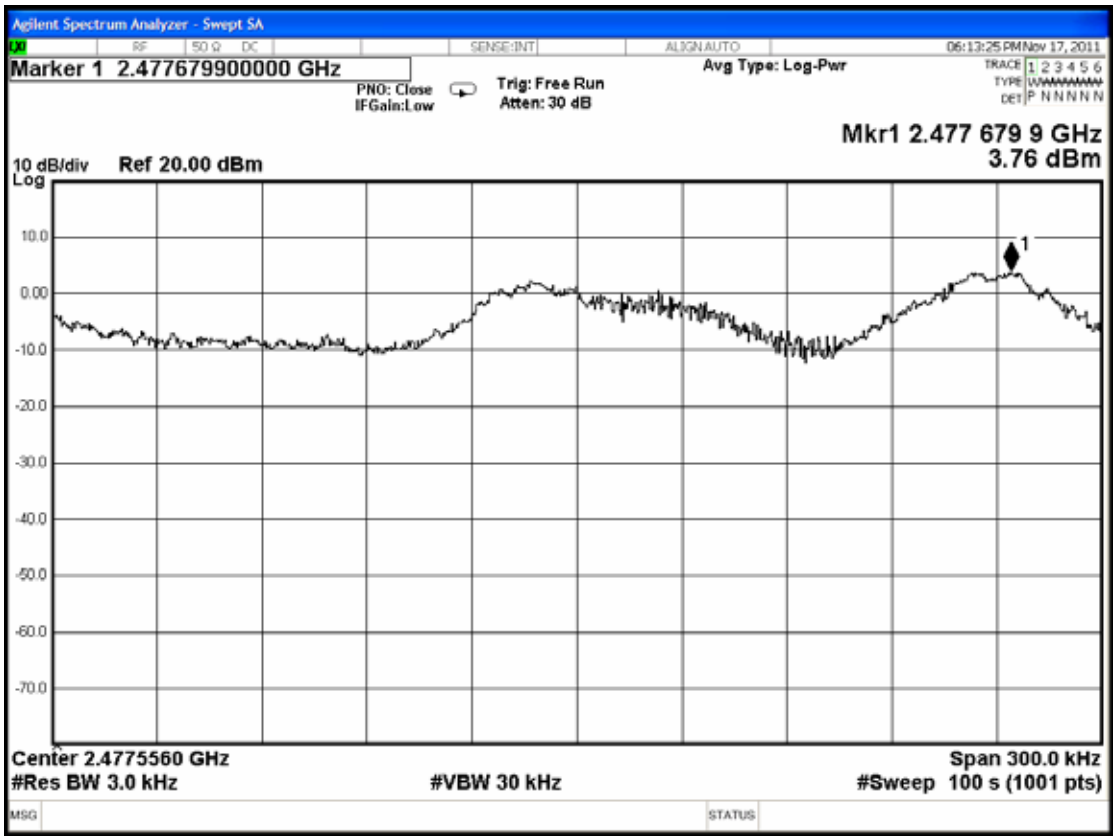
9.6.1. Channel 01, Frequency: 2405.376MHz



9.6.2. Channel 19, Frequency: 2442.240MHz



9.6.3. Channel 36, Frequency: 2477.056MHz



10. DEVIATION TO TEST SPECIFICATIONS

【NONE】