

4.4 HOPPING CHANNEL SEPARATION

4.4.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25KHz or 20dB bandwidth (whichever is greater).

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 24, 2003

Notes:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.4.4 TEST SETUP

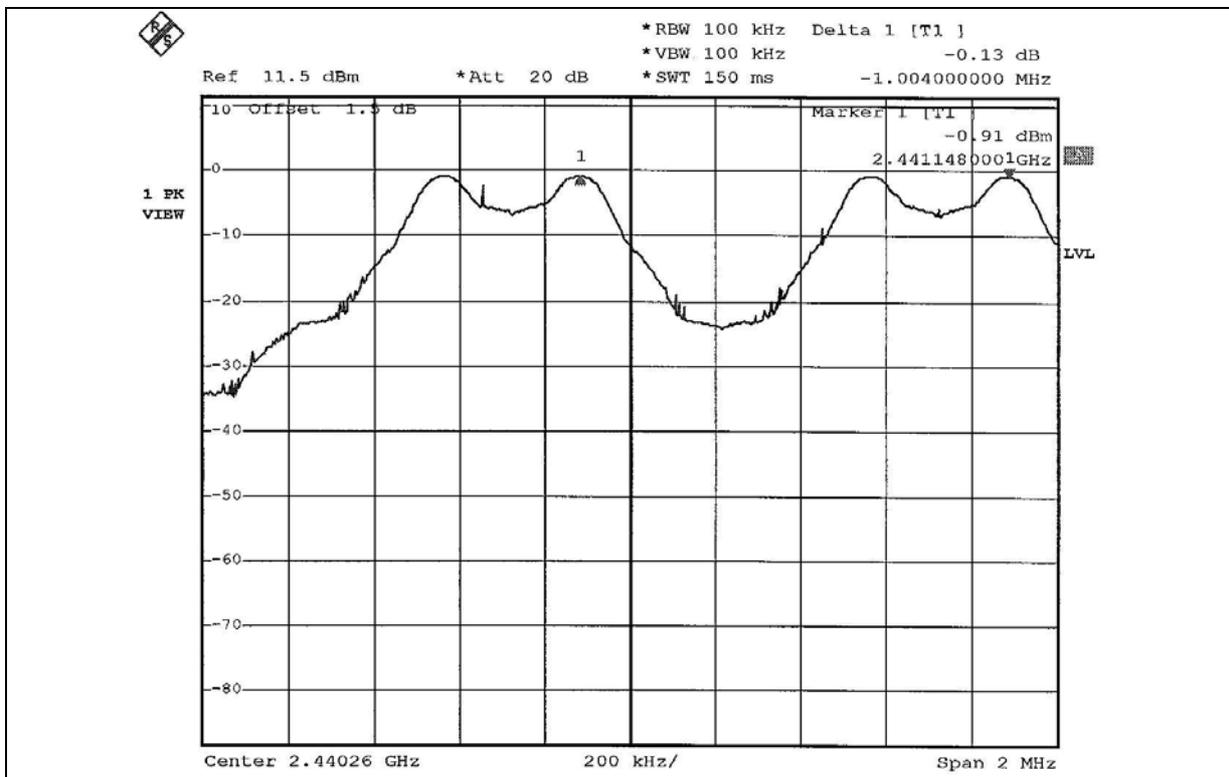
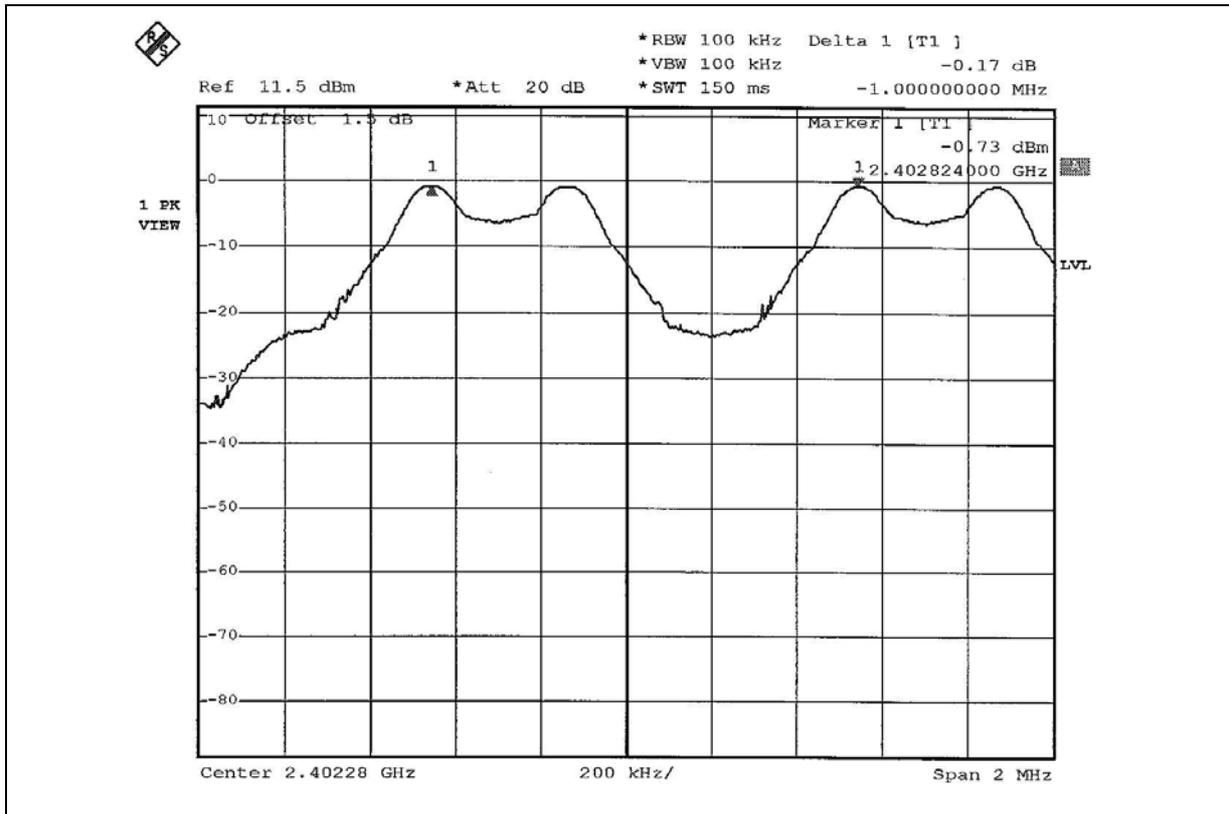


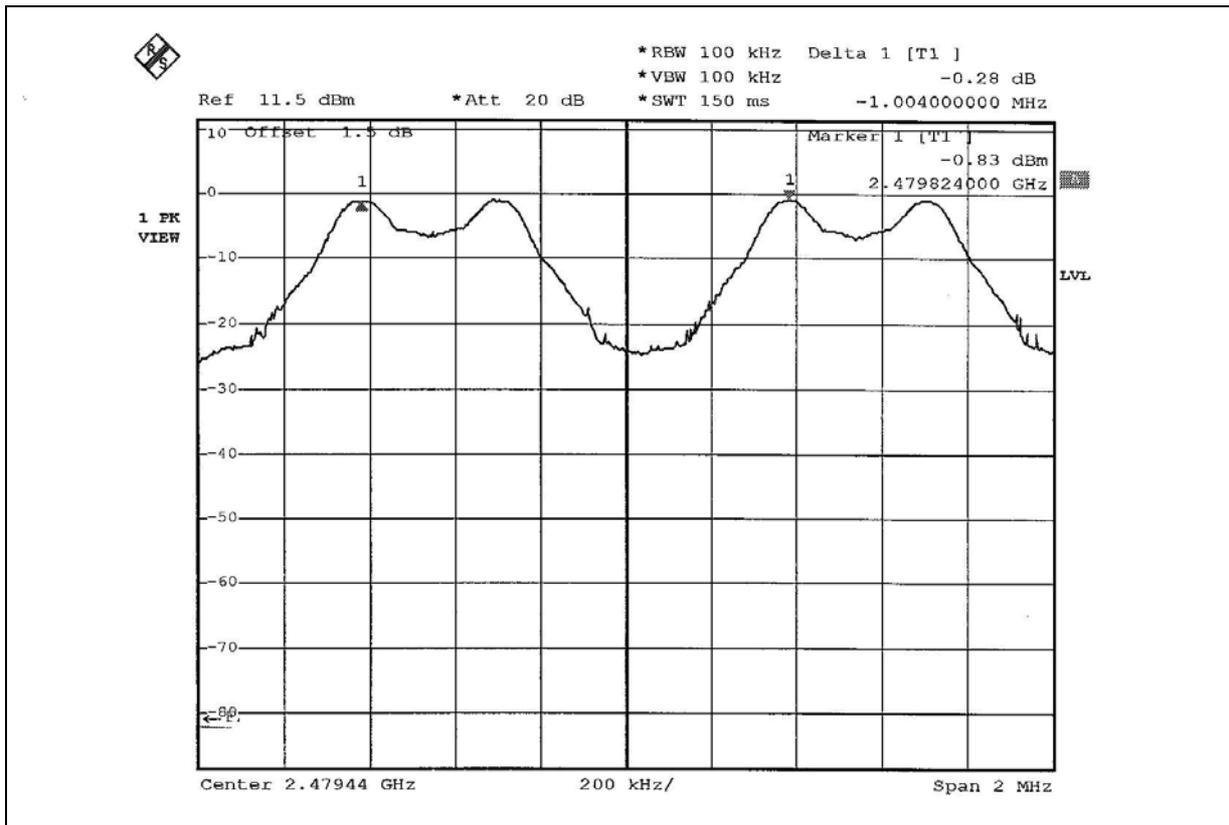


4.4.5 TEST RESULTS (A)

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	645.00	pass
39	2441	1MHz	591.00	pass
78	2480	1MHz	624.00	pass

The minimum limit is 20dB bandwidth. Test results please refer to next two pages.



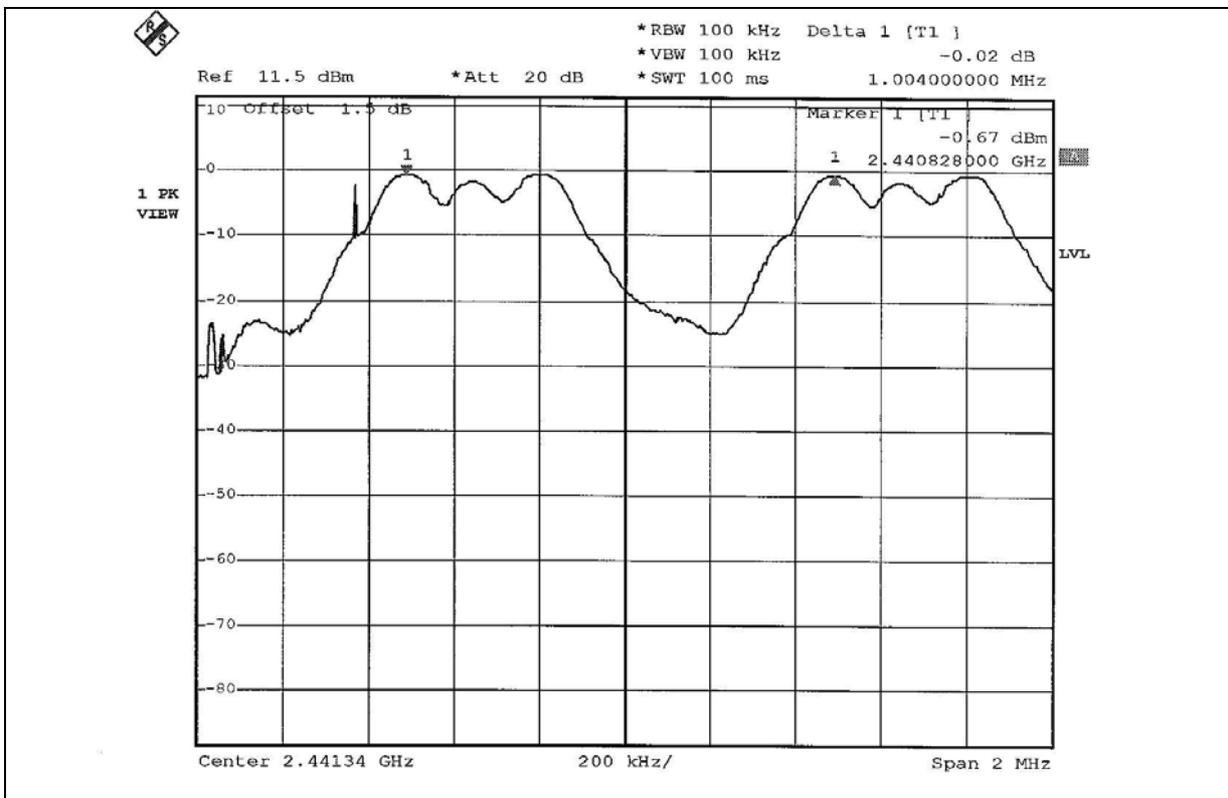
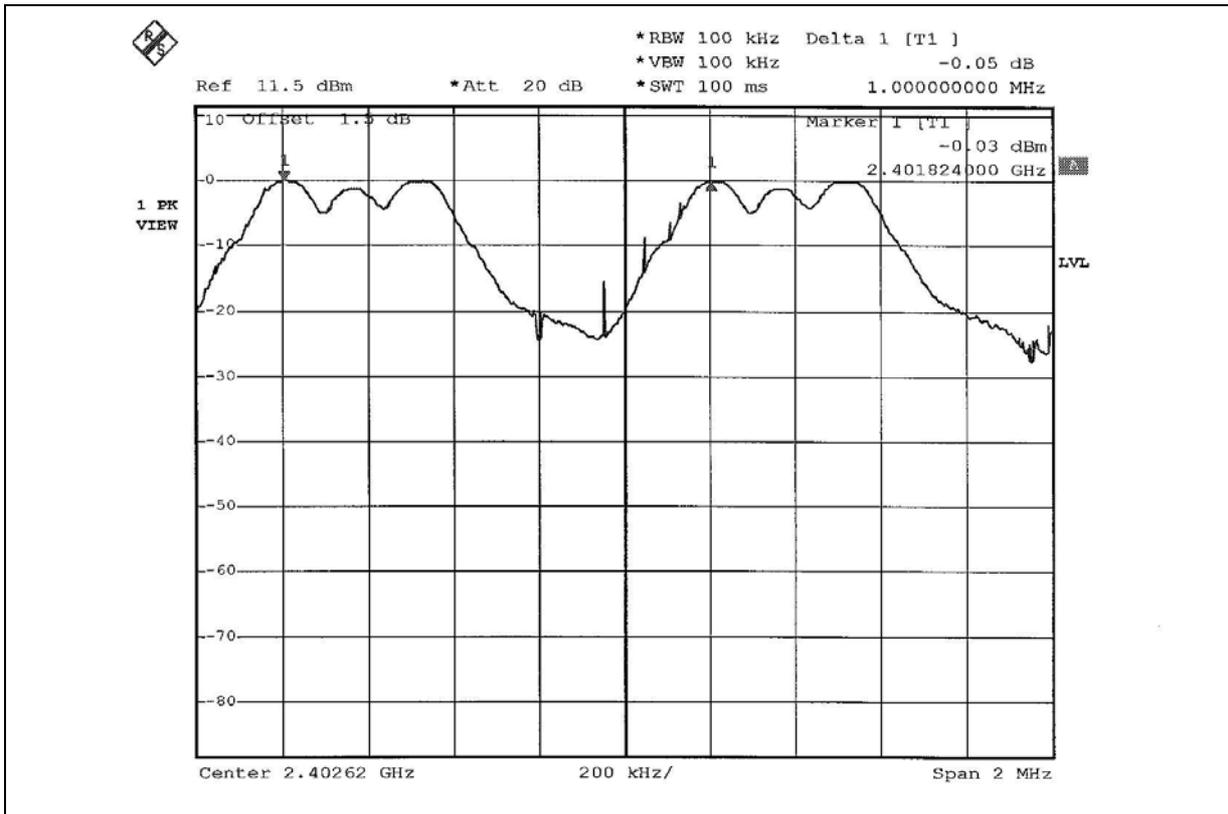


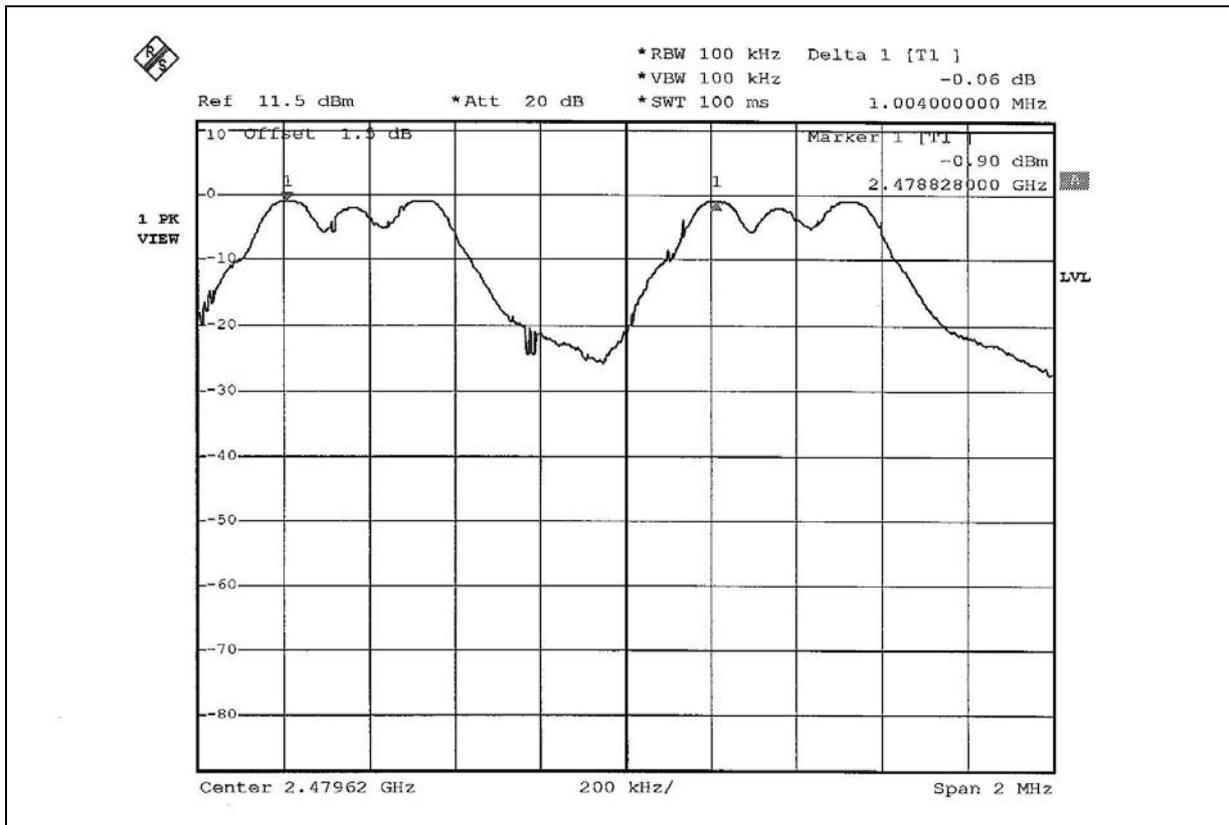


4.4.6 TEST RESULTS (B)

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	591.00	pass
39	2441	1MHz	594.00	pass
78	2480	1MHz	594.00	pass

The minimum limit is 20dB bandwidth. Test results please refer to next two pages.





4.5 CHANNEL BANDWIDTH

4.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 24, 2003

Notes:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

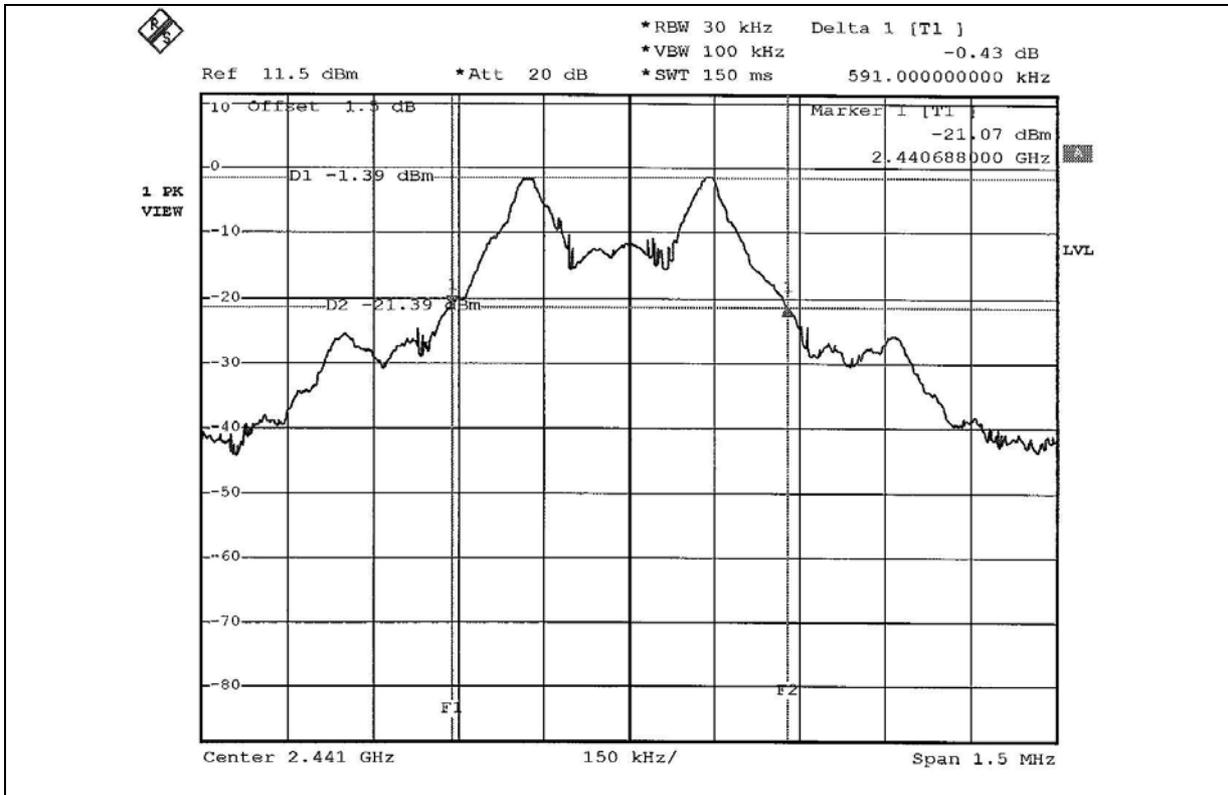
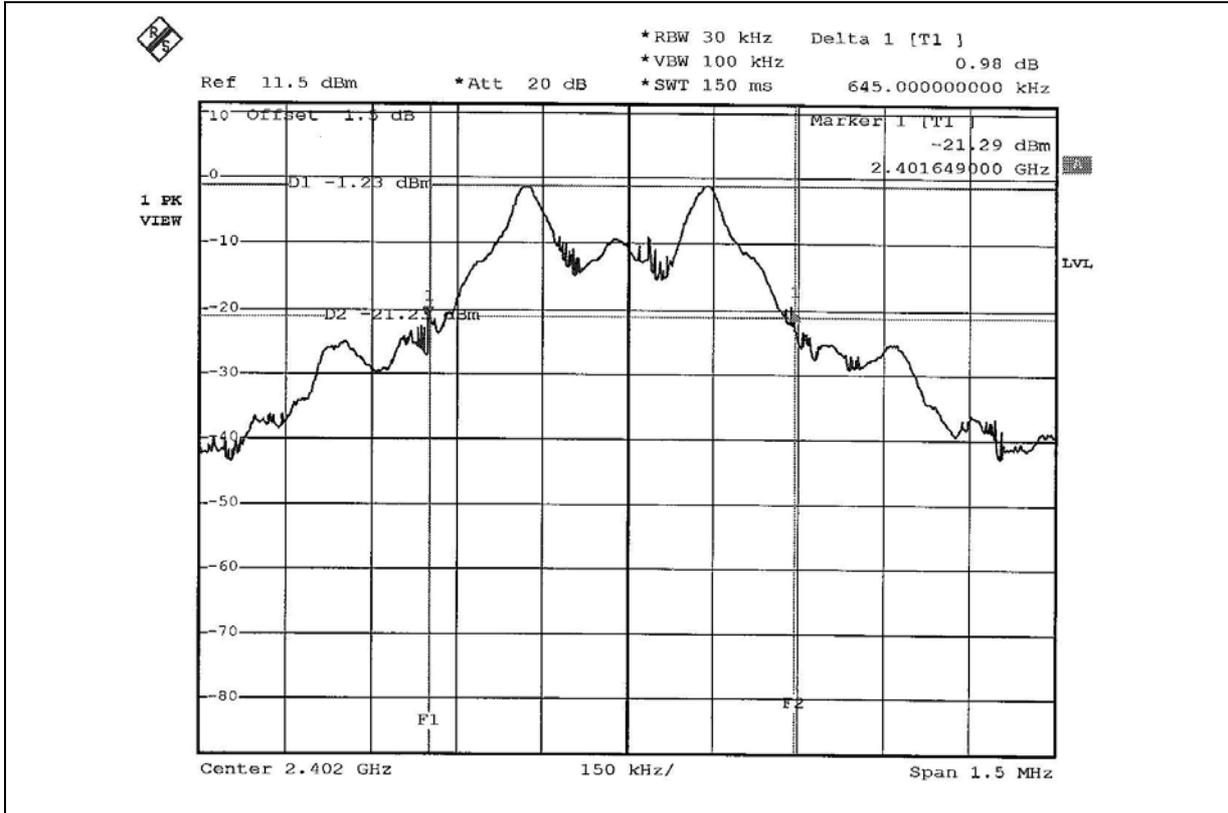
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

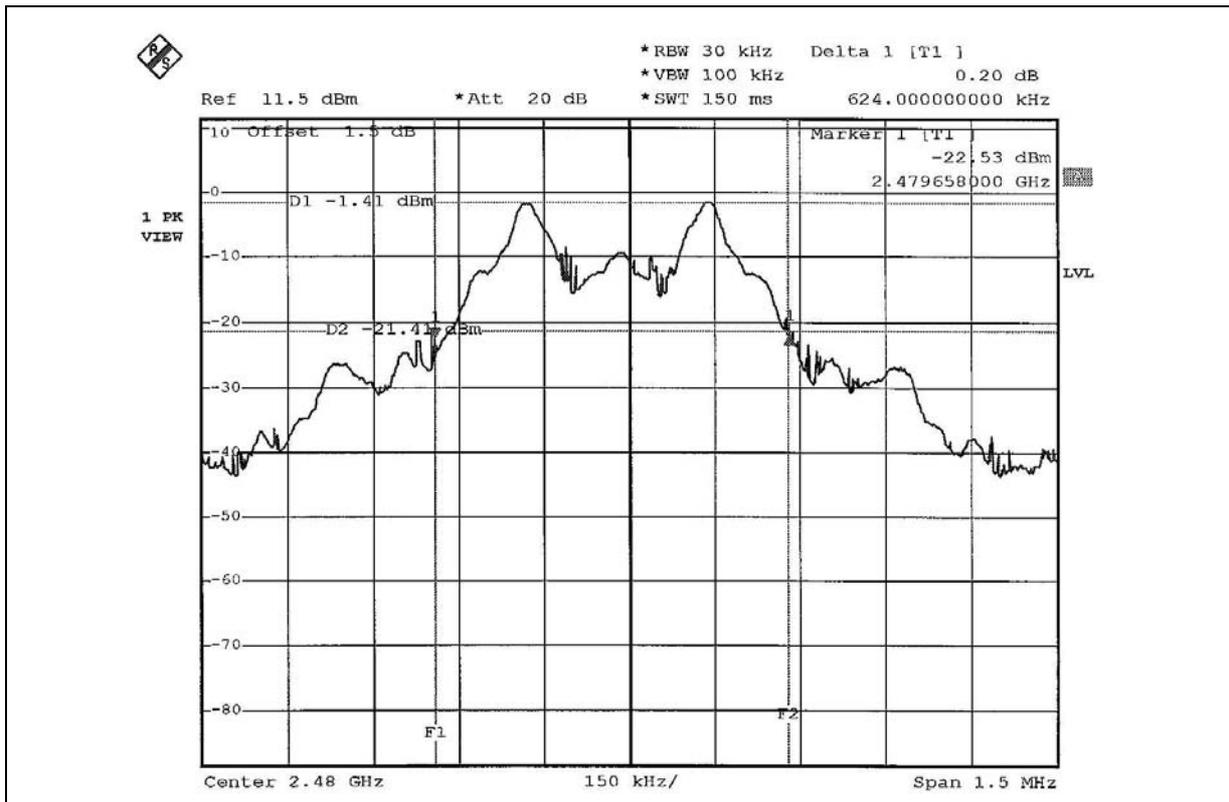


4.5.6 TEST RESULTS (A)

EUT	Wireless JoyStick	MODEL	J-UE16
Environmental Conditions	27 deg. C, 60% RH	Tested By	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	645.00	1	PASS
39	2441	591.00	1	PASS
78	2480	624.00	1	PASS

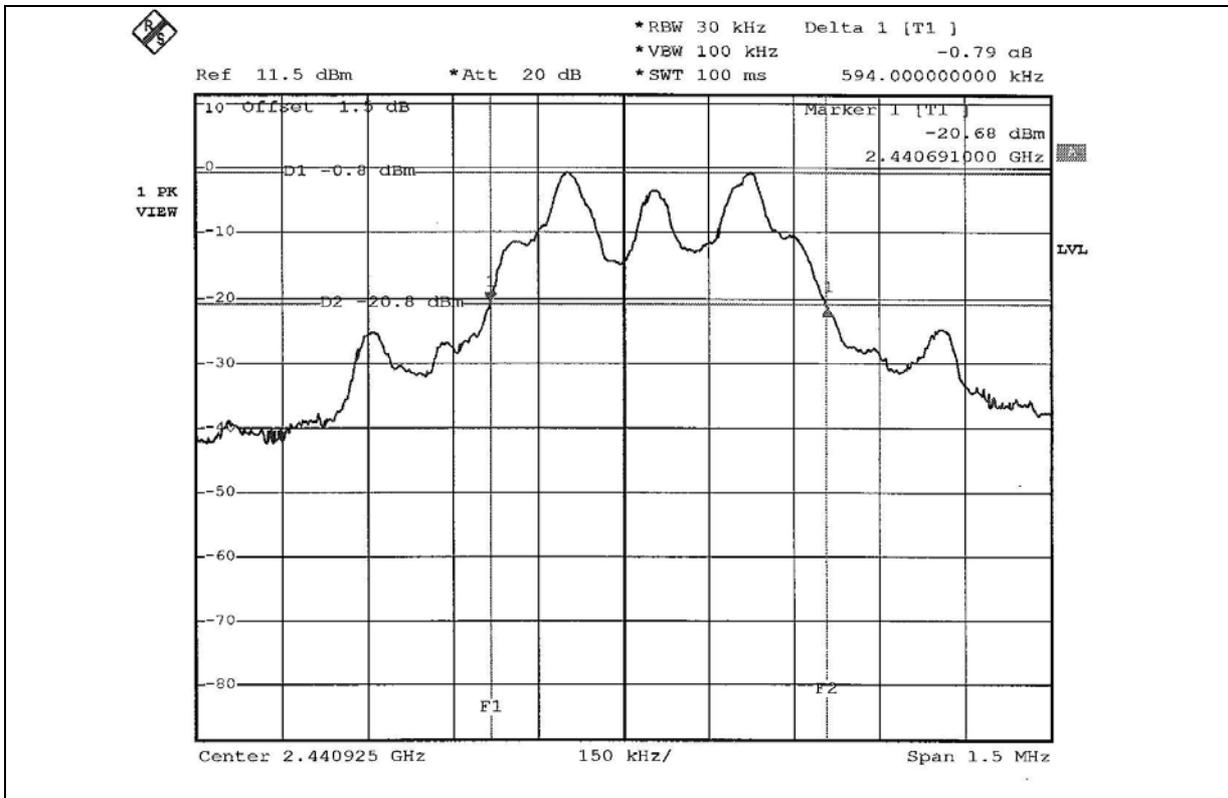
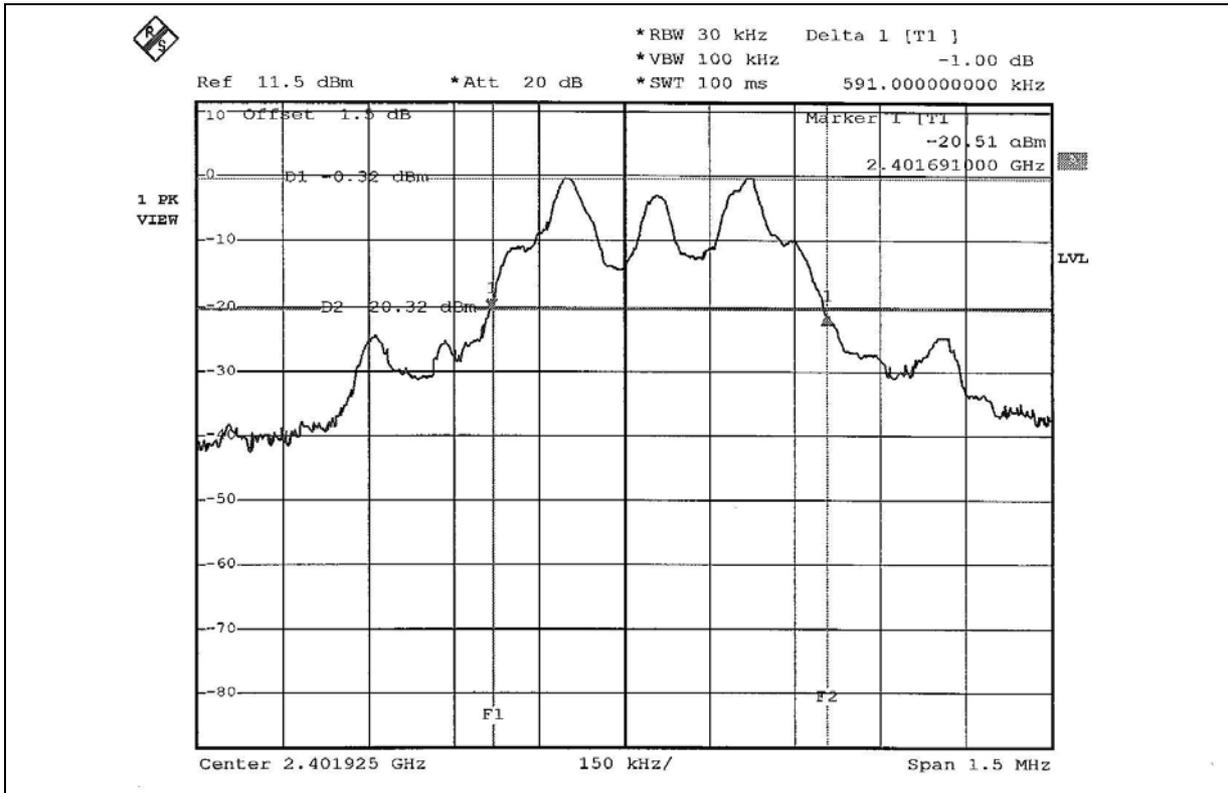


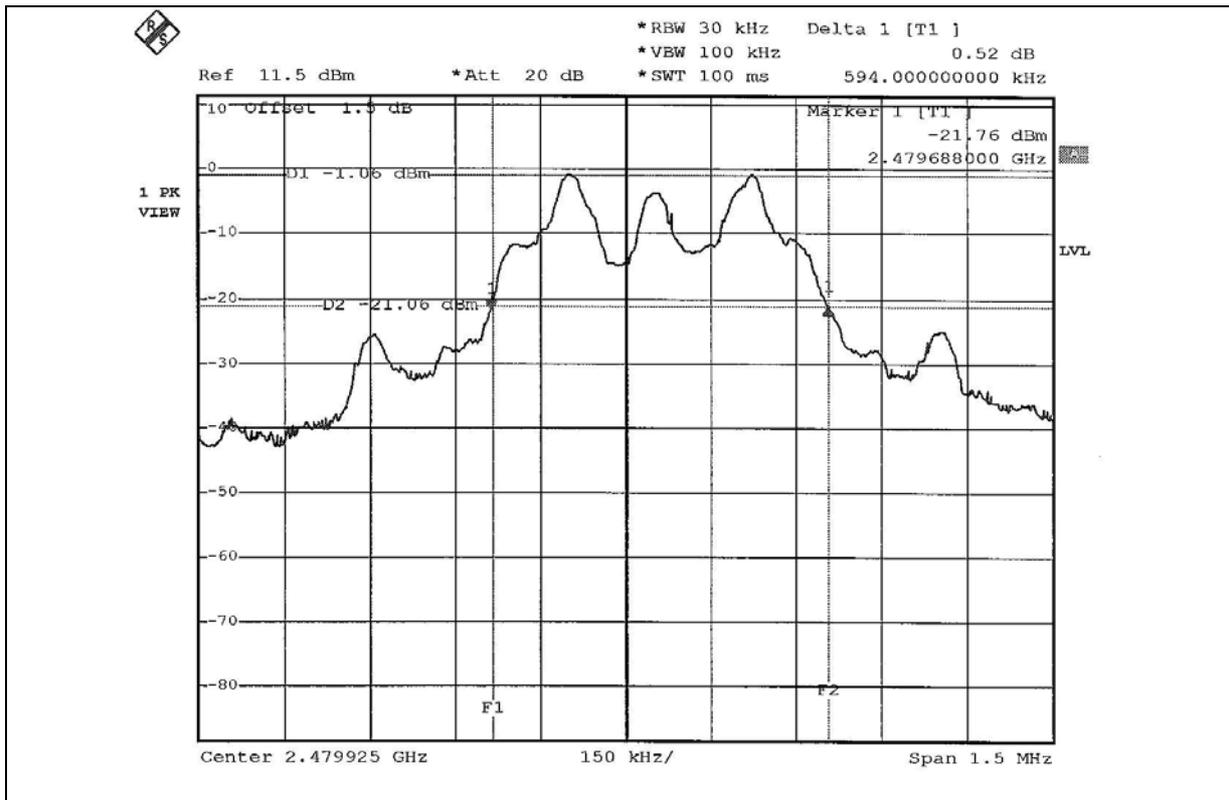


4.5.7 TEST RESULTS (B)

EUT	Wireless JoyStick	MODEL	C-UG10b
Environmental Conditions	26 deg. C, 60% RH	Tested By	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	591.00	1	PASS
39	2441	594.00	1	PASS
78	2480	594.00	1	PASS







4.6 MAXIMUM PEAK OUTPUT POWER

4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Limit of Maximum Peak Output Power Measurement is 30dBm.

4.6.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 24, 2003

Notes:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 2 MHz RBW and 3 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

4.6.4 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.6.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

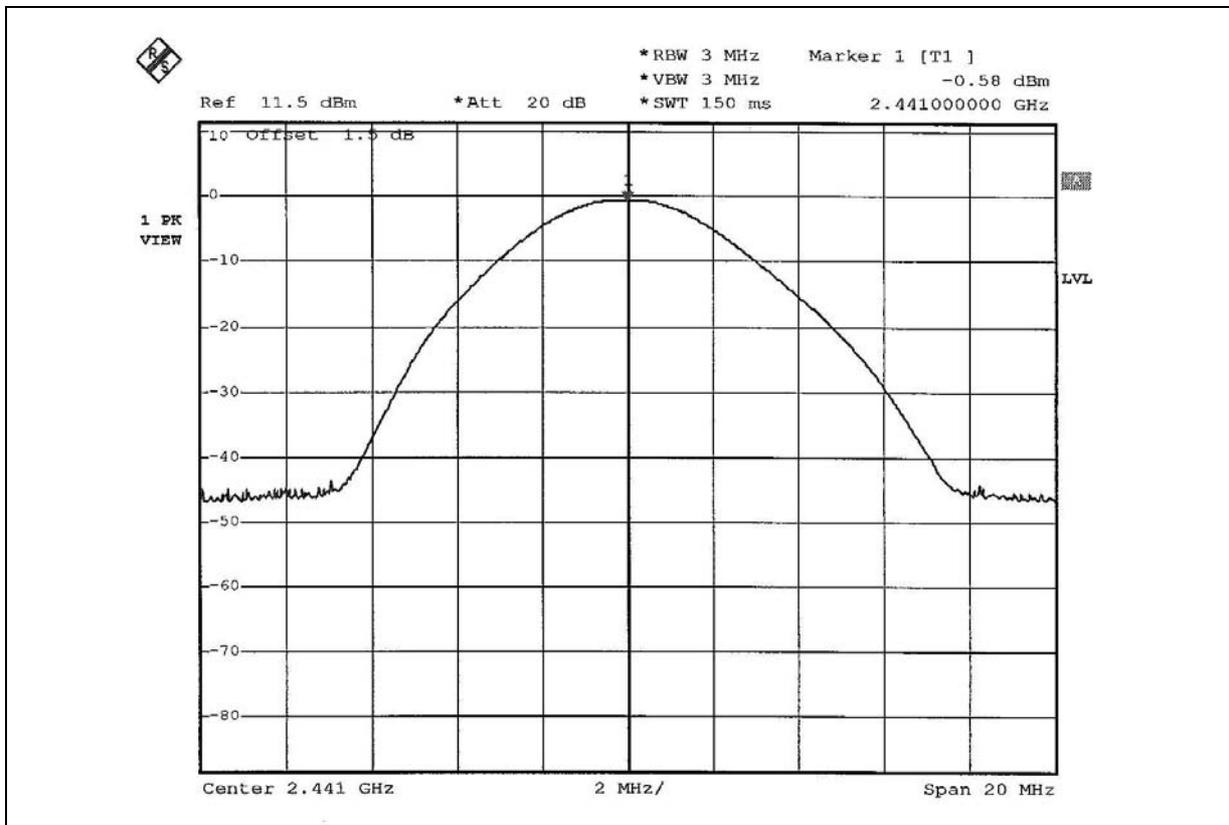
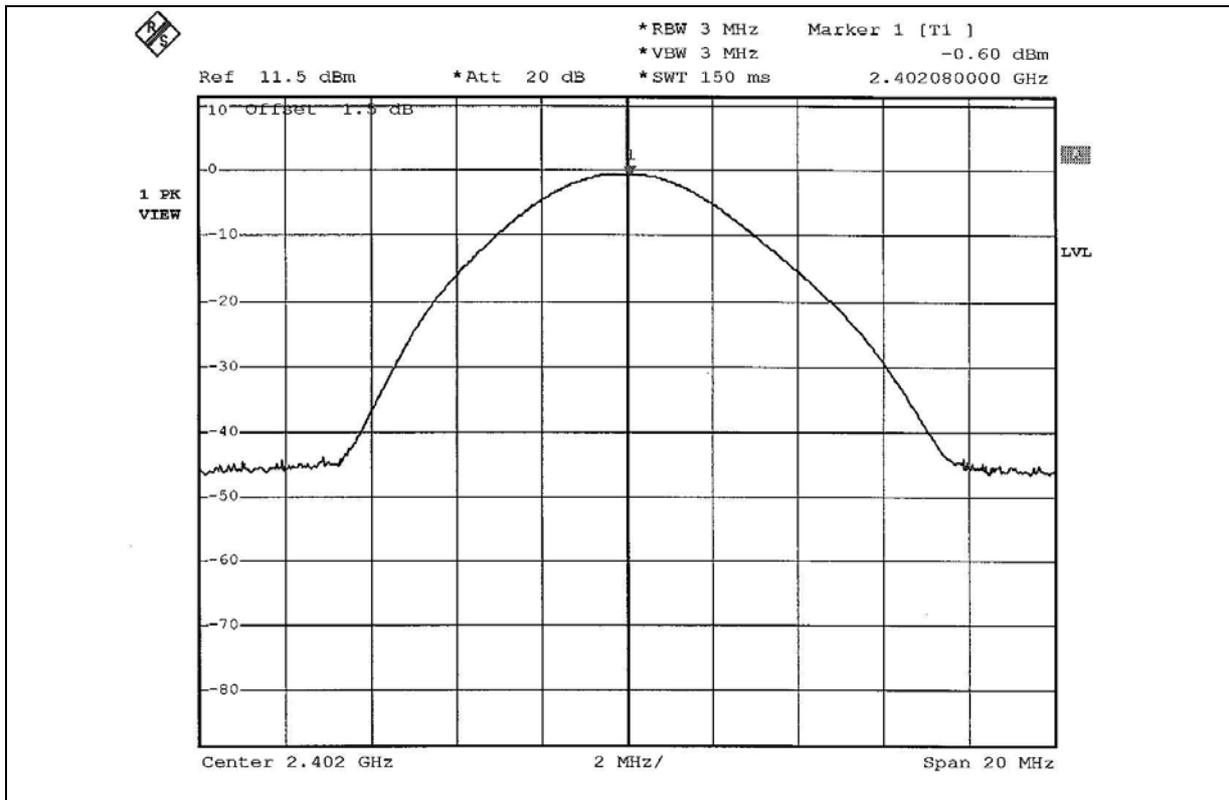


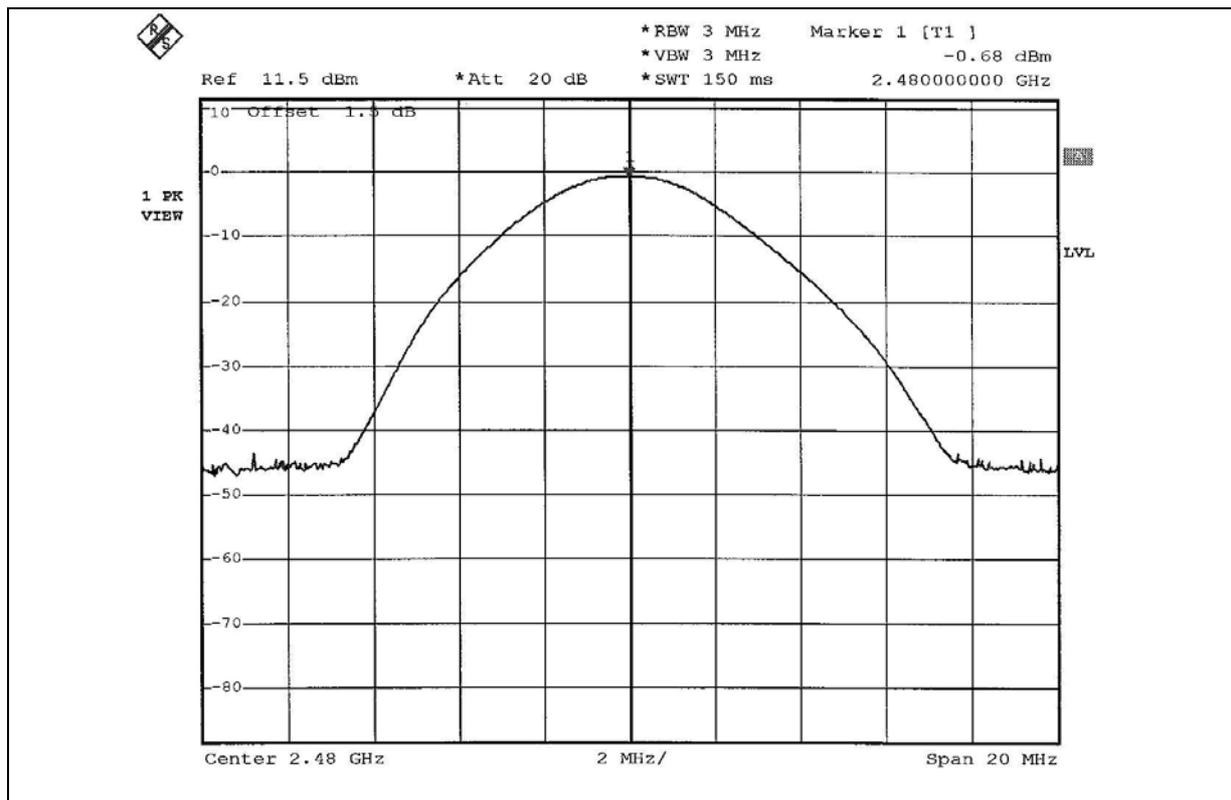
4.6.6 TEST RESULTS (A)

Output Power Into Antenna:

EUT	Wireless JoyStick	MODEL	J-UE16
Environmental Conditions	26 deg. C, 60%RH	Tested By	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	-0.60	30	PASS
39	2441	-0.58	30	PASS
78	2480	-0.68	30	PASS





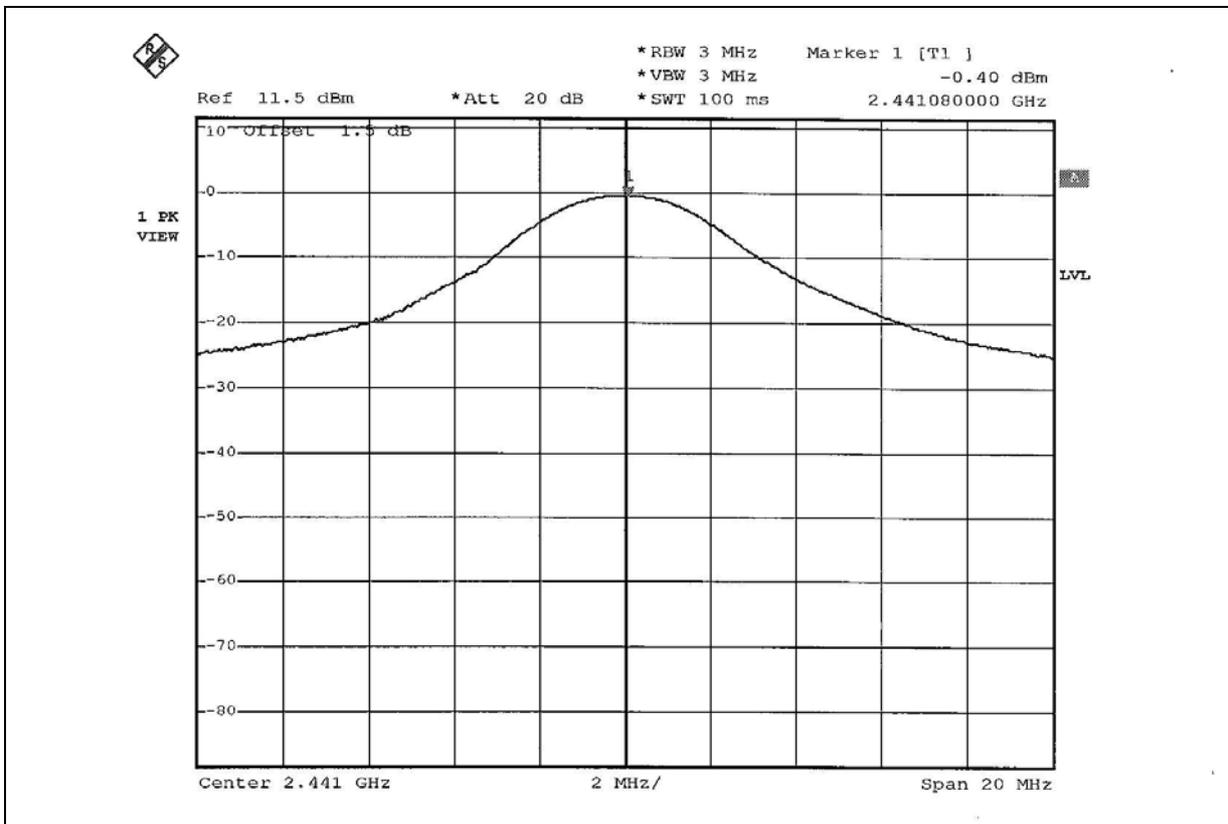
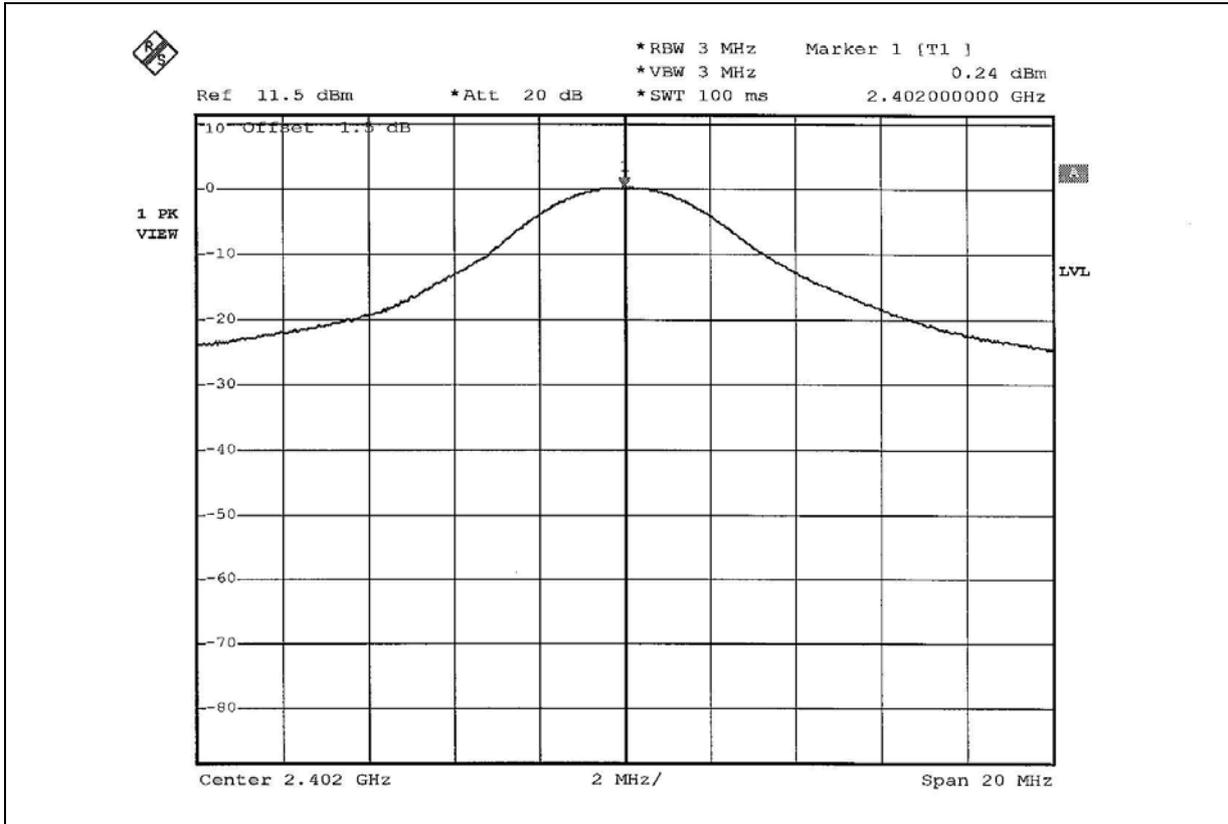


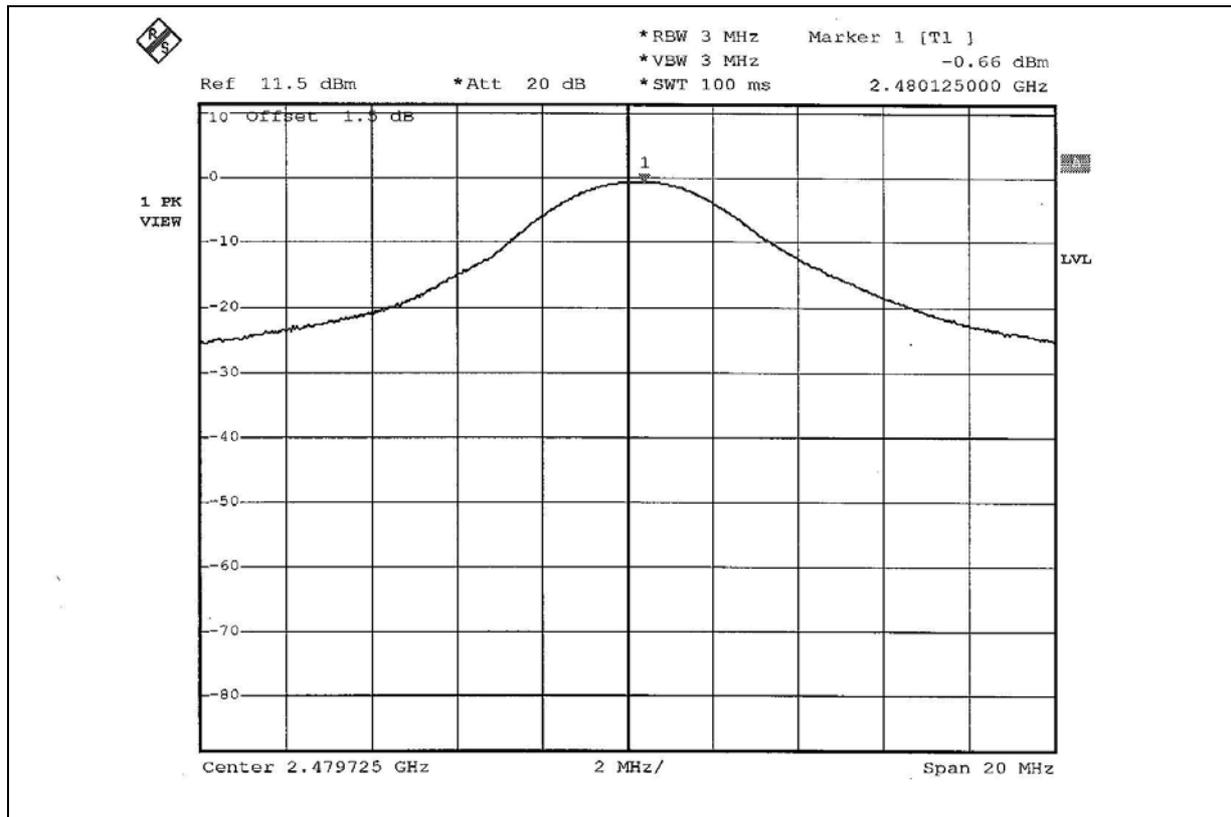
4.6.7 TEST RESULTS (B)

Output Power Into Antenna:

EUT	Wireless JoyStick	MODEL	C-UG10b
Environmental Conditions	26 deg. C, 60%RH	Tested By	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	0.24	30	PASS
39	2441	-0.40	30	PASS
78	2480	-0.66	30	PASS





4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jul. 3, 2003
* EMCO Horn Antenna	3115	9312-4192	Apr. 9, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jul. 12, 2003
Open Field Test Site	Site 5	ADT-R05	Jul. 19, 2003
VCCI Site Registration No.	Site 5	R-1039	NA

- NOTE:** 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
3. "*" = These equipment are used for the final measurement.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The test was performed in ADT Open Site No. 5.



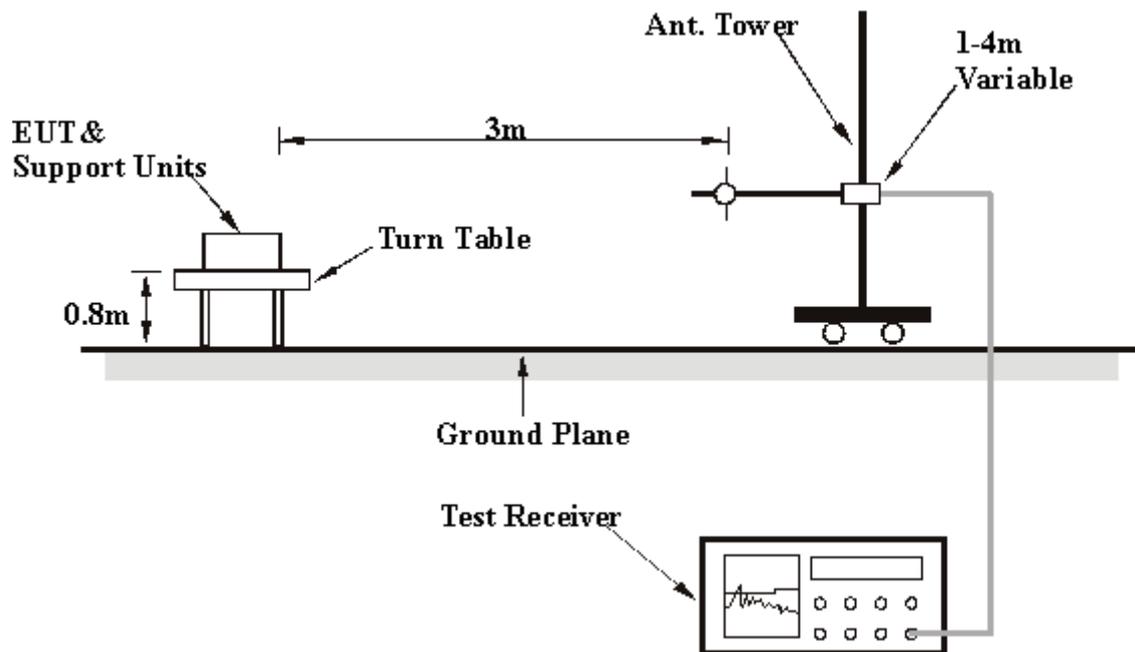
4.7.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.7.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.7.5 TEST RESULTS (A)

Digital Portion:

EUT	Wireless JoyStick	MODEL	J-UE16
MODE	Channel 78	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	64.00	20.3 QP	40.00	-19.70	1.48H	3	13.17	5.74	1.39	0.00	-7.13
2	120.00	12.3 QP	43.50	-31.20	1.39H	207	-1.56	11.65	2.21	0.00	-13.86
3	144.00	13.9 QP	43.50	-29.60	1.45H	167	0.72	10.58	2.60	0.00	-13.19
4	150.00	20.1 QP	43.50	-23.40	1.49H	156	7.13	10.30	2.66	0.00	-12.98
5	244.00	13.9 QP	46.00	-32.10	1.49H	92	-1.85	11.56	4.19	0.00	-15.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	64.00	14.0 QP	40.00	-26.00	1.28V	8	6.87	5.74	1.39	0.00	-7.13
2	120.00	17.5 QP	43.50	-26.00	1.16V	119	3.64	11.65	2.21	0.00	-13.86
3	144.00	20.0 QP	43.50	-23.50	1.29V	175	6.82	10.58	2.60	0.00	-13.18
4	220.00	13.3 QP	46.00	-32.70	1.28V	97	-0.66	10.12	3.85	0.00	-13.96
5	244.00	15.3 QP	46.00	-30.70	1.31V	296	-0.45	11.56	4.19	0.00	-15.75

NOTE:

- Emission level = Raw value - Correction Factor
- Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
- Margin value = Emission level - Limit value
The other emission levels were very low against the limit.

RF Portion :

EUT	Wireless JoyStick	MODEL	J-UE16
MODE	Channel 0	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	84.5 AV	-	-	1.15H	77	86.62	27.67	5.10	34.90	2.13
2	*2402.00	84.8 PK	-	-	1.15H	77	86.94	27.67	5.10	34.90	2.13
3	4804.00	40.8 AV	54.00	-13.20	1.58H	108	36.67	31.52	7.23	34.63	-4.12
4	4804.00	54.1 PK	74.00	-19.90	1.58H	108	50.00	31.52	7.23	34.63	-4.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	83.7 AV	-	-	1.15V	21	85.86	27.67	5.10	34.90	2.13
2	*2402.00	84.2 PK	-	-	1.15V	21	86.37	27.67	5.10	34.90	2.13
3	4804.00	36.9 AV	54.00	-17.10	1.00V	62	32.80	31.52	7.23	34.63	-4.12
4	4804.00	47.1 PK	74.00	-26.90	1.00V	62	42.96	31.52	7.23	34.63	-4.12

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. “ * “ : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless JoyStick	MODEL	J-JE16
MODE	Channel 39	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	84.5 AV	-	-	1.07H	48	86.50	27.81	5.08	34.90	2.01
2	*2441.00	85.2 PK	-	-	1.07H	48	87.20	27.81	5.08	34.90	2.01
3	4882.00	41.2 AV	54.00	-12.80	1.51H	87	37.00	31.59	7.21	34.63	-4.17
4	4882.00	54.4 PK	74.00	-19.60	1.51H	87	50.23	31.59	7.21	34.63	-4.17

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	83.4 AV	-	-	1.34V	74	85.37	27.81	5.08	34.90	2.01
2	*2441.00	84.1 PK	-	-	1.34V	74	86.10	27.81	5.08	34.90	2.01
3	4882.00	37.3 AV	54.00	-16.70	1.05V	15	33.10	31.59	7.21	34.63	-4.17
4	4882.00	47.4 PK	74.00	-26.60	1.05V	15	43.26	31.59	7.21	34.63	-4.18

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless JoyStick	MODEL	J-UE16
MODE	Channel 78	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	84.3 AV	-	-	1.17H	32	86.14	27.96	5.06	34.90	1.89
2	*2480.00	85.0 PK	-	-	1.17H	32	86.85	27.96	5.06	34.90	1.89
3	4960.00	40.6 AV	54.00	-13.40	1.55H	147	36.20	31.72	7.26	34.61	-4.38
4	4960.00	54.2 PK	74.00	-19.80	1.55H	146	49.80	31.72	7.26	34.61	-4.38

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	83.5 AV	-	-	1.14V	76	85.41	27.96	5.06	34.90	1.89
2	*2480.00	84.1 PK	-	-	1.14V	76	86.00	27.96	5.06	34.90	1.89
3	4960.00	36.8 AV	54.00	-17.20	1.01V	50	32.43	31.72	7.26	34.61	-4.38
4	4960.00	47.3 PK	74.00	-26.70	1.01V	50	42.90	31.72	7.26	34.61	-4.39

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

4.7.6 TEST RESULTS (B)

Digital Portion:

EUT	Wireless JoyStick	MODEL	C-UG10b
MODE	Channel 78	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	72.00	25.5 QP	40.00	-14.50	1.31H	46	17.56	6.45	1.50	0.00	-7.94
2	84.00	15.9 QP	40.00	-24.10	1.37H	113	6.55	7.63	1.71	0.00	-9.35
3	144.00	21.6 QP	43.50	-21.90	1.46H	179	8.42	10.58	2.60	0.00	-13.18
4	168.00	24.4 QP	43.50	-19.10	1.54H	124	11.98	9.35	3.07	0.00	-12.42
5	240.00	24.0 QP	46.00	-22.00	1.39H	296	8.43	11.41	4.16	0.00	-15.57
6	276.00	24.3 QP	46.00	-21.70	1.20H	240	7.03	12.59	4.68	0.00	-17.27
7	460.00	30.5 QP	46.00	-15.50	1.24H	334	6.86	16.53	7.11	0.00	-23.64

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	72.00	27.6 QP	40.00	-12.40	1.48V	133	19.65	6.45	1.50	0.00	-7.94
2	120.00	24.5 QP	43.50	-19.00	1.32V	179	10.64	11.65	2.21	0.00	-13.86
3	144.00	24.4 QP	43.50	-19.10	1.20V	174	11.22	10.58	2.60	0.00	-13.18
4	168.00	29.9 QP	43.50	-13.60	1.17V	110	17.43	9.35	3.07	0.00	-12.43
5	204.00	24.0 QP	43.50	-19.50	1.31V	145	11.11	9.25	3.64	0.00	-12.90
6	216.00	27.5 QP	43.50	-16.00	1.08V	108	13.72	9.97	3.81	0.00	-13.79
7	240.00	29.2 QP	46.00	-16.80	1.00V	86	13.63	11.41	4.16	0.00	-15.58
8	240.00	29.2 QP	46.00	-16.80	1.00V	110	13.63	11.41	4.16	0.00	-15.57
9	460.00	31.5 QP	46.00	-14.50	1.61V	44	7.86	16.53	7.11	0.00	-23.65

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

RF Portion :

EUT	Wireless JoyStick	MODEL	C-UG10b
MODE	Channel 0	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	89.1 AV	-	-	1.06H	101	91.20	27.67	5.10	34.90	2.13
2	*2402.00	91.8 PK	-	-	1.06H	101	93.97	27.67	5.10	34.90	2.13
3	4804.00	36.3 AV	54.00	-17.70	1.14H	61	32.18	31.52	7.23	34.63	-4.12
4	4804.00	46.5 PK	74.00	-27.50	1.14H	61	42.39	31.52	7.23	34.63	-4.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	86.2 AV	-	-	1.52V	80	88.35	27.67	5.10	34.90	2.13
2	*2402.00	89.0 PK	-	-	1.52V	80	91.10	27.67	5.10	34.90	2.13
3	4804.00	37.8 AV	54.00	-16.20	1.27V	101	33.70	31.52	7.23	34.63	-4.12
4	4804.00	48.1 PK	74.00	-25.90	1.27V	101	43.95	31.52	7.23	34.63	-4.12

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless JoyStick	MODEL	C-UG10b
MODE	Channel 39	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	88.8 AV	-	-	1.08H	68	90.80	27.81	5.08	34.90	2.01
2	*2441.00	91.0 PK	-	-	1.08H	68	93.00	27.81	5.08	34.90	2.01
3	4882.00	36.1 AV	54.00	-17.90	1.31H	141	31.89	31.59	7.21	34.63	-4.17
4	4882.00	46.3 PK	74.00	-27.70	1.31H	141	42.17	31.59	7.21	34.63	-4.18

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	86.0 AV	-	-	1.15V	108	88.03	27.81	5.08	34.90	2.01
2	*2441.00	88.7 PK	-	-	1.15V	108	90.67	27.81	5.08	34.90	2.01
3	4882.00	37.6 AV	54.00	-16.40	1.04V	209	33.43	31.59	7.21	34.63	-4.17
4	4882.00	47.9 PK	74.00	-26.10	1.04V	209	43.76	31.59	7.21	34.63	-4.18

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless JoyStick	MODEL	C-UG10b
MODE	Channel 78	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 60%RH, 1050 hPa	TESTED BY: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	89.2 AV	-	-	1.00H	16	91.10	27.96	5.06	34.90	1.89
2	*2480.00	91.5 PK	-	-	1.00H	16	93.34	27.96	5.06	34.90	1.89
3	4960.00	36.5 AV	54.00	-17.50	1.60H	87	32.12	31.72	7.26	34.61	-4.38
4	4960.00	46.6 PK	74.00	-27.40	1.60H	87	42.24	31.72	7.26	34.61	-4.39

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	86.2 AV	-	-	1.00V	129	88.10	27.96	5.06	34.90	1.89
2	*2480.00	89.0 PK	-	-	1.00V	129	90.86	27.96	5.06	34.90	1.89
3	4960.00	38.4 AV	54.00	-15.60	1.21V	58	34.00	31.72	7.26	34.61	-4.38
4	4960.00	48.6 PK	74.00	-25.40	1.21V	58	44.21	31.72	7.26	34.61	-4.39

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz RB).

4.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 24, 2003

Notes:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.



4.8.4 EUT OPERATING CONDITION

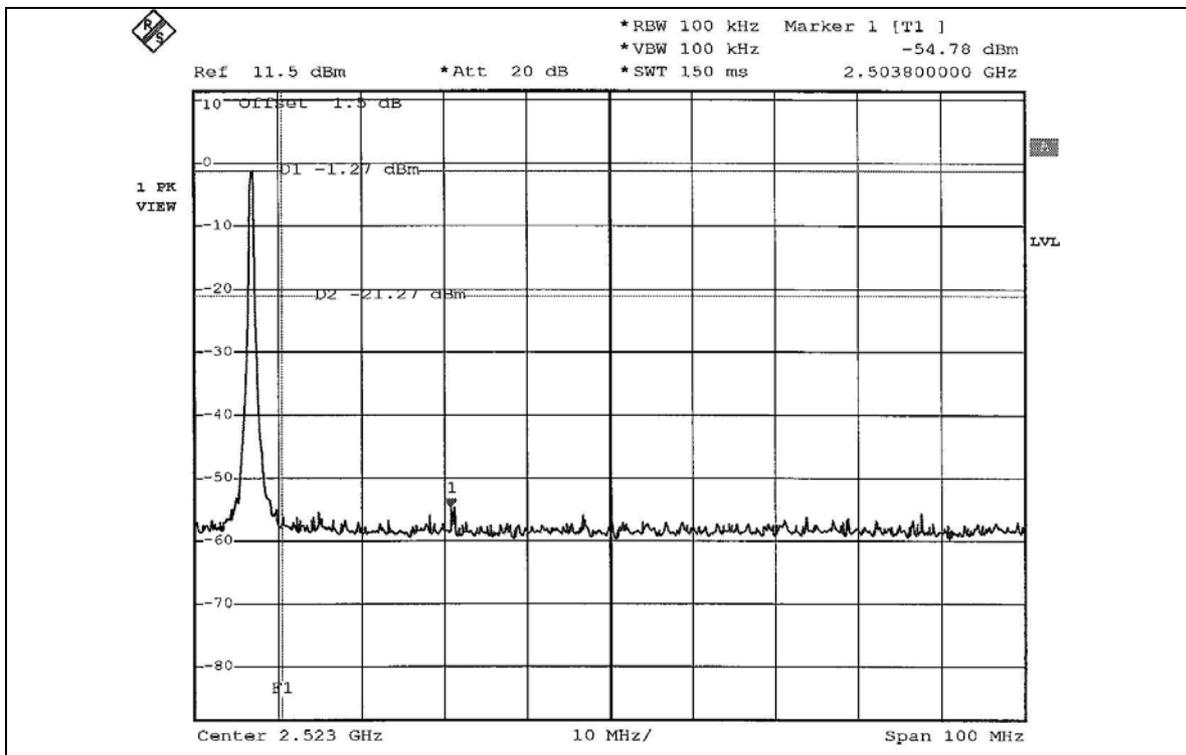
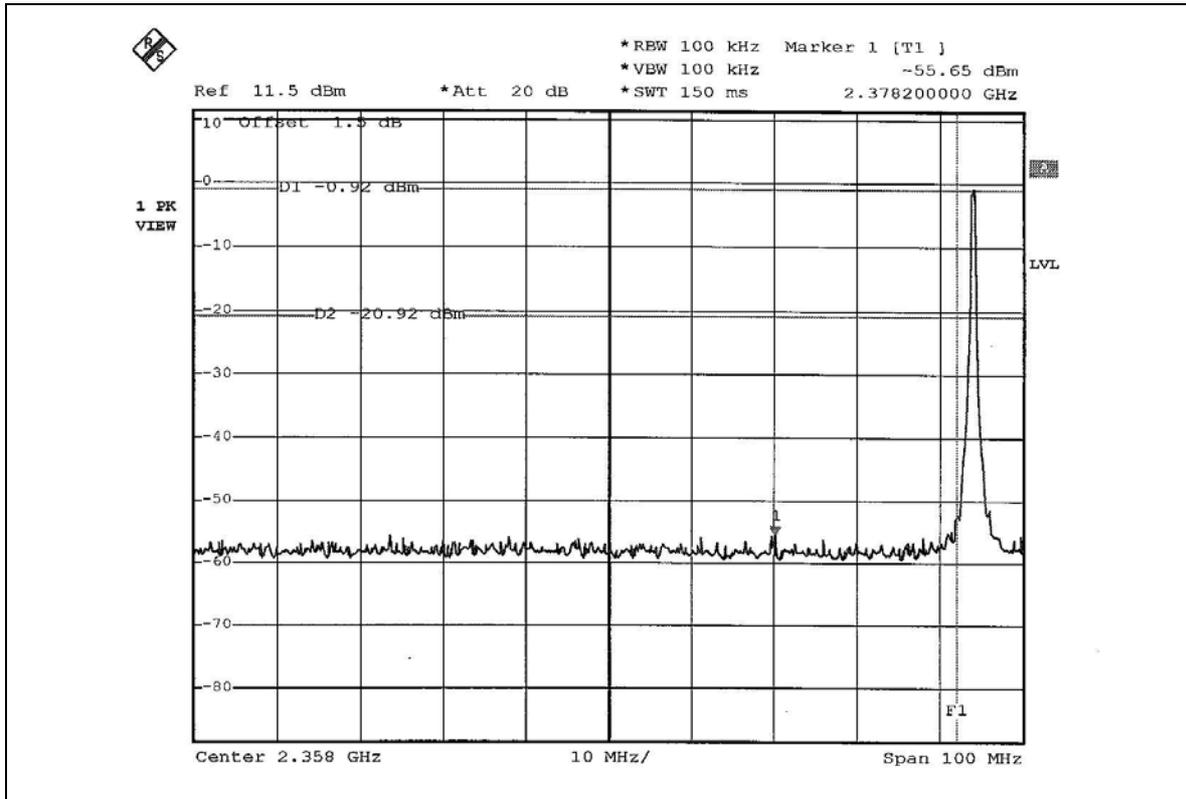
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.8.5 TEST RESULTS (A)

The spectrum plots are attached below. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE1: The band edge emission plot on the following page shows 54.73dB delta between carrier maximum power and local maximum emission in restrict band (2.3782GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.4 is 84.5dBuV/m, so the maximum field strength in restrict band is $84.5 - 54.73 = 29.77$ dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following page shows 53.51dB delta between carrier maximum power and local maximum emission in restrict band (2.5038GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.4 is 84.3dBuV/m, so the maximum field strength in restrict band is $84.3 - 53.51 = 30.79$ dBuV/m which is under 54 dBuV/m limit.



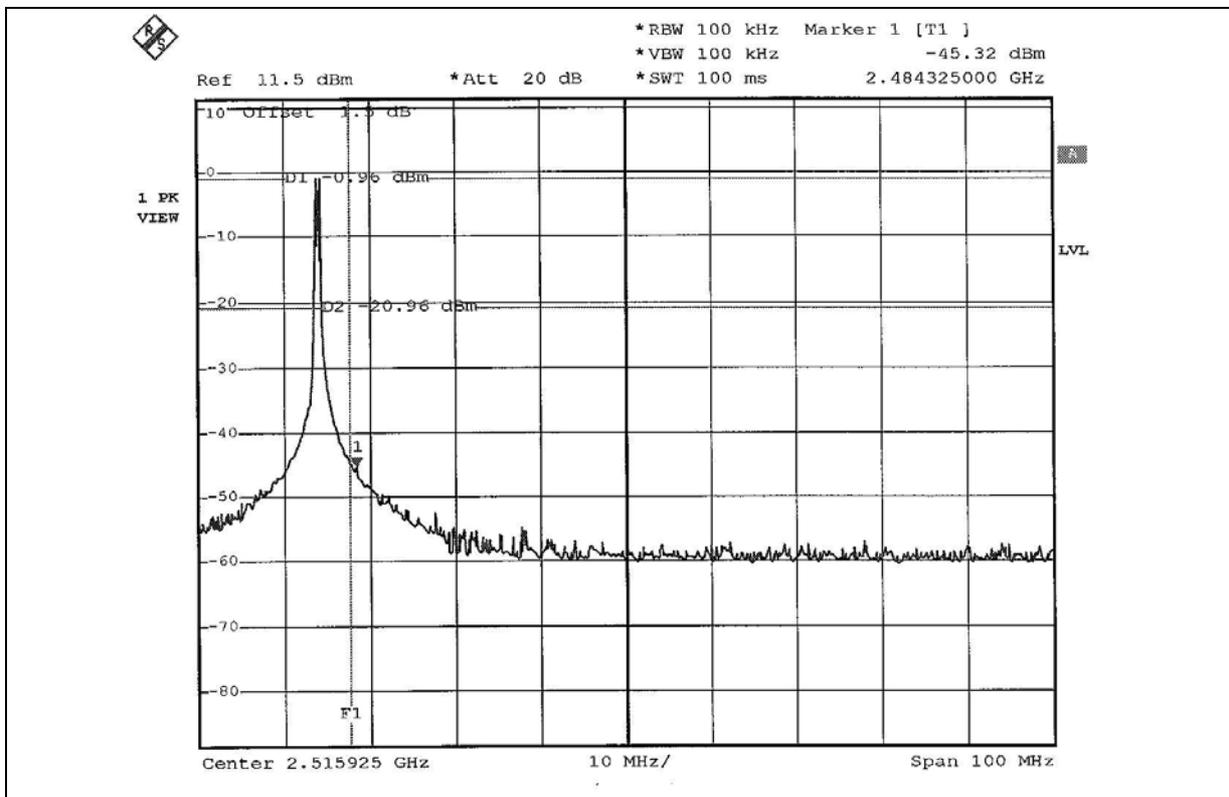
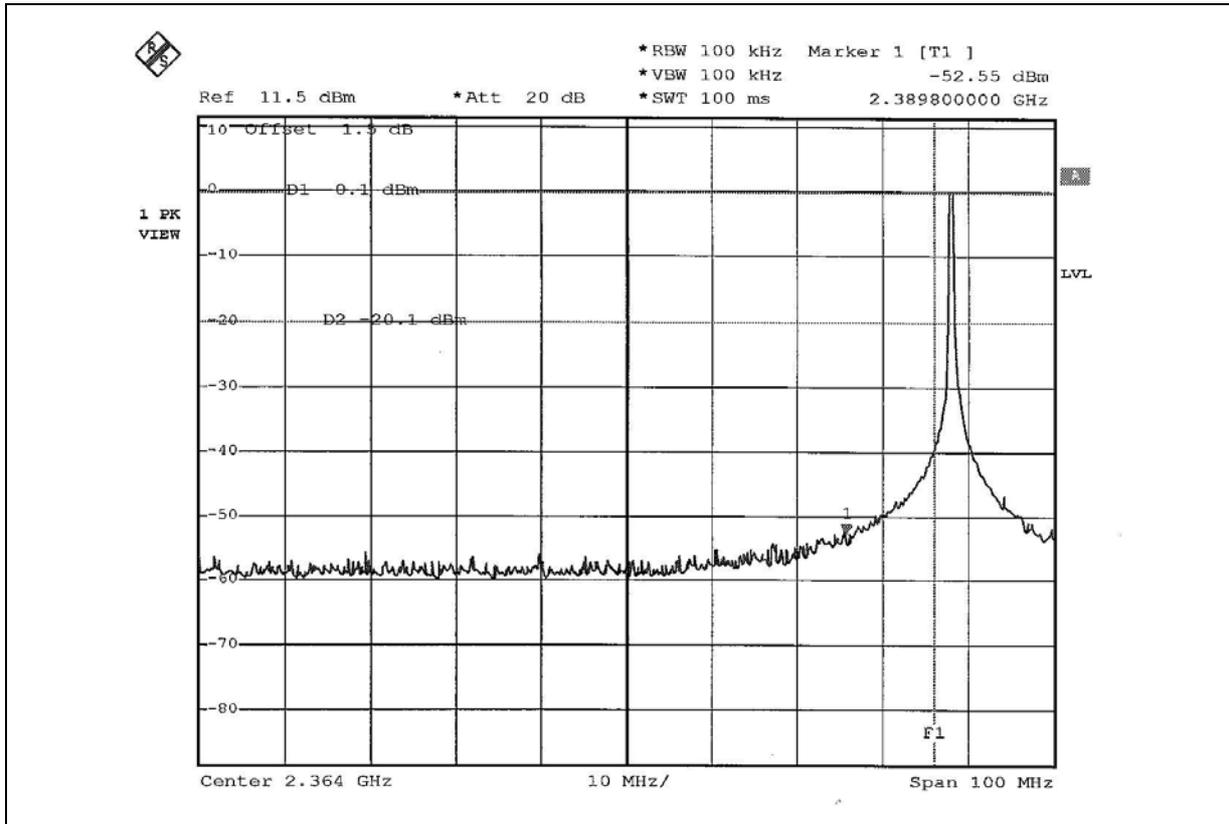


4.8.6 TEST RESULTS (B)

The spectrum plots are attached below. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE1: The band edge emission plot on the following page shows 52.45dB delta between carrier maximum power and local maximum emission in restrict band (2.3898GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.5 is 89.1dBuV/m, so the maximum field strength in restrict band is $89.1 - 52.45 = 36.65$ dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following page shows 44.36dB delta between carrier maximum power and local maximum emission in restrict band (2.4843GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.5 is 89.2dBuV/m, so the maximum field strength in restrict band is $89.2 - 44.36 = 44.84$ dBuV/m which is under 54 dBuV/m limit.





4.9 ANTENNA REQUIREMENT

4.9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

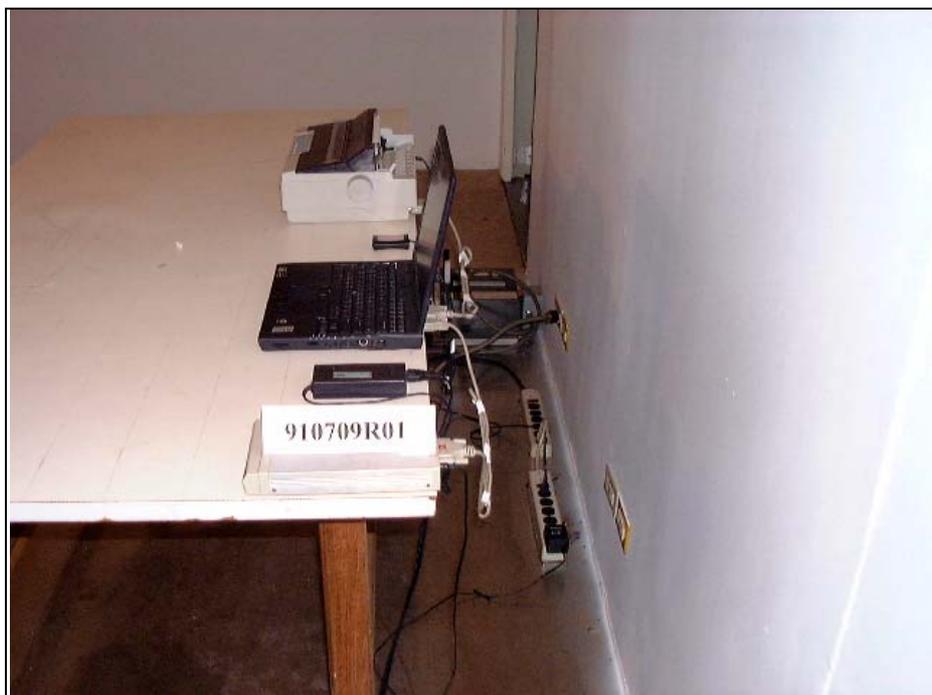
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Inverted-F antenna. There is no antenna connector. The maximum Gain of this antenna is only -1dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST







6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.