FCC TEST REPORT

REPORT NO.: RF930921A11
MODEL NO.: SK-8812
RECEIVED: Sep. 22, 2004
TESTED: Sep. 23 ~ Oct. 28, 2004
ISSUED: Nov. 4, 2004

APPLICANT: Lite-On Technology Corporation

ADDRESS: 90,Chien I Road, Chung Ho,
Taipei Hsien, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

ACCREDITED
No. 2177-01

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ILAC MRA

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ADT CORP.

1 CERTIFICATION

PRODUCT :	Wireless USB Keyboard
BRAND NAME :	IBM
MODEL NO. :	SK-8812
APPLICANT :	Lite-On Technology Corporation
TESTED :	Sep. 23 ~ Oct. 28, 2004
TEST SAMPLE :	ENGINEERING SAMPLE
STANDARDS :	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Annie Chang , **DATE:** Nov. 4, 2004
(Annie Chang)

TECHNICAL ACCEPTANCE : Arthur Lin , **DATE:** Nov. 4, 2004
Responsible for EMI
(Arthur Lin)

APPROVED BY : , **DATE:** Nov. 4, 2004
(Cody Chang, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	N/A	N/A
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit : min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is –11.70dB at 4804.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Uncertainty
Radiated emissions	3.86 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless USB Keyboard
MODEL NO.	SK-8812
POWER SUPPLY	4.5Vdc from battery
MODULATION TYPE	GFSK
TRANSFER RATE	62.5kbits / sec.
FREQUENCY RANGE	2402MHz ~ 2479MHz
NUMBER OF CHANNEL	78
MAXIMUM OUTPUT POWER	1.718mW
ANTENNA TYPE	Wiggle antenna with –1.41dBi gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is a transmitter part of a wireless Keyboard.

2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Seventy-eight channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2431	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460		
19	2421	39	2441	59	2461		

NOTE:

1. Below 1GHz, the channel 0, 39, and 77 were pre-tested in chamber. The channel 77, the worst case, was chosen for final test.
2. Above 1GHz, the channel 0, 39, and 77 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless USB Keyboard. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

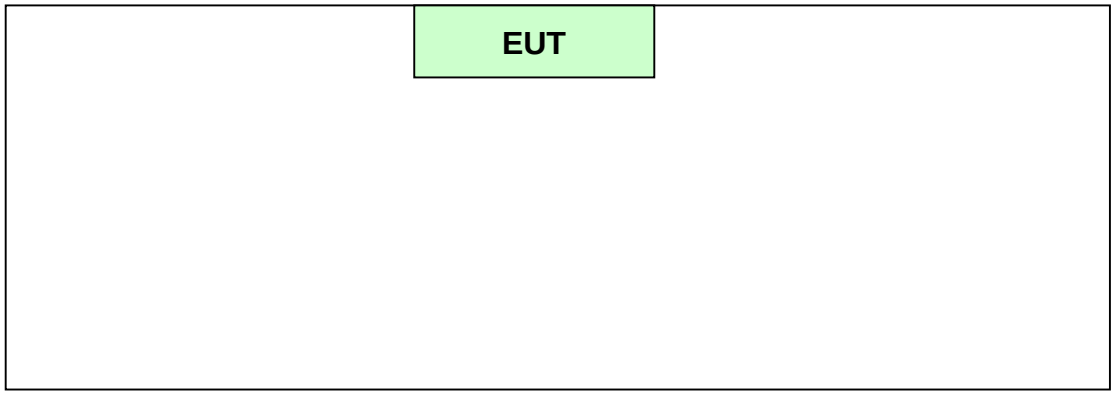
FCC Part 15, Subpart C. (15.247)
ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT was tested stand alone.

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

N/A

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Preamplifier	8447D	2432A03504	Jun. 3, 2005
***** HP Preamplifier	8449B	3008A01924	Sep. 19, 2005
***** HP Preamplifier	8449B	3008A01638	Sep. 30, 2005
SCHWARZBECK Tunable Dipole Antenna SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	NA 977	Nov. 15, 2004
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Feb. 12, 2005
Schwarzbeck Antenna	VULB9168	137	Feb. 27, 2005
***** EMCO Horn Antenna	3115	6714	Nov. 26, 2004
***** EMCO Horn Antenna	3115	9312-4192	Feb. 28, 2005
ADT. Turn Table	TT100	0306	NA
ADT. Tower	AT100	0306	NA
Software	ADT_Radiated_V6	NA	NA
TIMES RF cable	LL142	CABLE-CH6-01	Apr. 16, 2005

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. "*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Chamber No. 6.
5. The Industry Canada Reference No. IC 3789-6.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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.

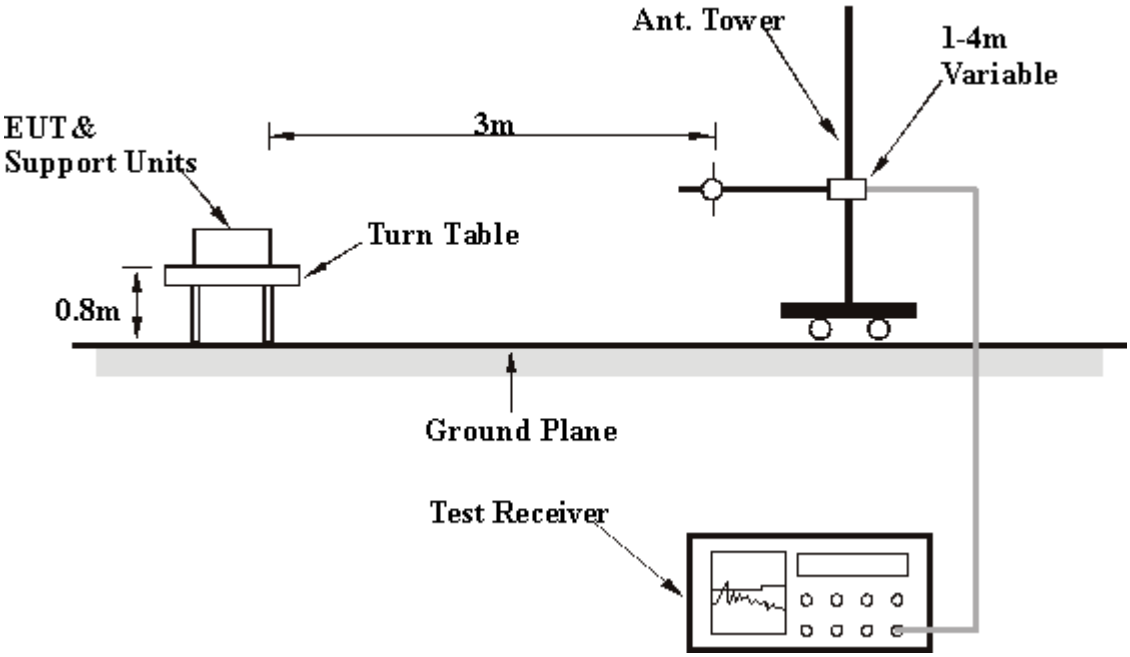
NOTE:

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.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

4.2.7 TEST RESULTS

EUT	Wireless USB Keyboard	**MODEL**	SK-8812
CHANNEL	77	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER	4.5Vdc from battery	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27 deg. C, 79% RH, 991 hPa	**TESTED BY**	Jamison Chan

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)	Correction Factor (dB/m)
1	710.36	24.34 QP	46.00	-21.66	2.00 H	268	0.82	23.53
2	774.51	25.04 QP	46.00	-20.96	4.00 H	82	0.23	24.81
3	823.11	25.44 QP	46.00	-20.56	1.00 H	148	0.25	25.20
4	865.87	25.90 QP	46.00	-20.10	2.00 H	181	0.27	25.63
5	908.64	25.41 QP	46.00	-20.59	3.00 H	55	-0.48	25.89
6	953.35	26.26 QP	46.00	-19.74	2.00 H	145	-0.40	26.66

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

EUT	Wireless USB Keyboard	**MODEL**	SK-8812
CHANNEL	77	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER	4.5Vdc from battery	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27 deg. C, 79% RH, 991 hPa	**TESTED BY**	Jamison Chan

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)	Correction Factor (dB/m)
1	41.66	20.72 QP	40.00	-19.28	1.00 V	298	7.29	13.42
2	755.07	25.24 QP	46.00	-20.76	1.00 V	274	0.46	24.78
3	788.12	25.24 QP	46.00	-20.76	1.00 V	76	0.41	24.84
4	856.15	26.25 QP	46.00	-19.75	2.00 V	337	0.65	25.61
5	912.53	26.01 QP	46.00	-19.99	3.00 V	202	0.05	25.97
6	957.23	25.97 QP	46.00	-20.03	2.00 V	217	-0.69	26.65

REMARKS: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

EUT	Wireless USB Keyboard	**MODEL**	SK-8812
CHANNEL	0	**FREQUENCY RANGE**	1~20 GHz
INPUT POWER	4.5Vdc from battery	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 79% RH, 991 hPa	**TESTED BY**	Jamison Chan

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)	Correction Factor (dB/m)
1	2390.00	29.29 PK	74.00	-44.71	1.00 H	218	-3.52	32.81
1	2390.00	28.19 AV	54.00	-25.81	1.00 H	218	-4.62	32.81
2	*2402.00	91.60 PK			1.00 H	218	58.71	32.89
2	*2402.00	90.50 AV			1.00 H	218	57.61	32.89
3	4804.00	54.16 PK	74.00	-19.84	1.00 H	60	15.30	38.86
3	4804.00	41.54 AV	54.00	-12.46	1.00 H	60	2.68	38.86

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)	Correction Factor (dB/m)
1	2390.00	28.27 PK	74.00	-45.73	1.00 V	264	-4.54	32.81
1	2390.00	27.02 AV	54.00	-26.98	1.00 V	264	-5.79	32.81
2	*2402.00	90.58 PK			1.00 V	264	57.69	32.89
2	*2402.00	89.33 AV			1.00 V	264	56.44	32.89
3	4804.00	54.95 PK	74.00	-19.05	1.00 V	266	16.09	38.86
3	**4804.00**	**42.30 AV**	**54.00**	**-11.70**	**1.00 V**	**266**	**3.44**	**38.86**

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	Wireless USB Keyboard	**MODEL**	SK-8812
CHANNEL	39	**FREQUENCY RANGE**	1~20 GHz
INPUT POWER	4.5Vdc from battery	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 79% RH, 991 hPa	**TESTED BY**	Jamison Chan

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)	Correction Factor (dB/m)
1	*2441.00	91.91 PK			1.00 H	217	58.82	33.09
1	*2441.00	90.53 AV			1.00 H	217	57.44	33.09
2	4882.00	54.49 PK	74.00	-19.51	1.00 H	224	15.60	38.89
2	4882.00	42.24 AV	54.00	-11.76	1.00 H	224	3.35	38.89

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)	Correction Factor (dB/m)
1	*2441.00	90.65 PK			1.00 V	265	57.56	33.09
1	*2441.00	89.36 AV			1.00 V	265	56.27	33.09
2	4882.00	54.12 PK	74.00	-19.88	1.00 V	211	15.23	38.89
2	4882.00	41.29 AV	54.00	-12.71	1.00 V	211	2.40	38.89

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

EUT	Wireless USB Keyboard	MODEL	SK-8812
CHANNEL	77	FREQUENCY RANGE	1~20 GHz
INPUT POWER	4.5Vdc from battery	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 79% RH, 991 hPa	TESTED BY	Jamison Chan

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)	Correction Factor (dB/m)
1	*2479.00	87.57 PK			1.00 H	39	54.28	33.29
1	*2479.00	85.80 AV			1.00 H	39	52.51	33.29
2	2483.50	39.00 PK	74.00	-35.00	1.00 H	39	5.69	33.31
2	2483.50	37.23 AV	54.00	-16.77	1.00 H	39	3.92	33.31
3	4958.00	53.81 PK	74.00	-20.19	1.00 H	51	14.79	39.02
3	4958.00	41.75 AV	54.00	-12.25	1.00 H	51	2.73	39.02

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)	Correction Factor (dB/m)
1	*2479.00	90.70 PK			1.01 V	267	57.41	33.29
1	*2479.00	89.35 AV			1.01 V	267	56.06	33.29
2	2483.50	42.13 PK	74.00	-31.87	1.01 V	267	8.82	33.31
2	2483.50	40.78 AV	54.00	-13.22	1.01 V	267	7.47	33.31
3	4958.00	53.81 PK	74.00	-20.19	1.01 V	265	14.79	39.02
3	4958.00	42.25 AV	54.00	-11.75	1.01 V	265	3.23	39.02

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * " : Fundamental frequency.

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSP 40	100036	Mar 18. 2005

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

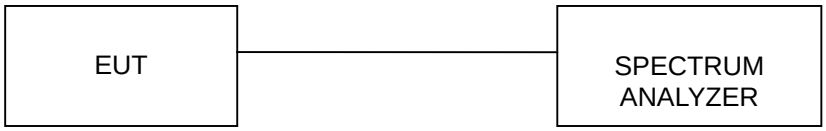
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



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

4.3.6 EUT OPERATING CONDITIONS

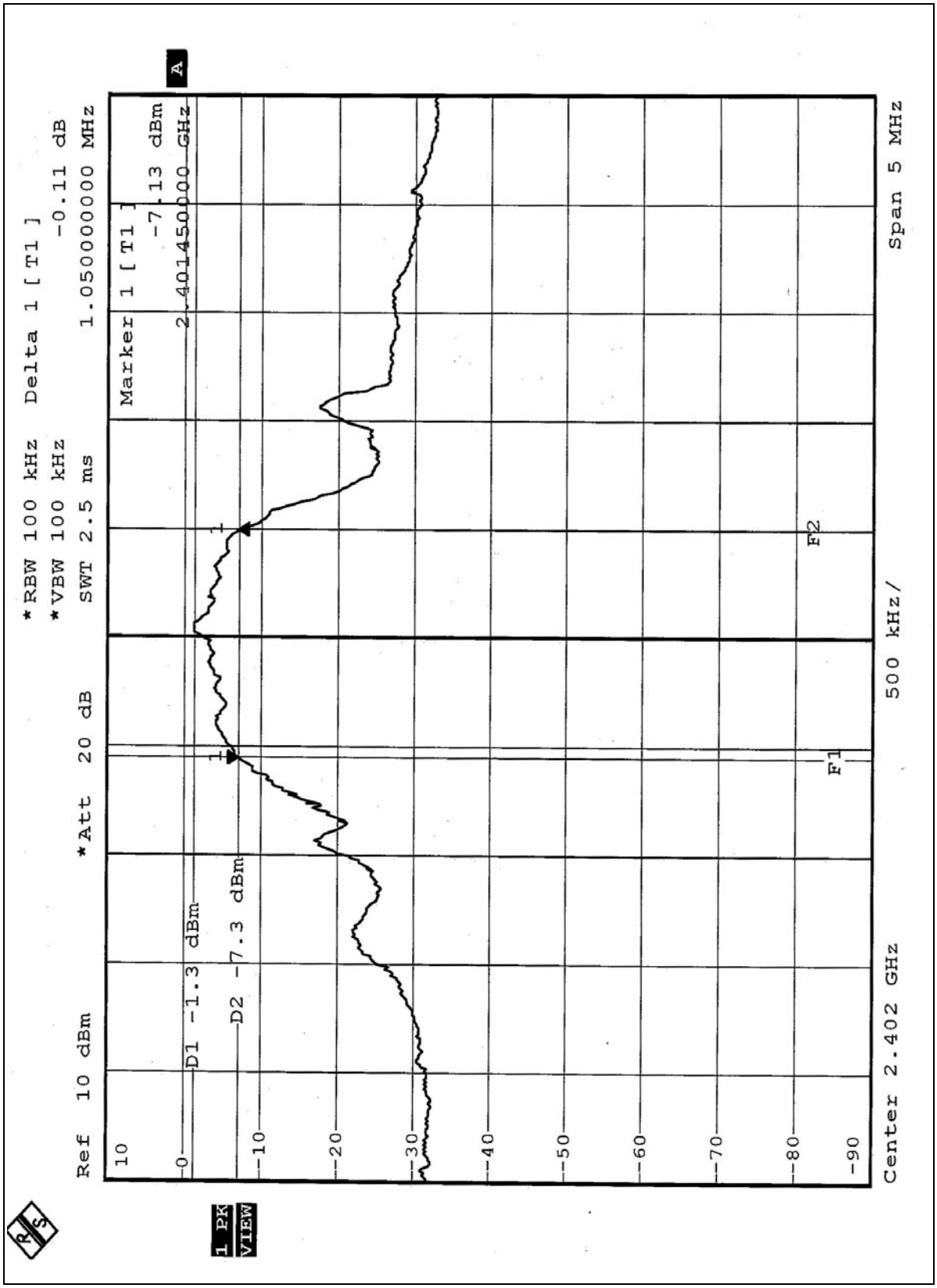
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

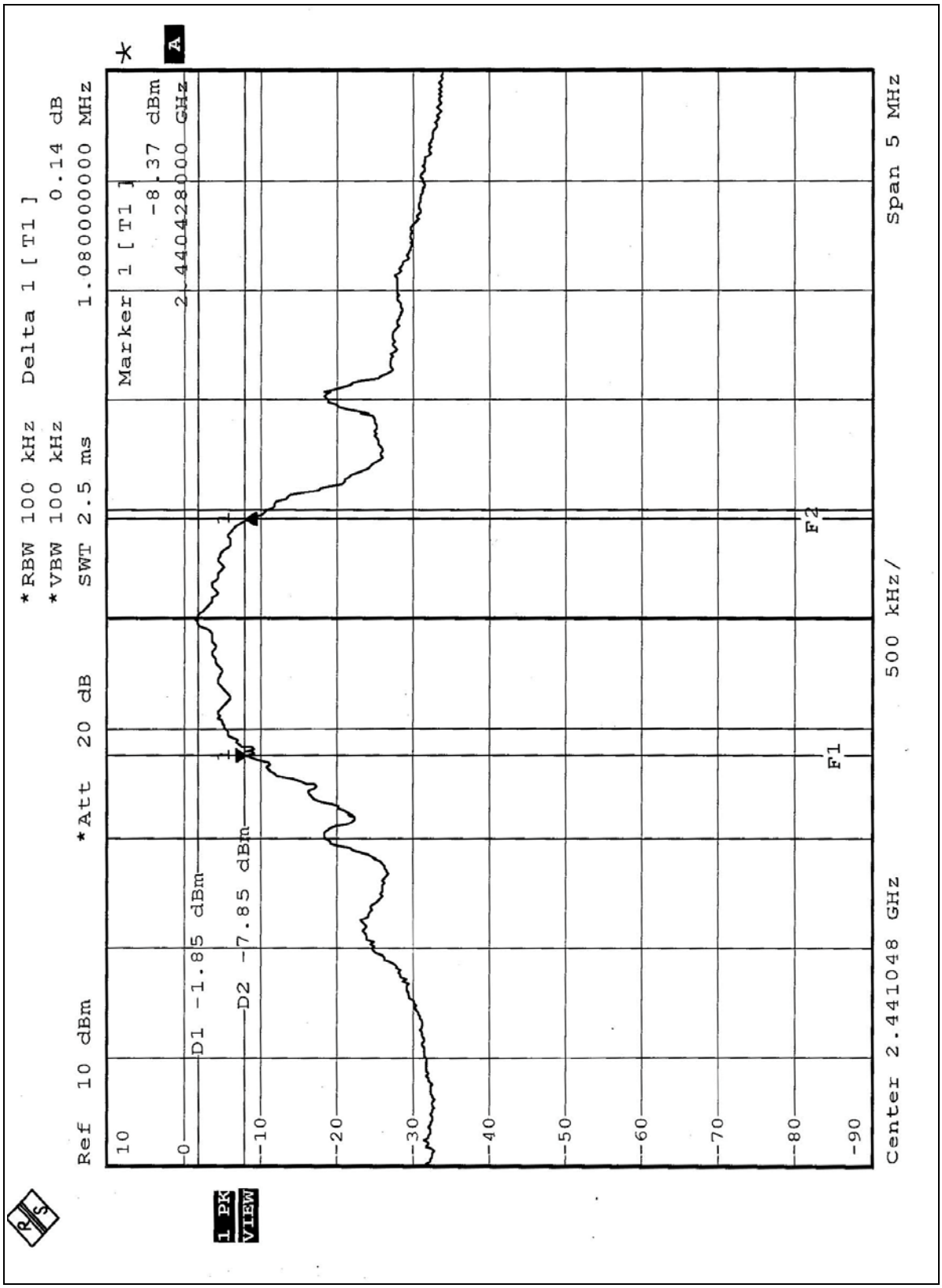
EUT	Wireless USB Keyboard	**MODEL**	SK-8812
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25 deg. C, 72% RH, 991 hPa
TESTED BY	Jamison Chan		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
0	2402	1.05	0.5	PASS
39	2441	1.08	0.5	PASS
77	2479	1.06	0.5	PASS

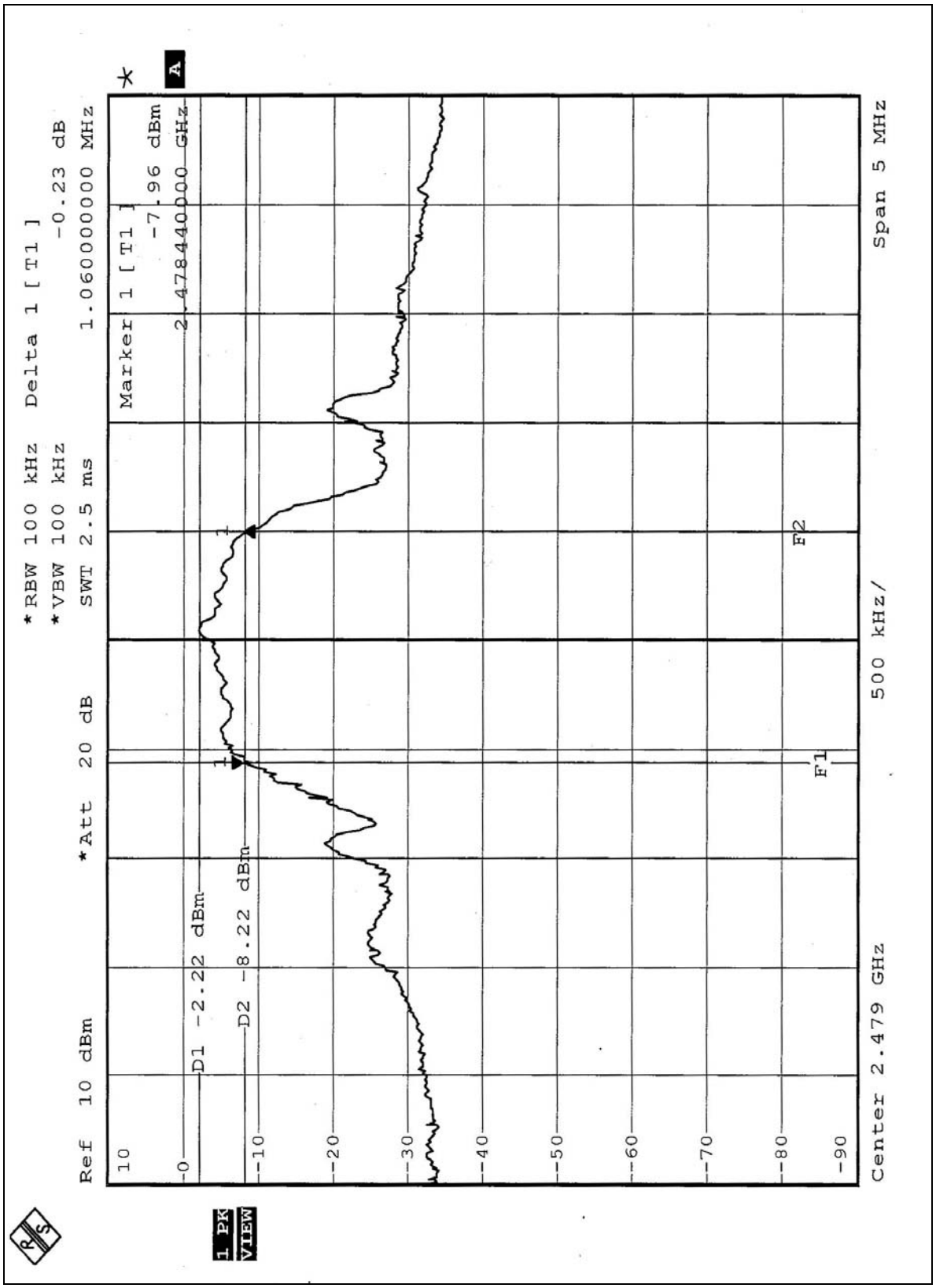
CH0


Ref 10 dBm
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 1 [T1]
-0.11 dB
1.050000000 MHz
Marker 1 [T1]
-7.13 dBm
2.401450000 GHz
D1 -1.3 dBm
D2 -7.3 dBm
Center 2.402 GHz
500 kHz/
Span 5 MHz
F1
F2
1 PK VIEW

CH39


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 1 [T1]
0.14 dB
1.080000000 MHz
Marker 1 [T1]
-8.37 dBm
2.440428000 GHz
*Att 20 dB
Ref 10 dBm
D1 -1.85 dBm
D2 -7.85 dBm
Center 2.441048 GHz
500 kHz/
Span 5 MHz
F1
F2
1 PK VIEW

CH77


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 1 [T1]
-0.23 dB
1.06000000 MHz
Marker 1 [T1]
-7.96 dBm
2.47844000 GHz
Ref 10 dBm
*Att 20 dB
D1 -2.22 dBm
D2 -8.22 dBm
F1
F2
Center 2.479 GHz
500 kHz/
Span 5 MHz
1 PK
VIEW

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Mar 18. 2005
ROHDE & SCHWARZ Signal Generator	SMR40	100231	Mar. 17. 2005
Tektronix Oscilloscope	TDS1012	C019167	Feb. 01. 2005
Narda Detector	4503A	FSCM99899	NA

NOTE: 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. A detector was used on the output port of the EUT. An oscilloscope was used to peak the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same peak reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

EUT	Wireless USB Keyboard	MODEL	SK-8812
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 72% RH, 991 hPa
TESTED BY	Jamison Chan		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	1.718	2.35	30	PASS
39	2441	1.560	1.93	30	PASS
77	2479	1.396	1.45	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSP 40	100036	Mar 18. 2005

NOTE: 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

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP

4.5.6 EUT OPERATING CONDITIONS

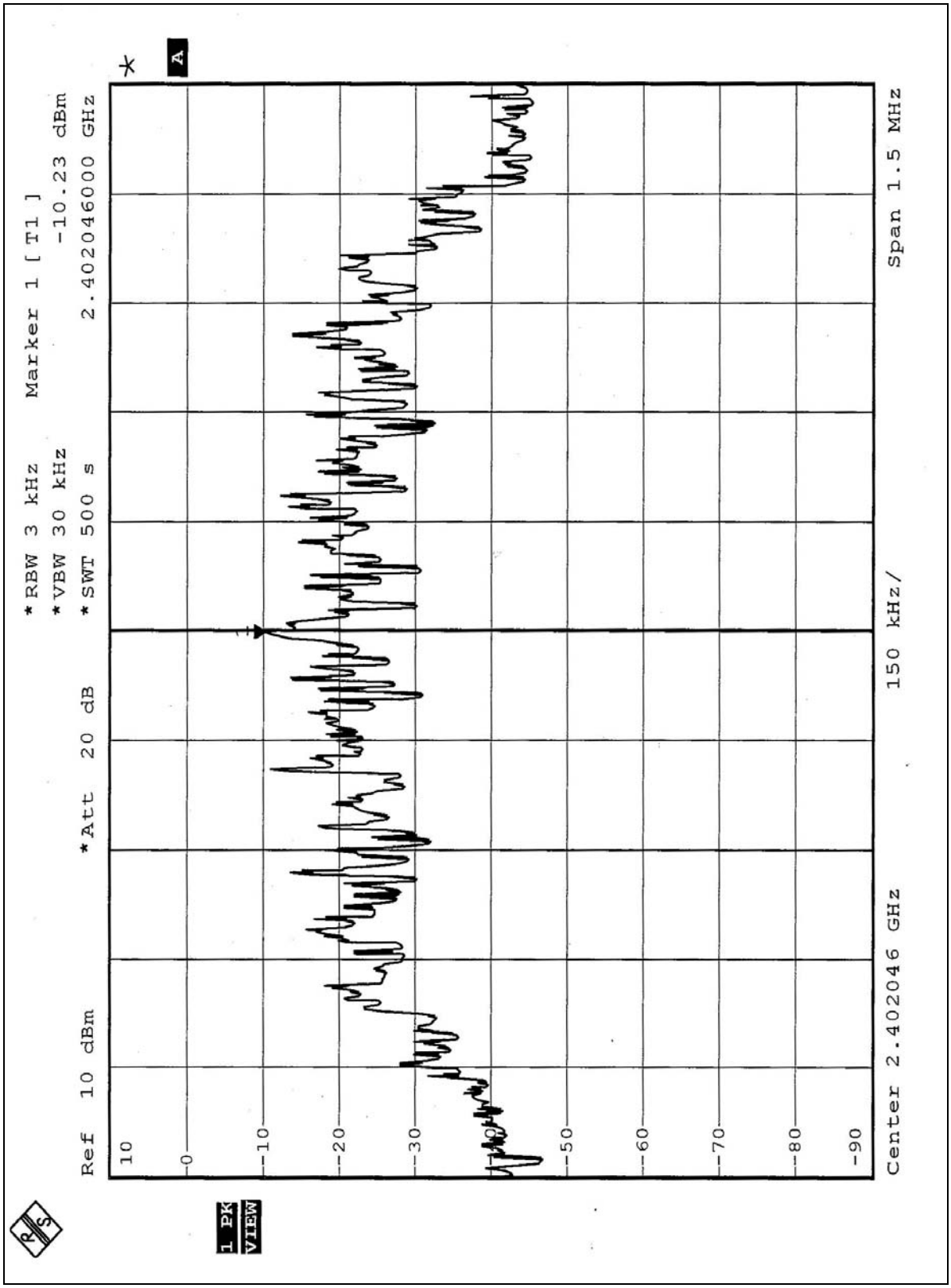
Same as 4.3.6

4.5.7 TEST RESULTS

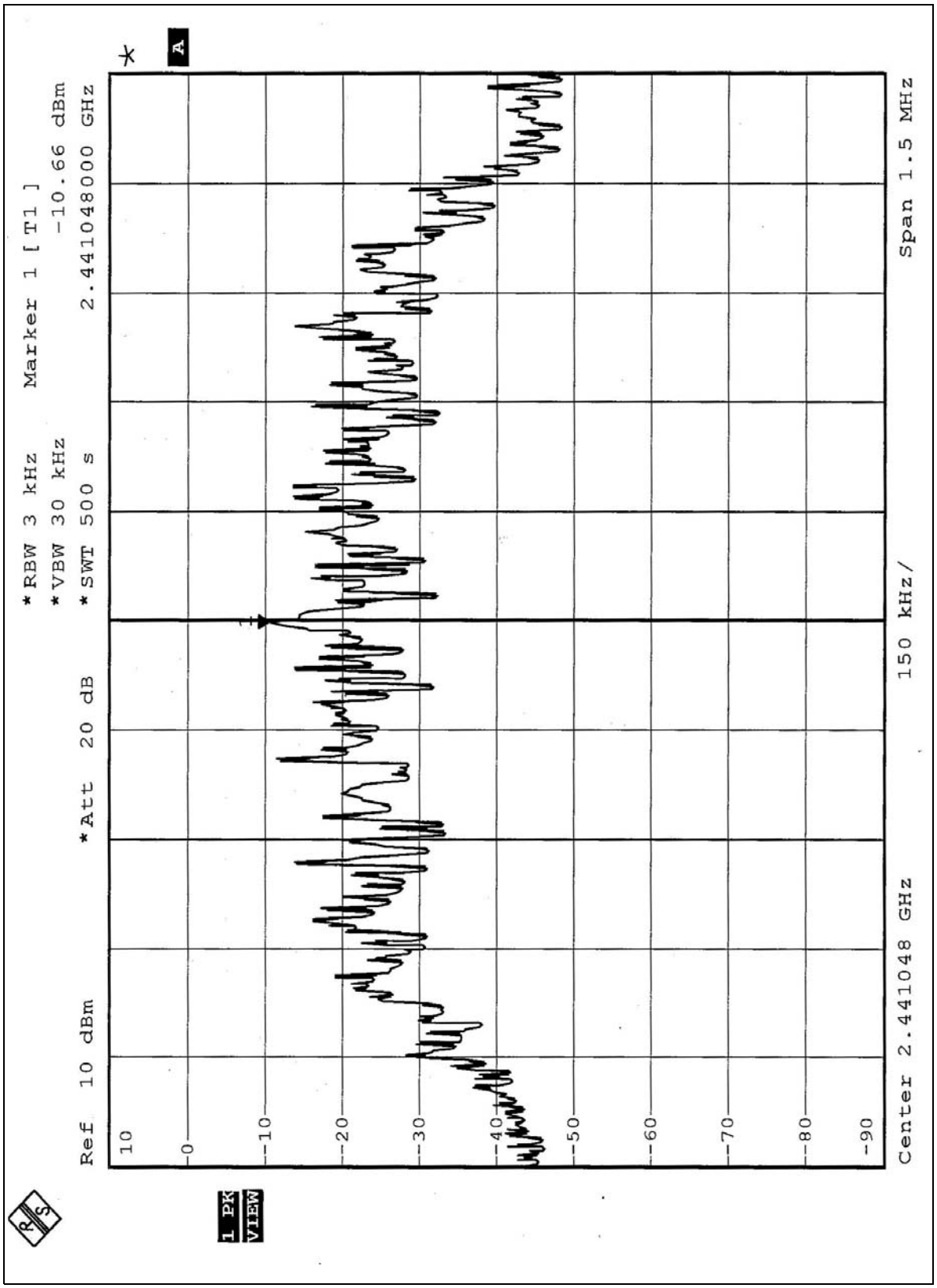
EUT	Wireless USB Keyboard	MODEL	SK-8812
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 72% RH, 991 hPa
TESTED BY	Jamison Chan		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
0	2402	-10.23	8	PASS
39	2441	-10.66	8	PASS
77	2479	-10.69	8	PASS

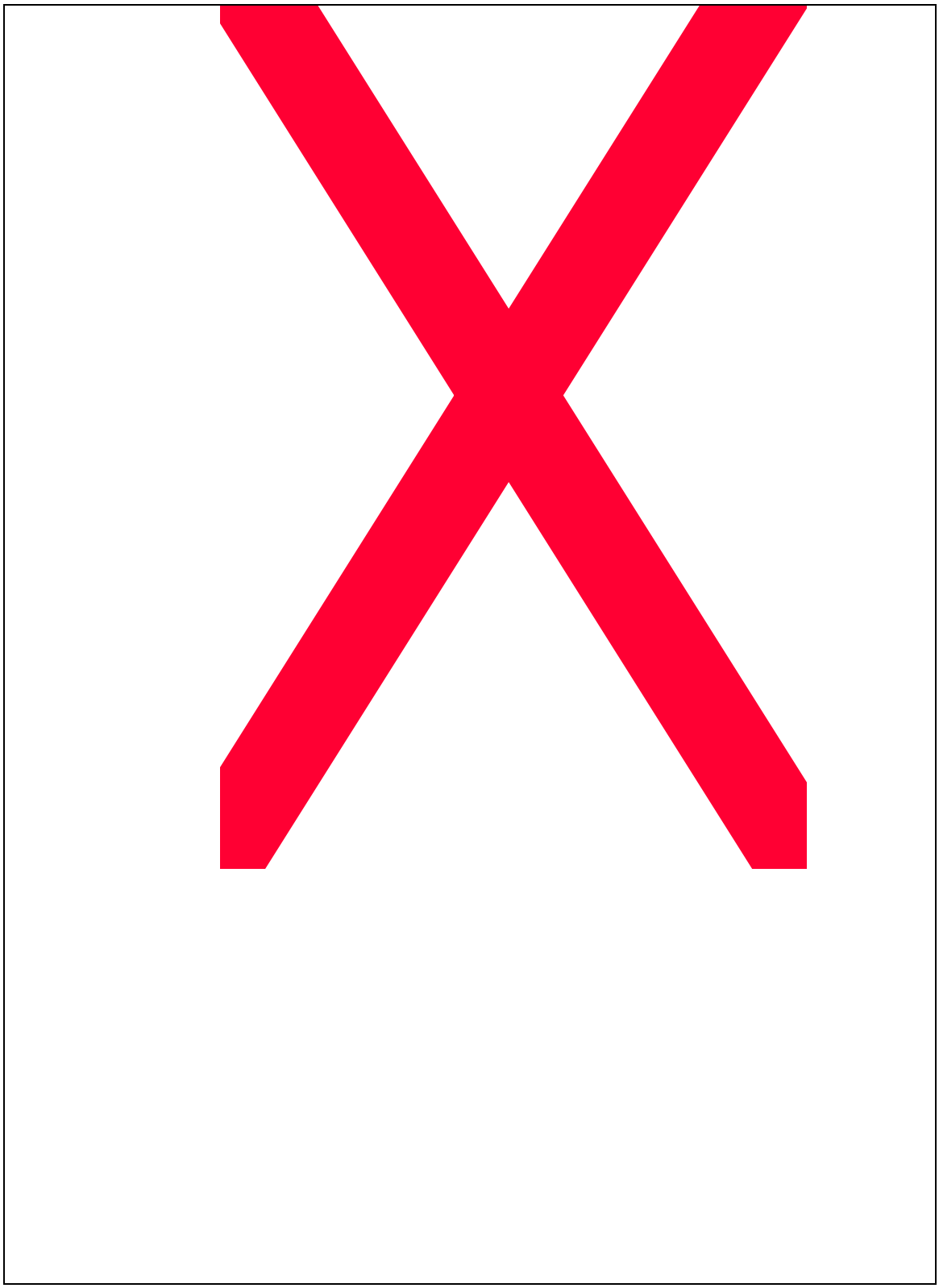
CH0


Ref 10 dBm
*Att 20 dB
*VBW 30 kHz
*RBW 3 kHz
*SWT 500 s
Marker 1 [T1]
-10.23 dBm
2.40204600 GHz
Center 2.402046 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW
A

CH39


A
Marker 1 [T1]
-10.66 dBm
2.441048000 GHz
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
*Att 20 dB
Ref 10 dBm
Span 1.5 MHz
150 kHz/
Center 2.441048 GHz
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW

CH77



4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE: 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 PROCEDURE

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 TEST RESULTS

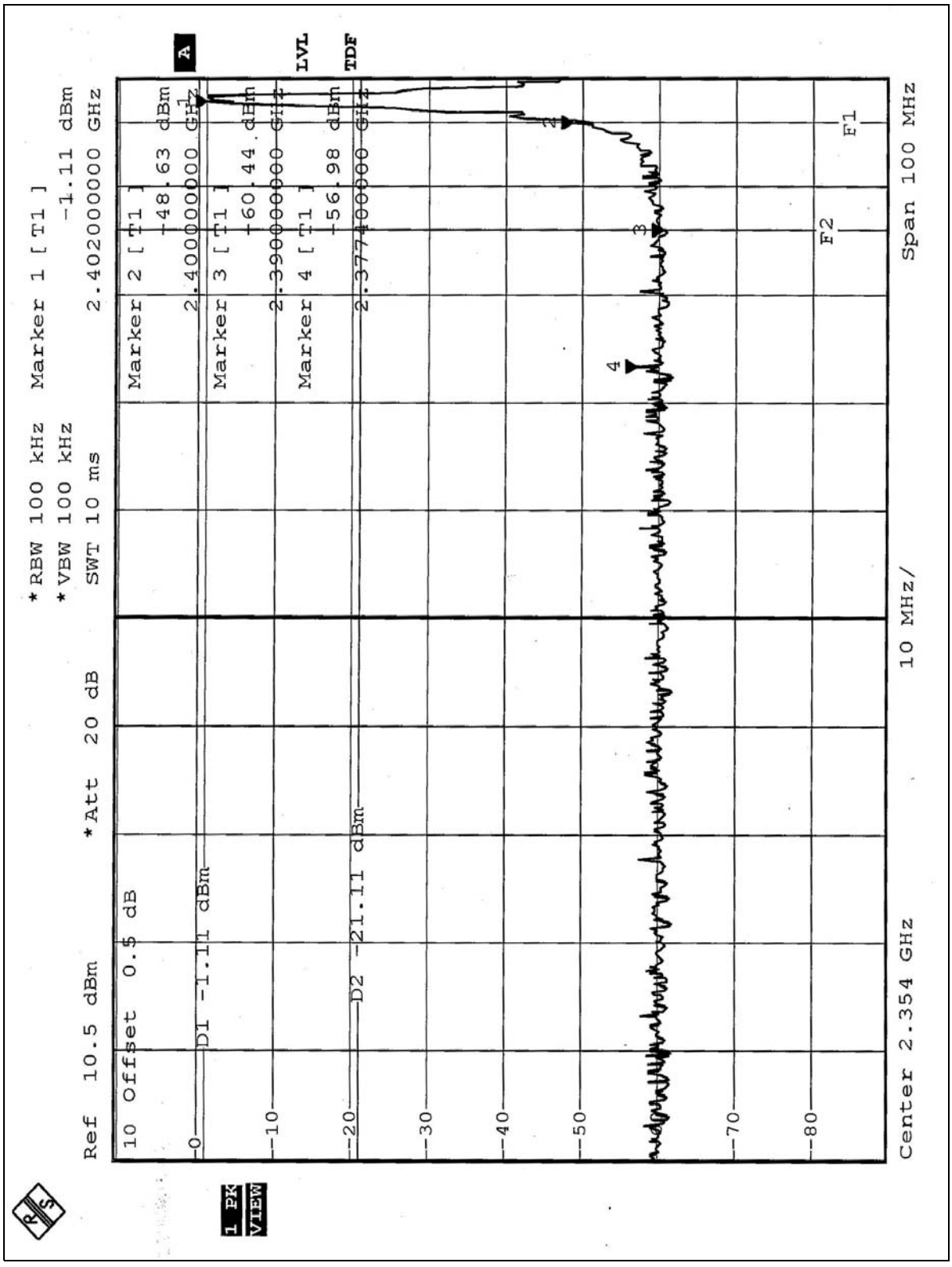
The spectrum plots are attached on the following 4pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

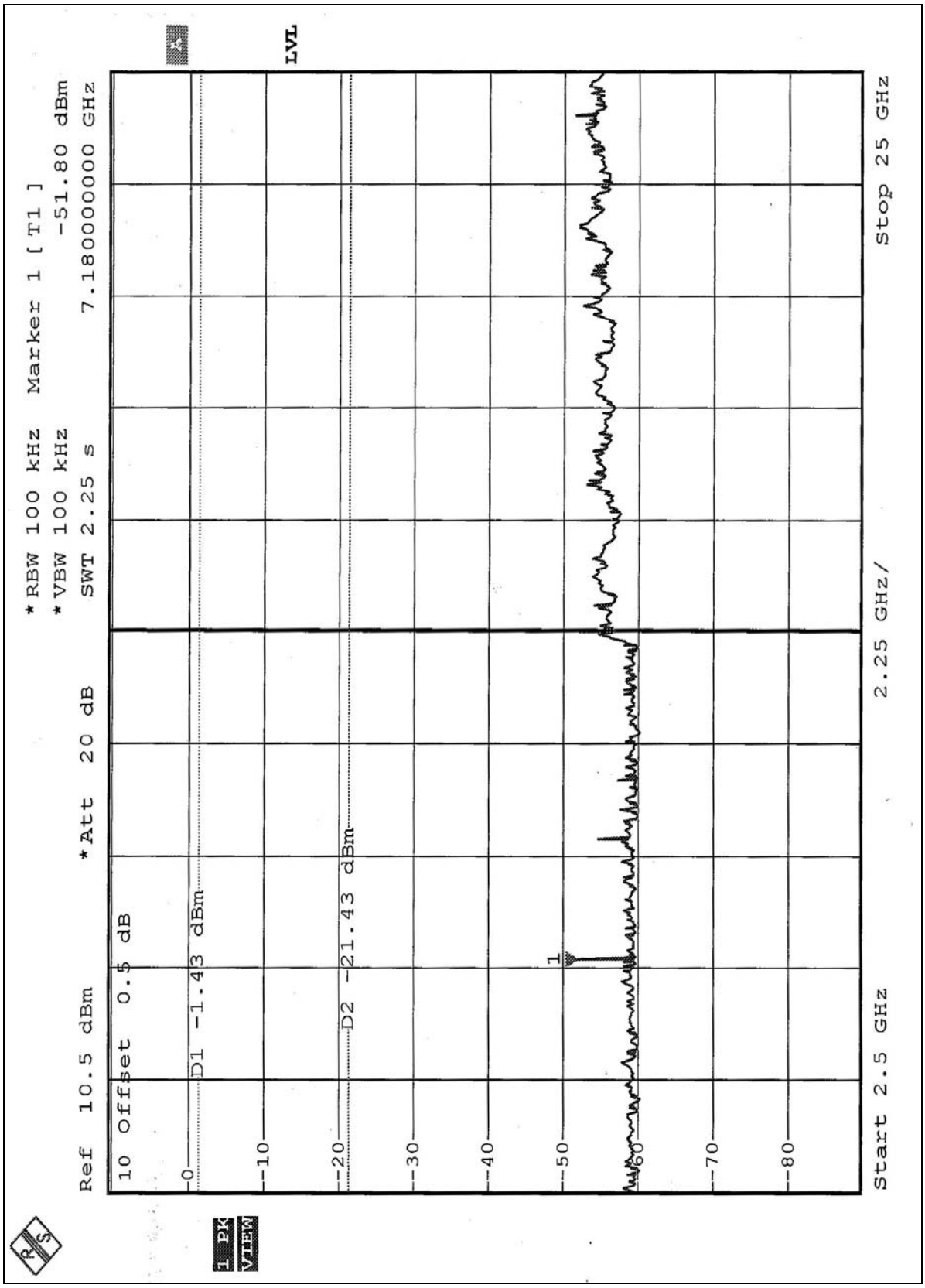
4.6.7 TEST RESULTS

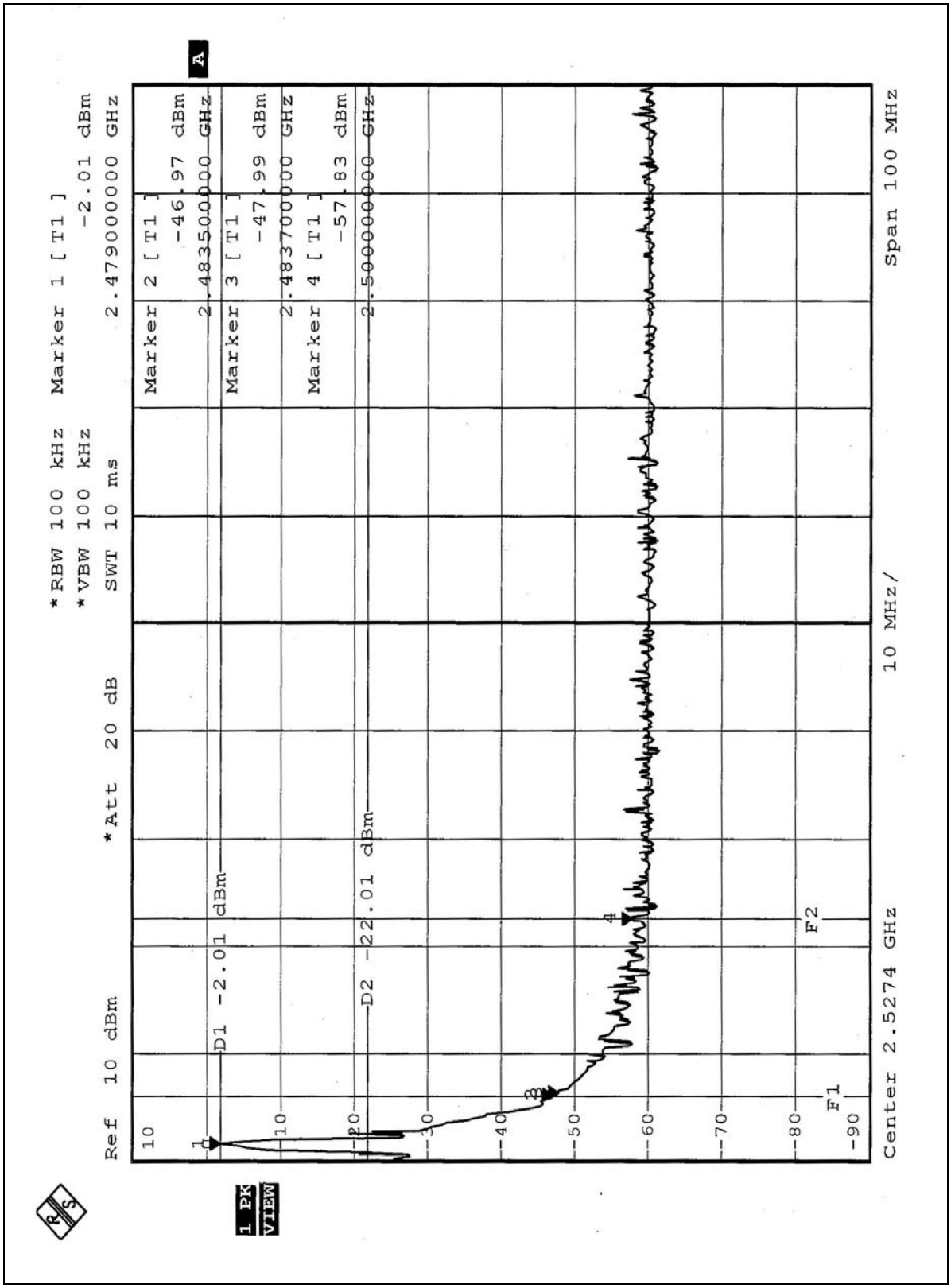
NOTE:

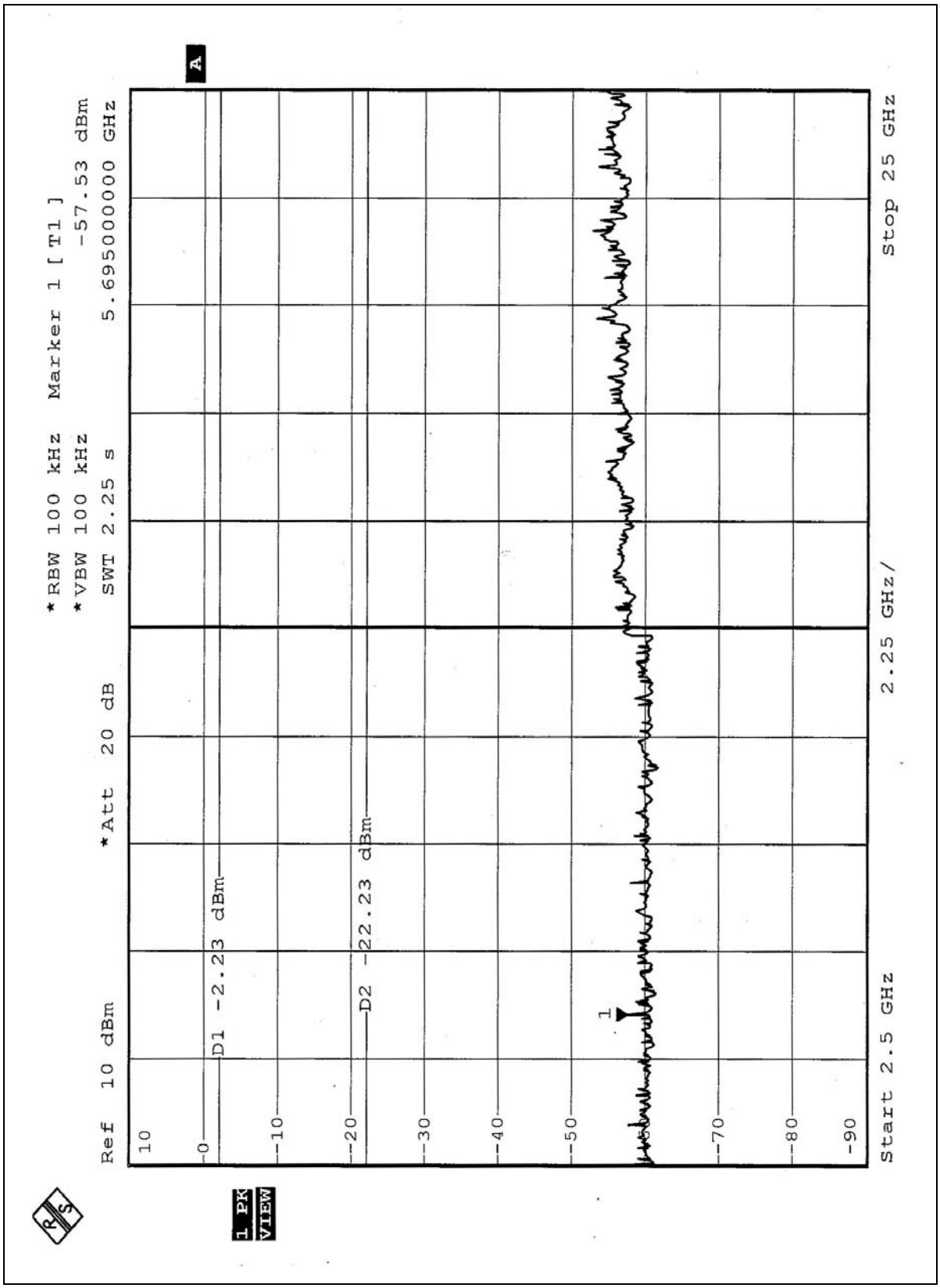
The band edge emission plot on the following 1~2 pages show 55.87dB delta between carrier maximum power and local maximum emission in restrict band (2.3774GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.8 is 90.50dBuV/m, so the maximum field strength in restrict band is 90.50-55.87=34.63dBuV/m which is under 54dBuV/m limit.

The band edge emission plot of on the following 3~4 pages show 45.98dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 77 at the item 4.2.8 is 89.35dBuV/m, so the maximum field strength in restrict band is 89.35-44.96=44.39dBuV/m which is under 54dBuV/m limit.


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-1.11 dBm
2.402000000 GHz
Ref 10.5 dBm
Offset 0.5 dB
Att 20 dB
Marker 2 [T1]
48.63 dBm
2.400000000 GHz
Marker 3 [T1]
60.44 dBm
2.390000000 GHz
Marker 4 [T1]
56.98 dBm
2.377400000 GHz
D1 -1.11 dBm
D2 -21.11 dBm
LVL
TDF
F1
F2
1 PK VIEW
Center 2.354 GHz
10 MHz/
Span 100 MHz


Ref 10.5 dBm
10 offset 0.5 dB
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-51.80 dBm
7.180000000 GHz
D1 -1.43 dBm
D2 -21.43 dBm
1 PK VIEW
LVL
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


Ref 10 dBm
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-2.01 dBm
2.47900000 GHz
Marker 2 [T1]
-46.97 dBm
2.48350000 GHz
Marker 3 [T1]
-47.99 dBm
2.48370000 GHz
Marker 4 [T1]
-57.83 dBm
2.50000000 GHz
D1 -2.01 dBm
D2 -22.01 dBm
F1
F2
1 PK VIEW
Center 2.5274 GHz
10 MHz/
Span 100 MHz


Ref 10 dBm
*Att 20 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-57.53 dBm
5.695000000 GHz
D1 -2.23 dBm
D2 -22.23 dBm
1 PK VIEW
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 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 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Wiggle antenna. And the maximum Gain of this antenna is –1.41dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

RADIATED EMISSION TEST

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom 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, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

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:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

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