FCC TEST REPORT

REPORT NO.: RF951012L04

MODEL NO.: CZO-510

RECEIVED: Oct. 12, 2006

TESTED: Oct. 16 ~ Oct. 18, 2006

ISSUED: Oct. 23, 2006

APPLICANT: J-TEK INCORPORATION

ADDRESS: 2F-1, No. 83, Sec. 2, Gongdaowu Rd., Hsinchu City 30070, Taiwan

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. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This test report consists of 45 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, A2LA or any government agencies. The test results in the report only apply to the tested sample.

NO. 2177-01

0528

TABLE OF CONTENTS

1. CERTIFICATION…….. 4
2. SUMMARY OF TEST RESULTS…….. 5
2.1 MEASUREMENT UNCERTAINTY 6
3. GENERAL INFORMATION…….…….. 7
3.1 GENERAL DESCRIPTION OF EUT 7
3.2 DESCRIPTION OF TEST MODES 8
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST 8
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL 9
3.2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS 10
3.2.4 DESCRIPTION OF SUPPORT UNITS 10
4. TEST TYPES AND RESULTS…… 11
4.1 CONDUCTED EMISSION MEASUREMENT 11
4.2 RADIATED EMISSION MEASUREMENT 11
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 11
4.2.2 TEST INSTRUMENTS 12
4.2.3 TEST PROCEDURES 13
4.2.4 DEVIATION FROM TEST STANDARD 13
4.2.5 TEST SETUP 14
4.2.6 EUT OPERATING CONDITIONS 14
4.2.7 TEST RESULTS 15
4.3 NUMBER OF HOPPING FREQUENCY USED 19
4.3.1 LIMIT OF HOPPING FREQUENCY USED 19
4.3.2 TEST INSTRUMENTS 19
4.3.3 TEST PROCEDURES 19
4.3.4 DEVIATION FROM TEST STANDARD 20
4.3.5 TEST SETUP 20
4.3.6 TEST RESULTS 20
4.4 DWELL TIME ON EACH CHANNEL 22
4.4.1 LIMIT OF DWELL TIME USED 22
4.4.2 TEST INSTRUMENTS 22
4.4.3 TEST PROCEDURES 22
4.4.4 DEVIATION FROM TEST STANDARD 22
4.4.5 TEST SETUP 23
4.4.6 TEST RESULTS 23
4.5 CHANNEL BANDWIDTH 27
4.5.1 LIMITS OF CHANNEL BANDWIDTH 27
4.5.2 TEST INSTRUMENTS 27
4.5.3 TEST PROCEDURE 27
4.5.4 DEVIATION FROM TEST STANDARD 28
4.5.5 TEST SETUP 28

4.5.6 EUT OPERATING CONDITION 28
4.5.7 TEST RESULTS 28
4.6 HOPPING CHANNEL SEPARATION 31
4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION 31
4.6.2 TEST INSTRUMENTS 31
4.6.3 TEST PROCEDURES 31
4.6.4 DEVIATION FROM TEST STANDARD 32
4.6.5 TEST SETUP 32
4.6.6 TEST RESULTS 32
4.7 MAXIMUM PEAK OUTPUT POWER 35
4.7.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 35
4.7.2 TEST INSTRUMENTS 35
4.7.3 TEST PROCEDURES 35
4.7.4 DEVIATION FROM TEST STANDARD 35
4.7.5 TEST SETUP 36
4.7.6 EUT OPERATING CONDITION 36
4.7.7 TEST RESULTS 36
4.8 BAND EDGES MEASUREMENT 39
4.8.1 LIMITS OF BAND EDGES MEASUREMENT 39
4.8.2 TEST INSTRUMENTS 39
4.8.3 TEST PROCEDURE 39
4.8.4 DEVIATION FROM TEST STANDARD 39
4.8.5 EUT OPERATING CONDITION 39
4.8.6 TEST RESULTS 40
4.9 ANTENNA REQUIREMENT 43
4.9.1 STANDARD APPLICABLE 43
4.9.2 ANTENNA CONNECTED CONSTRUCTION 43
5. INFORMATION ON THE TESTING LABORATORIES 44
APPENDIX-A A-1

1. CERTIFICATION

PRODUCT:	Bluetooth Headset
MODEL NO.:	CZO-510
BRAND NAME:	JTI
APPLICANT:	J-TEK INCORPORATION
TESTED:	Oct. 16 ~ Oct. 18, 2006
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (Model: CZO-510) have 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	: Jessie Wang	, **DATE:**	Oct. 23, 2006
TECHNICAL ACCEPTANCE Responsible for RF	: Long Chen	, **DATE:**	Oct. 23, 2006
APPROVED BY	: Gary Chang / Supervisor	, **DATE:**	Oct. 23, 2006

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	NA	NA
15.247(a)(1)(iii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit.
15.247(a)(1)(iii)	Dwell Time on Each Channel Spec. : Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit.
15.247(a)(1)	1. Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, whichever is greater (see Note 1) 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm (see Note 1)	PASS	Meet the requirement of limit.
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is –0.64dB at 2560.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.

NOTE: If The Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.

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	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.61 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth Headset
MODEL NO.	CZO-510
FCC ID	UQS-CZO-510
POWER SUPPLY	3.7Vdc from Li-Ion battery 5.0Vdc from AC Adapter
MODULATION TYPE	GFSK
RADIO TECHNOLOGY	FHSS
TRANSFER RATE	723kbps
FREQUENCY RANGE	2402 ~ 2480 MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	1.091mW
ANTENNA TYPE	PIFA antenna with 0dBi gain
DATA CABLE	NA
I/O PORTS	Refer to User's manual

NOTE:

1. Bluetooth technology is used for the EUT.
2. This EUT has no transmission function during the charger mode.
3. The EUT was powered by the following adapter and battery:

Adapter:

Brand:	JTI
Model:	MDA-05-250UB
Input:	100-240Vac, 50-60Hz, 80mA
Output:	5Vdc, 250mA
Power Line:	DC 1.1 m non-shielded cable without core

Battery:

Rating:	3.7Vdc

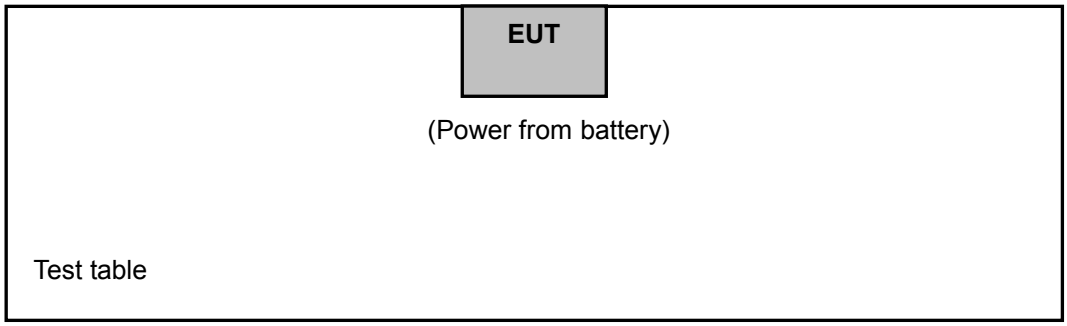
4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

79 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	78	2480
19	2421	39	2441	59	2461		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	Note	√	√	√	EUT only (transmission mode) (powered by battery)

Where **RE<1G:** Radiated Emission below 1GHz **RE≥1G:** Radiated Emission above 1GHz

APCM: Antenna Port Conducted MeasuremenT

Note: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, packet types and XYZ Axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	AXIS
0 to 78	78	FHSS	GFSK	DH5	Z

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, packet types and XYZ Axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	AXIS
0 to 78	0, 39, 78	FHSS	GFSK	DH5	Z

BANDEDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 78	FHSS	GFSK	DH5

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
0 to 78	0, 39, 78	FHSS	GFSK	DH5

3.2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. 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.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.2.4 DESCRIPTION OF SUPPORT UNITS

NA

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

NA

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
Test Receiver ROHDE & SCHWARZ	ESMI	839013/007 839379/002	Jan. 24, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSEK30	100049	Aug. 21, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Jan. 15, 2007
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 22, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01911	Sep. 13, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218188/218189	Dec. 13, 2006
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Mar. 08, 2007
Software ADT.	ADT_Radiated_ V7.6.01	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA
Antenna Tower Controller EMCO	2090	NA	NA
Turn Table EMCO	2087-2.03	NA	NA
Turn Table Controller EMCO	2090	NA	NA

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. The test was performed in HwaYa Chamber 9.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC4924A-9.

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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

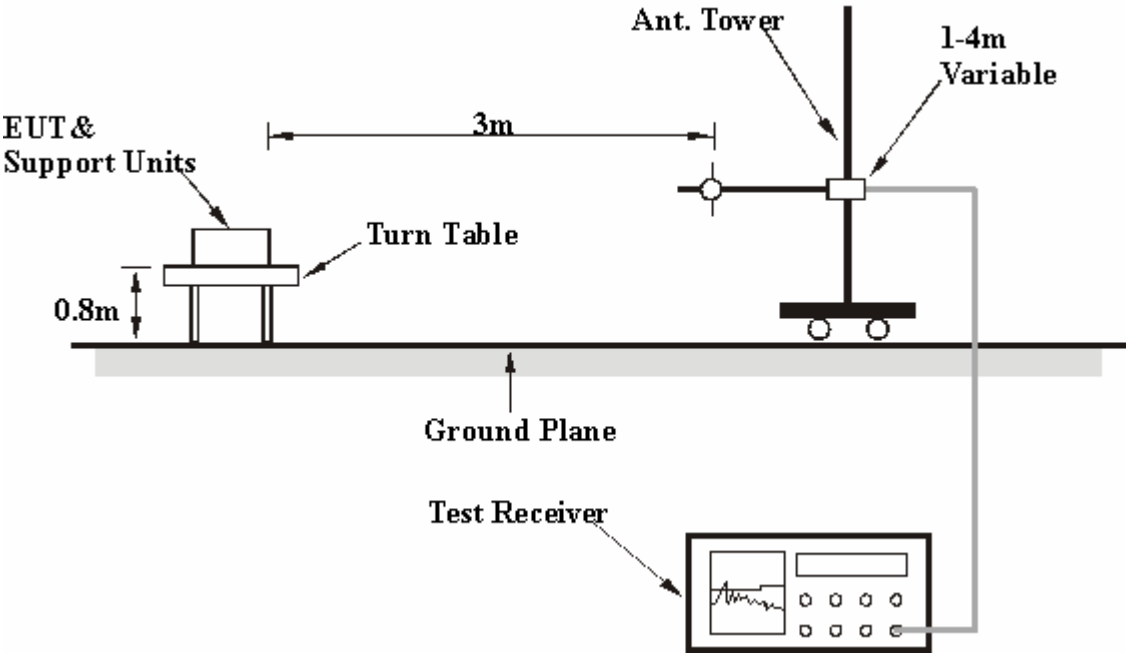
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz 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

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

4.2.7 TEST RESULTS

RADIATED WORST CASE DATA: BELOW 1GHz

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	GFSK	**DETECTOR FUNCTION**	Quasi-Peak
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 67%RH, 991hPa
TESTED BY	Lori Chiu		

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	288.54	31.87 QP	46.00	-14.13	1.00 H	327	17.85	14.03
2	300.20	26.34 QP	46.00	-19.66	2.00 H	282	11.83	14.52
3	440.16	26.86 QP	46.00	-19.14	2.50 H	30	9.53	17.34
4	479.04	30.24 QP	46.00	-15.76	2.50 H	346	12.09	18.15
5	700.64	33.54 QP	46.00	-12.46	2.50 H	206	11.13	22.41
6	799.78	26.13 QP	46.00	-19.87	1.00 H	156	2.14	23.98
7	900.86	33.10 QP	46.00	-12.90	1.00 H	289	8.13	24.97

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	59.16	26.97 QP	40.00	-13.03	1.00 V	232	13.84	13.13
2	125.25	29.70 QP	43.50	-13.80	1.00 V	232	18.96	10.73
3	288.54	38.91 QP	46.00	-7.09	1.00 V	346	24.89	14.03
4	681.20	32.07 QP	46.00	-13.93	1.00 V	232	10.06	22.00
5	700.64	37.93 QP	46.00	-8.07	1.50 V	61	15.52	22.41
6	766.73	33.70 QP	46.00	-12.30	1.50 V	42	9.77	23.93
7	799.78	32.93 QP	46.00	-13.07	1.00 V	156	8.94	23.98
8	900.86	33.03 QP	46.00	-12.97	1.00 V	232	8.06	24.97
9	945.57	34.38 QP	46.00	-11.62	1.00 V	276	7.24	27.14

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.

RADIATED WORST CASE DATA: ABOVE 1GHz

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH, 991hPa
TESTED BY	Lori Chiu		

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	1500.00	40.24 PK	74.00	-33.76	1.38 H	323	12.17	28.07
2	1500.00	32.91 AV	54.00	-21.09	1.38 H	323	4.84	28.07
3	2390.00	27.47 PK	74.00	-46.53	1.25 H	119	-3.74	31.21
4	2390.00	17.97 AV	54.00	-36.03	1.25 H	119	-13.24	31.21
5	*2402.00	83.83 PK			1.25 H	119	52.63	31.20
6	*2402.00	53.83 AV			1.25 H	119	22.63	31.20
7	4804.00	51.47 PK	74.00	-22.53	1.24 H	330	15.09	36.38
8	4804.00	21.47 AV	54.00	-32.53	1.24 H	330	-14.91	36.38

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)	Correction Factor (dB/m)
1	1500.00	46.54 PK	74.00	-27.46	1.11 V	184	18.47	28.07
2	1500.00	43.48 AV	54.00	-10.52	1.11 V	184	15.41	28.07
3	2390.00	39.65 PK	74.00	-34.35	1.13 V	193	8.44	31.21
4	2390.00	30.15 AV	54.00	-23.85	1.13 V	193	-1.06	31.21
5	*2402.00	96.01 PK			1.13 V	193	64.81	31.20
6	*2402.00	66.01 AV			1.13 V	193	34.81	31.20
7	2560.00	48.10 PK	76.01	-27.91	1.20 V	177	16.71	31.38
8	2560.00	45.07 AV	46.01	-0.94	1.20 V	177	13.68	31.38
9	4804.00	60.83 PK	74.00	-13.17	1.21 V	6	24.45	36.38
10	4804.00	30.83 AV	54.00	-23.17	1.21 V	6	-5.55	36.38

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. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB.
6. Average value = peak reading –20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	GFSK	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 67%RH, 991hPa
TESTED BY	Lori Chiu		

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	1500.00	40.53 PK	74.00	-33.47	1.05 H	217	12.46	28.07
2	1500.00	33.01 AV	54.00	-20.99	1.05 H	217	4.94	28.07
3	*2441.00	83.97 PK			1.32 H	197	52.75	31.22
4	*2441.00	53.97 AV			1.32 H	197	22.75	31.22
5	4882.00	52.16 PK	74.00	-21.84	1.33 H	54	15.62	36.54
6	4882.00	22.16 AV	54.00	-31.84	1.33 H	54	-14.38	36.54

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	1500.00	46.37 PK	74.00	-27.63	1.13 V	154	18.30	28.07
2	1500.00	43.12 AV	54.00	-10.88	1.13 V	154	15.05	28.07
3	*2441.00	96.15 PK			1.27 V	185	64.93	31.22
4	*2441.00	66.15 AV			1.27 V	185	34.93	31.22
5	2560.00	48.24 PK	76.15	-27.91	1.22 V	210	16.86	31.38
6	2560.00	45.13 AV	46.15	-1.02	1.22 V	210	13.75	31.38
7	4882.00	61.12 PK	74.00	-12.88	1.34 V	221	24.58	36.54
8	4882.00	31.12 AV	54.00	-22.88	1.34 V	221	-5.42	36.54

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. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB.
6. Average value = peak reading –20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	GFSK	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 67%RH, 991hPa
TESTED BY	Lori Chiu		

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	1500.00	40.64 PK	74.00	-33.36	1.12 H	31	12.57	28.07
2	1500.00	33.15 AV	54.00	-20.85	1.12 H	31	5.08	28.07
3	*2480.00	84.02 PK			1.50 H	116	52.79	31.23
4	*2480.00	54.02 AV			1.50 H	116	22.79	31.23
5	2483.50	29.70 PK	74.00	-44.30	1.50 H	116	-1.53	31.23
6	2483.50	20.20 AV	54.00	-33.80	1.50 H	116	-11.03	31.23
7	4960.00	52.34 PK	74.00	-21.66	1.08 H	142	15.63	36.71
8	4960.00	22.34 AV	54.00	-31.66	1.08 H	142	-14.37	36.71

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	1500.00	46.23 PK	74.00	-27.77	1.10 V	254	18.16	28.07
2	1500.00	43.07 AV	54.00	-10.93	1.10 V	254	15.00	28.07
3	*2480.00	96.21 PK			1.46 V	125	64.98	31.23
4	*2480.00	66.21 AV			1.46 V	125	34.98	31.23
5	2483.50	41.89 PK	74.00	-32.11	1.45 V	123	10.66	31.23
6	2483.50	32.39 AV	54.00	-21.61	1.45 V	123	1.16	31.23
7	2560.00	48.12 PK	76.21	-28.09	1.35 V	42	16.74	31.38
8	**2560.00**	**45.57 AV**	**46.21**	**-0.64**	**1.35 V**	**42**	**14.19**	**31.38**
9	4960.00	61.10 PK	74.00	-12.90	1.42 V	342	24.39	36.71
10	4960.00	31.10 AV	54.00	-22.90	1.42 V	342	-5.61	36.71

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. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB.
6. Average value = peak reading –20log(duty cycle).

4.3 NUMBER OF HOPPING FREQUENCY USED

4.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

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 PROCEDURES

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.

c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.

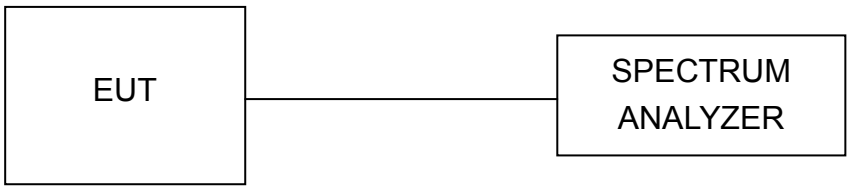
d. Set the SA on View mode and then plot the result on SA screen.

e. Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

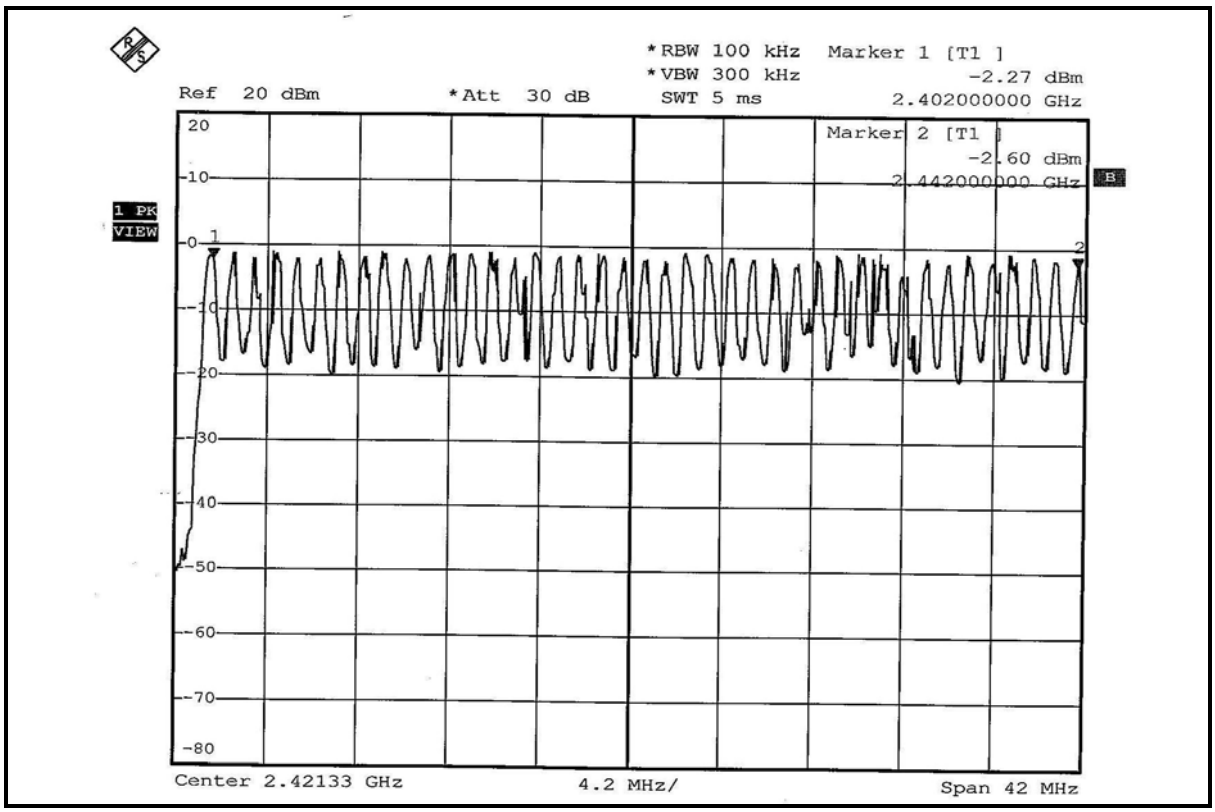
No deviation.

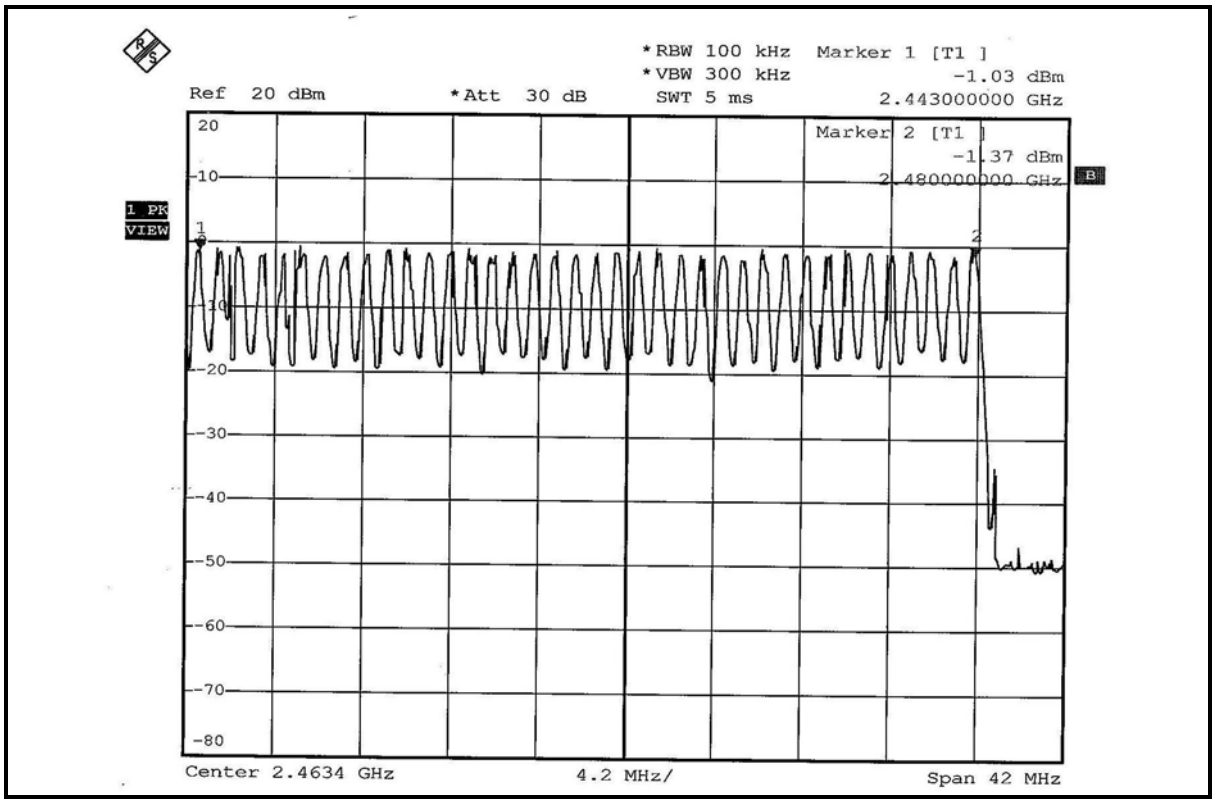
4.3.5 TEST SETUP



4.3.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.


*RBW 100 kHz
*VBW 300 kHz
SWT 5 ms
Marker 1 [T1]
-2.27 dBm
2.402000000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-2.60 dBm
2.442000000 GHz
1 PK
VIEW
B
Center 2.42133 GHz
4.2 MHz/
Span 42 MHz


*RBW 100 kHz
*VBW 300 kHz
SWT 5 ms
Marker 1 [T1]
-1.03 dBm
2.443000000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-1.37 dBm
2.480000000 GHz
1 PK
VIEW
B
Center 2.4634 GHz
4.2 MHz/
Span 42 MHz

4.4 DWELL TIME ON EACH CHANNEL

4.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

NOTES: 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

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.

c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.

d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.

e. Repeat above procedures until all different time-slot modes have been completed.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

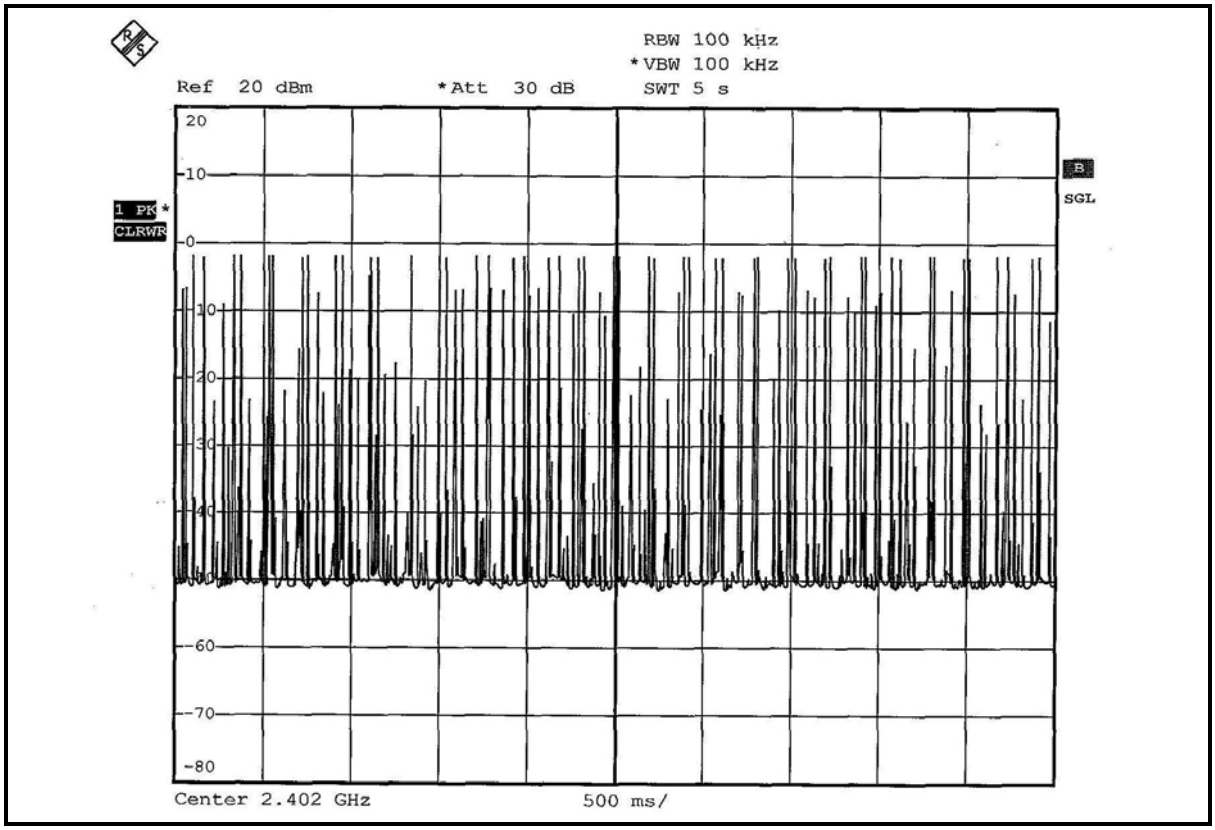
4.4.5 TEST SETUP

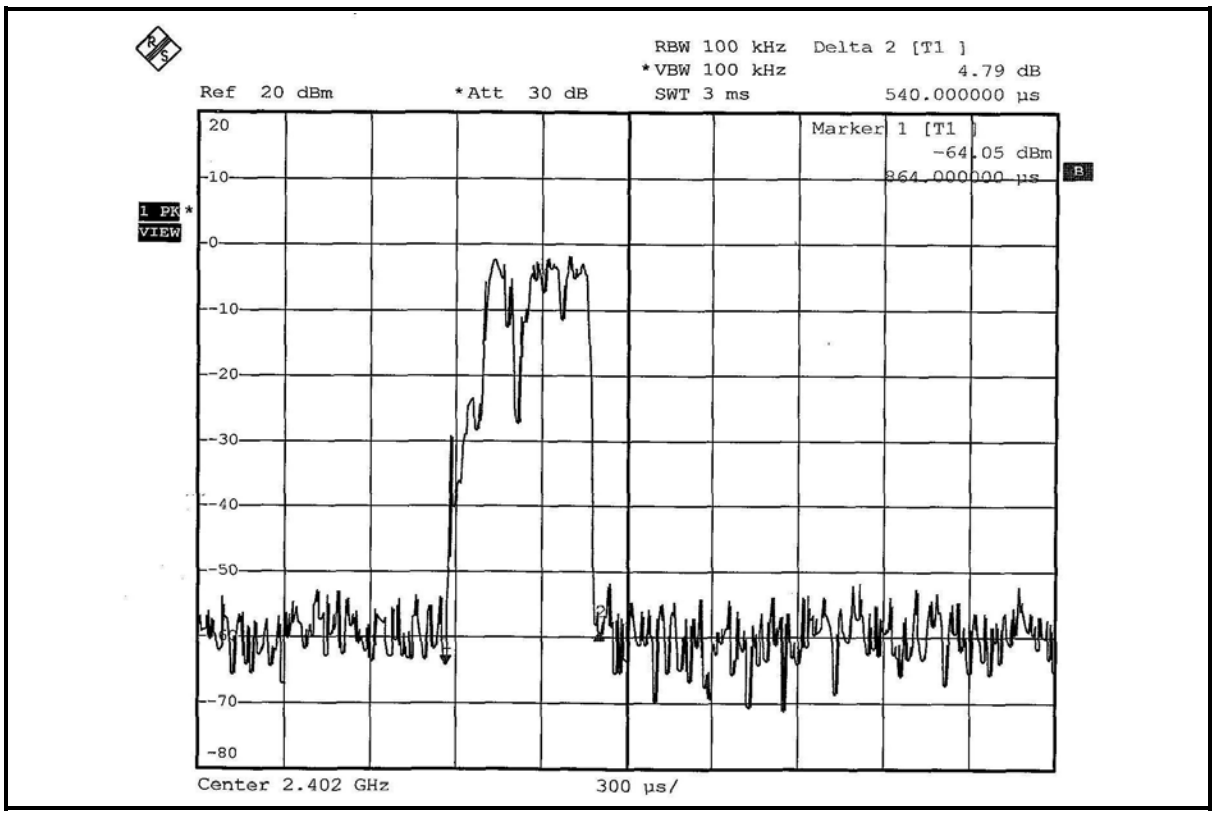
4.4.6 TEST RESULTS

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	49 (times / 5 sec) *6.32=309.68 times	0.540	167.227	400
DH3	26 (times / 5 sec) *6.32=164.32 times	1.812	297.748	400
DH5	17 (times / 5 sec) *6.32=107.44 times	3.060	328.766	400

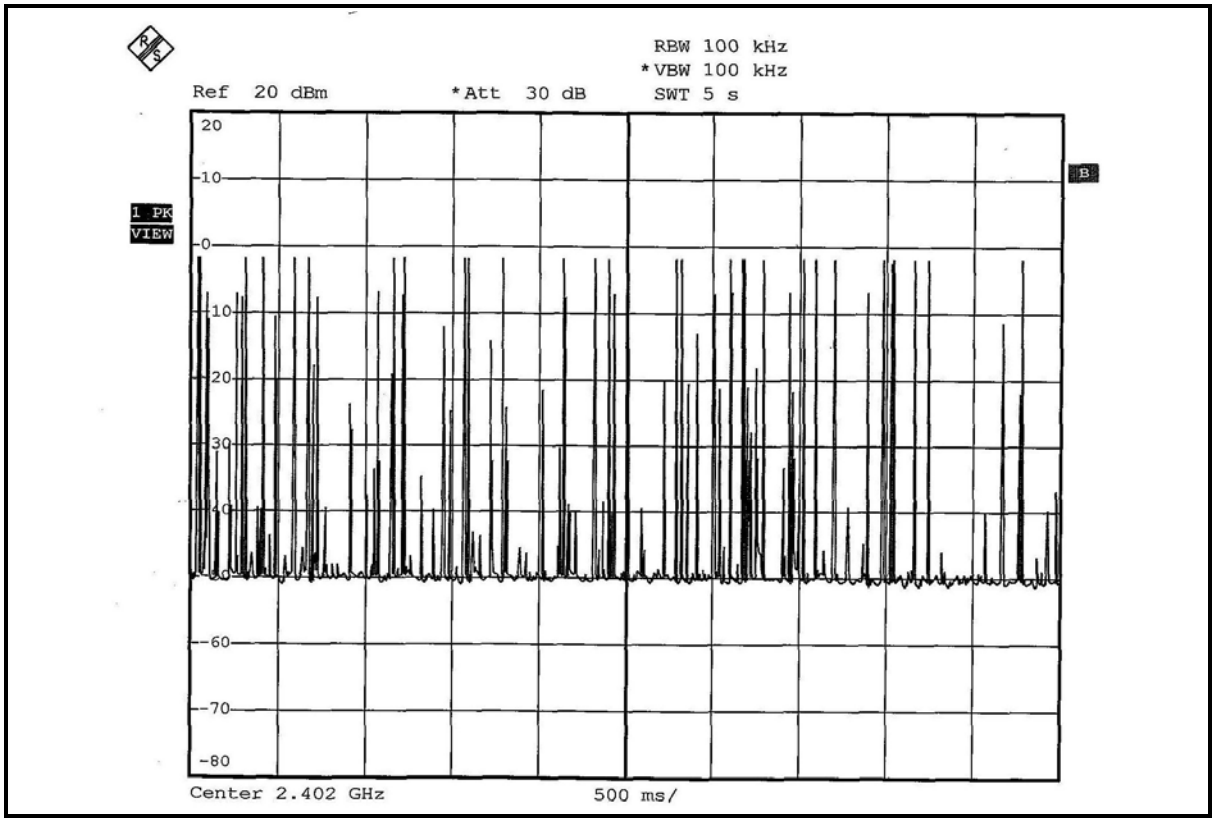
NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

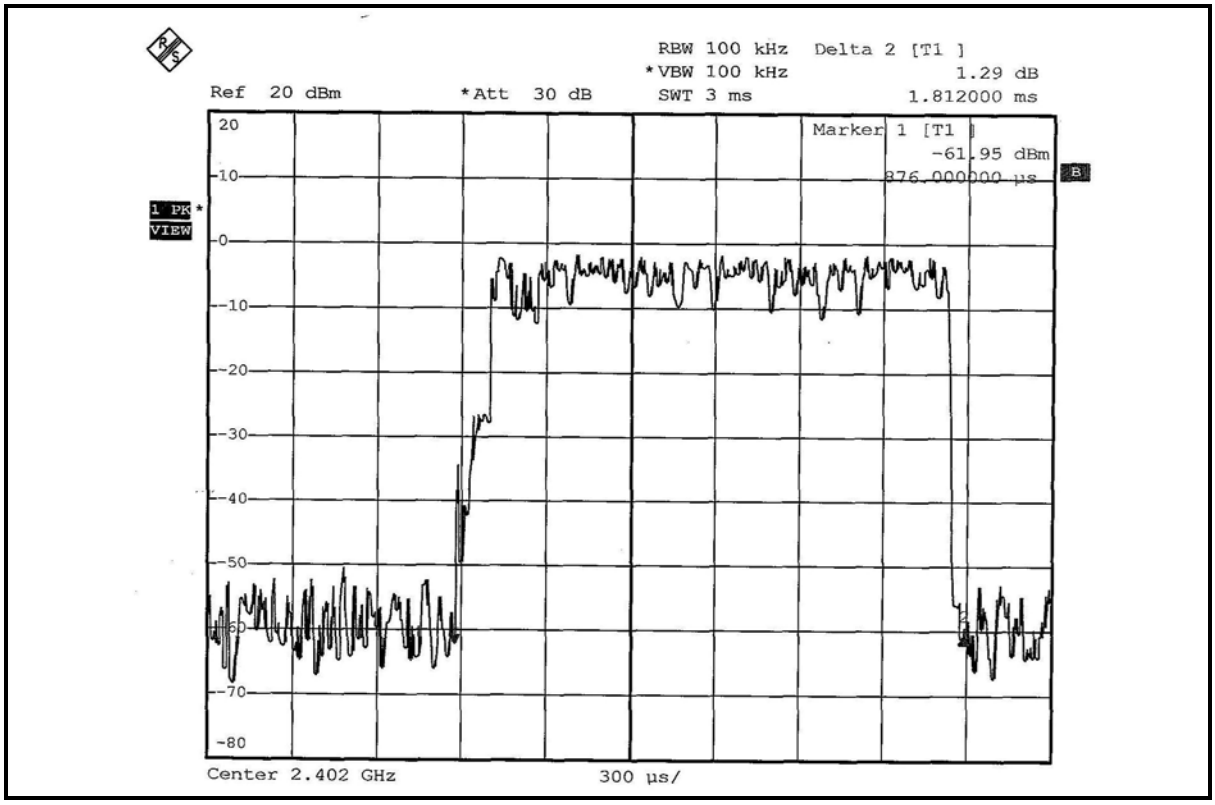
DH1


RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 5 s
1 PK *
CLRWR
B
SGL
Center 2.402 GHz
500 ms/

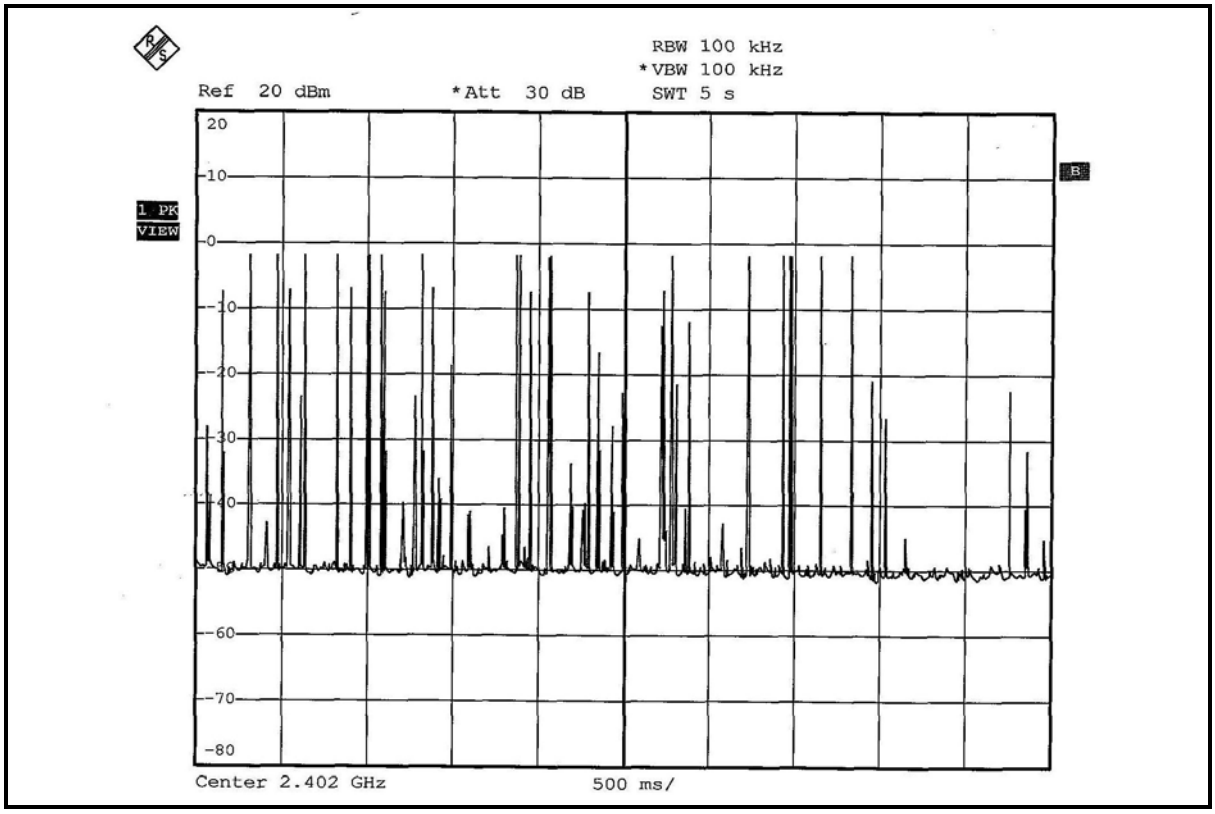

RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
4.79 dB
Ref 20 dBm
*Att 30 dB
SWT 3 ms
540.000000 µs
Marker 1 [T1]
-64.05 dBm
864.000000 µs
1 PK *
VIEW
B
Center 2.402 GHz
300 µs/

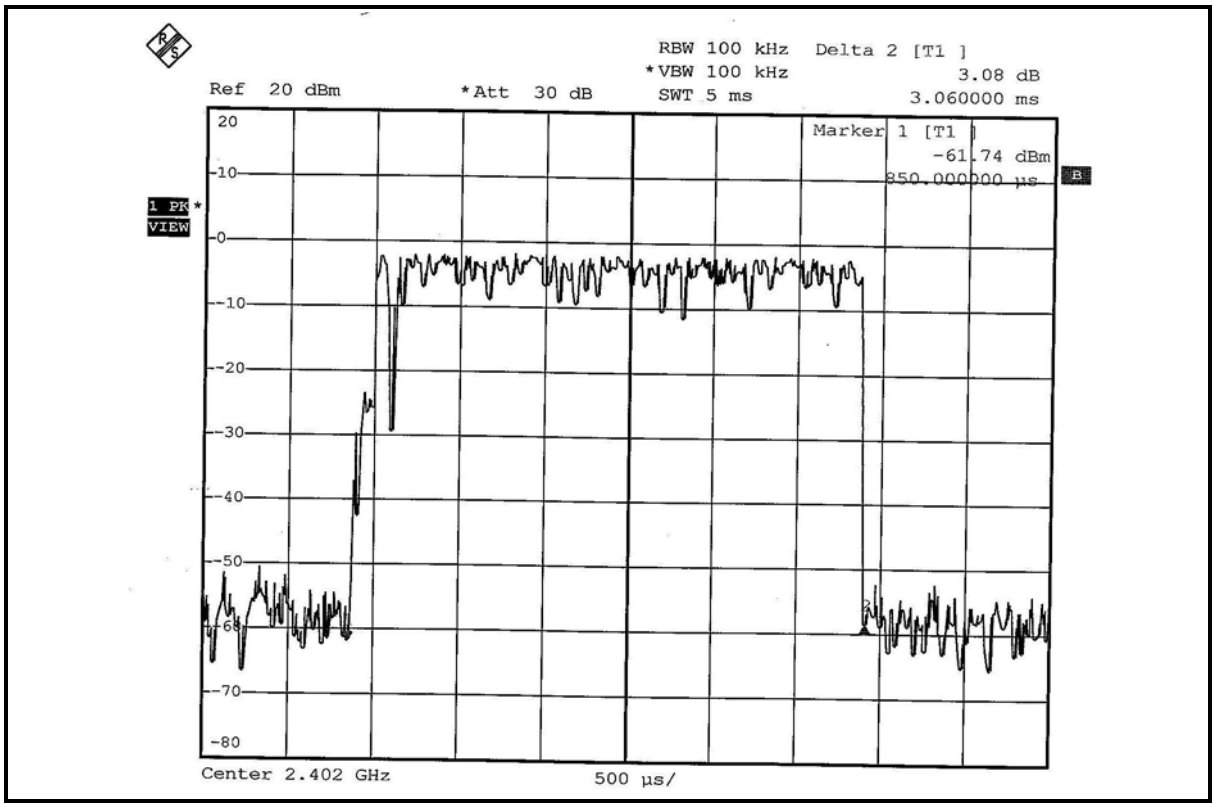
DH3


RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
B
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.402 GHz
500 ms/


RBW 100 kHz
*VBW 100 kHz
SWT 3 ms
Delta 2 [T1]
1.29 dB
1.812000 ms
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-61.95 dBm
876.000000 µs
1 PK*
VIEW
B
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.402 GHz
300 µs/

DH5


RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
B
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.402 GHz
500 ms/


RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
3.08 dB
3.060000 ms
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-61.74 dBm
850.000000 µs
1 PK
VIEW
B
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.402 GHz
500 µs/

4.5 CHANNEL BANDWIDTH

4.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dB bandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

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

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b. 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.

c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.

d. Repeat above procedures until all frequencies measured were complete.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP

4.5.6 EUT OPERATING CONDITION

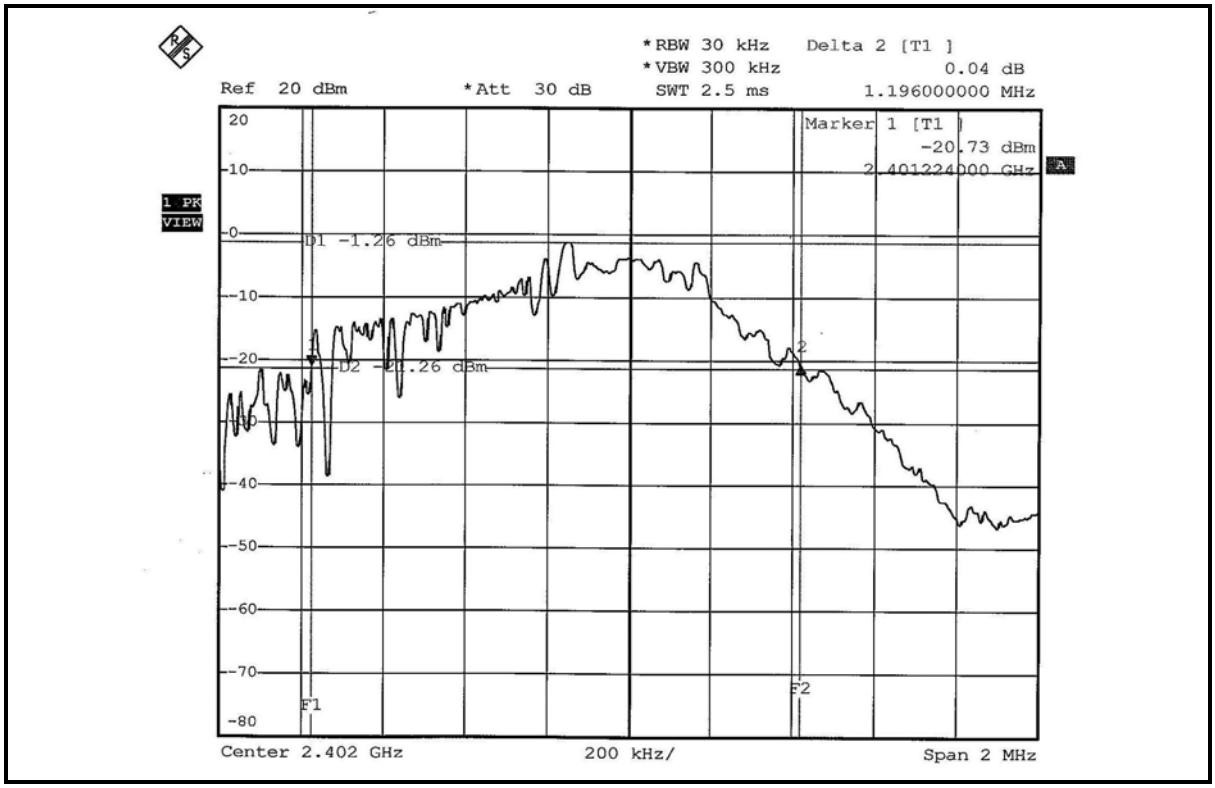
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.5.7 TEST RESULTS

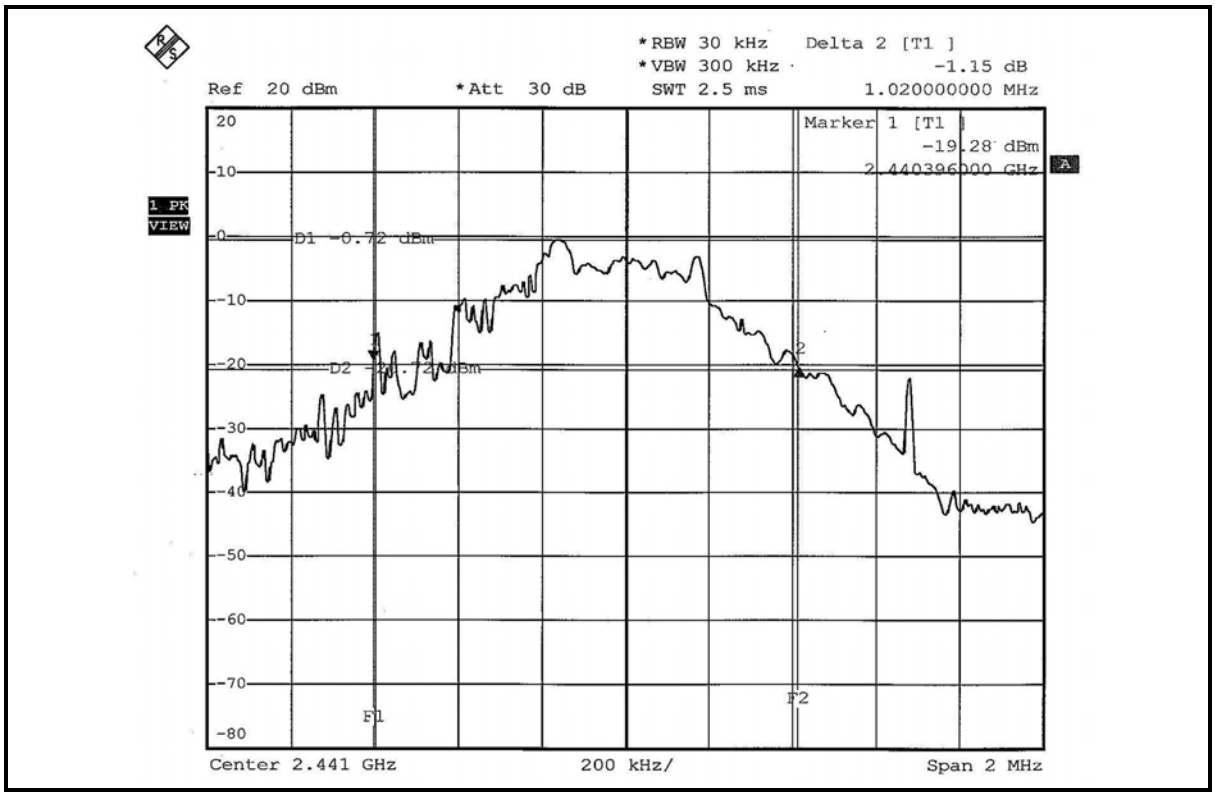
MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.196
39	2441	1.020
78	2480	1.006

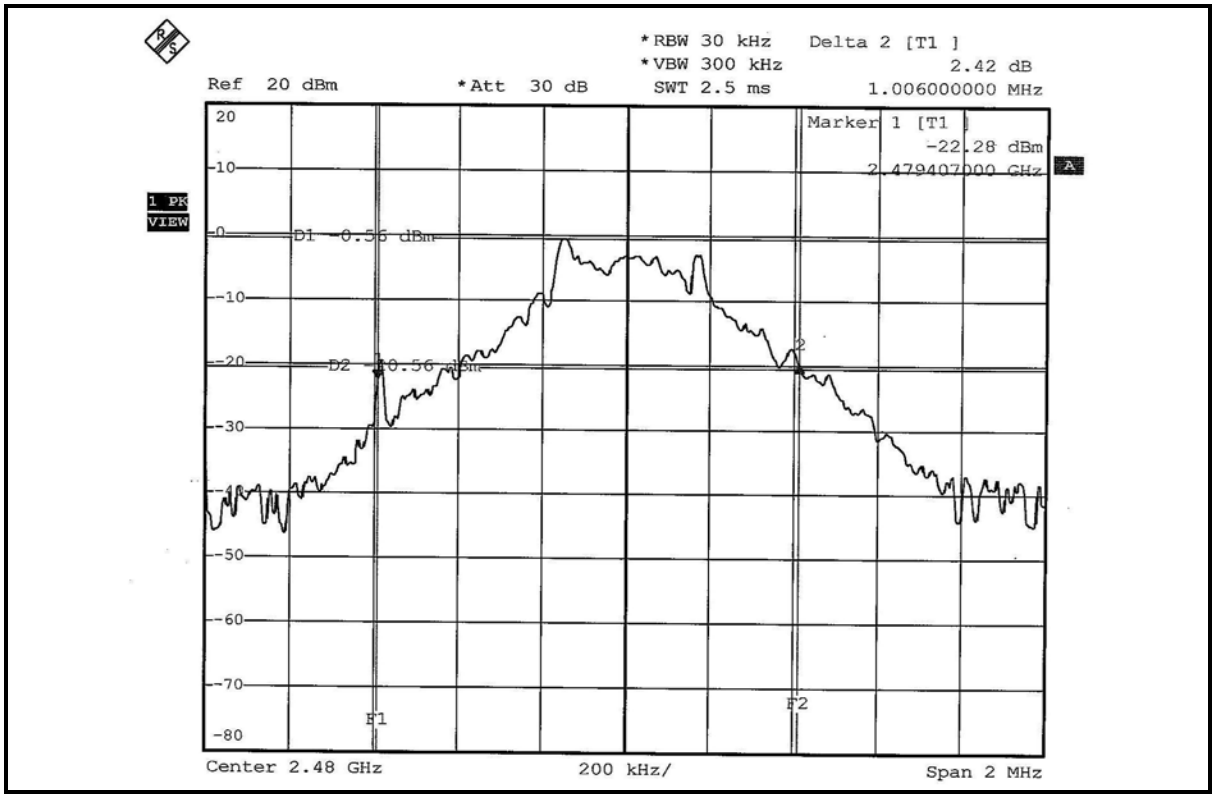
CH 0


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
0.04 dB
1.196000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-20.73 dBm
2.401224000 GHz
1 PK
VIEW
A
D1 -1.26 dBm
D2 -21.26 dBm
F1
F2
Center 2.402 GHz
200 kHz/
Span 2 MHz

CH 39


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
-1.15 dB
1.020000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-19.28 dBm
2.440396000 GHz
1 PK
VIEW
A
D1 -0.72 dBm
D2 -20.72 dBm
F1
F2
Center 2.441 GHz
200 kHz/
Span 2 MHz

CH 78


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 2 [T1]
2.42 dB
1.006000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-22.28 dBm
2.479407000 GHz
1 PK
VIEW
A
D1 -0.55 dBm
D2 -10.56 dBm
F1
F2
Center 2.48 GHz
200 kHz/
Span 2 MHz

4.6 HOPPING CHANNEL SEPARATION

4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

NOTES: 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.
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.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP

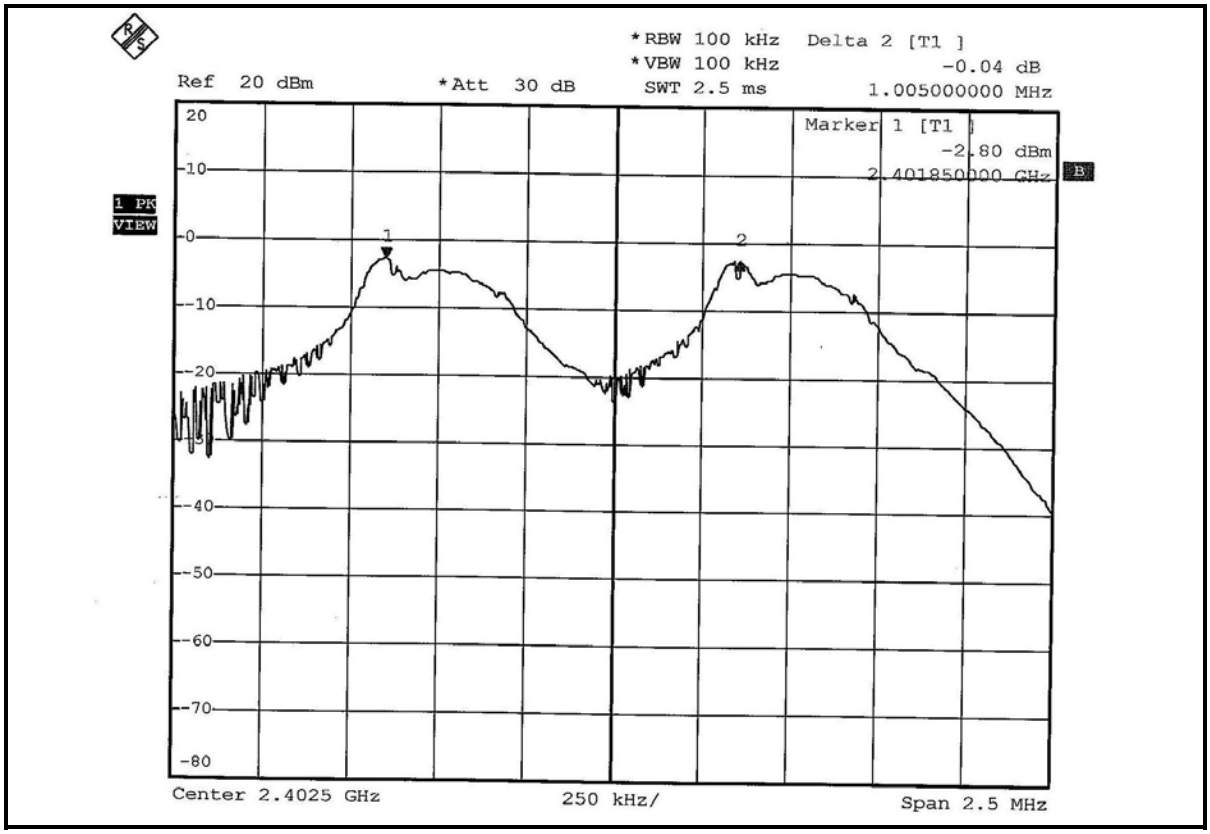
4.6.6 TEST RESULTS

MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

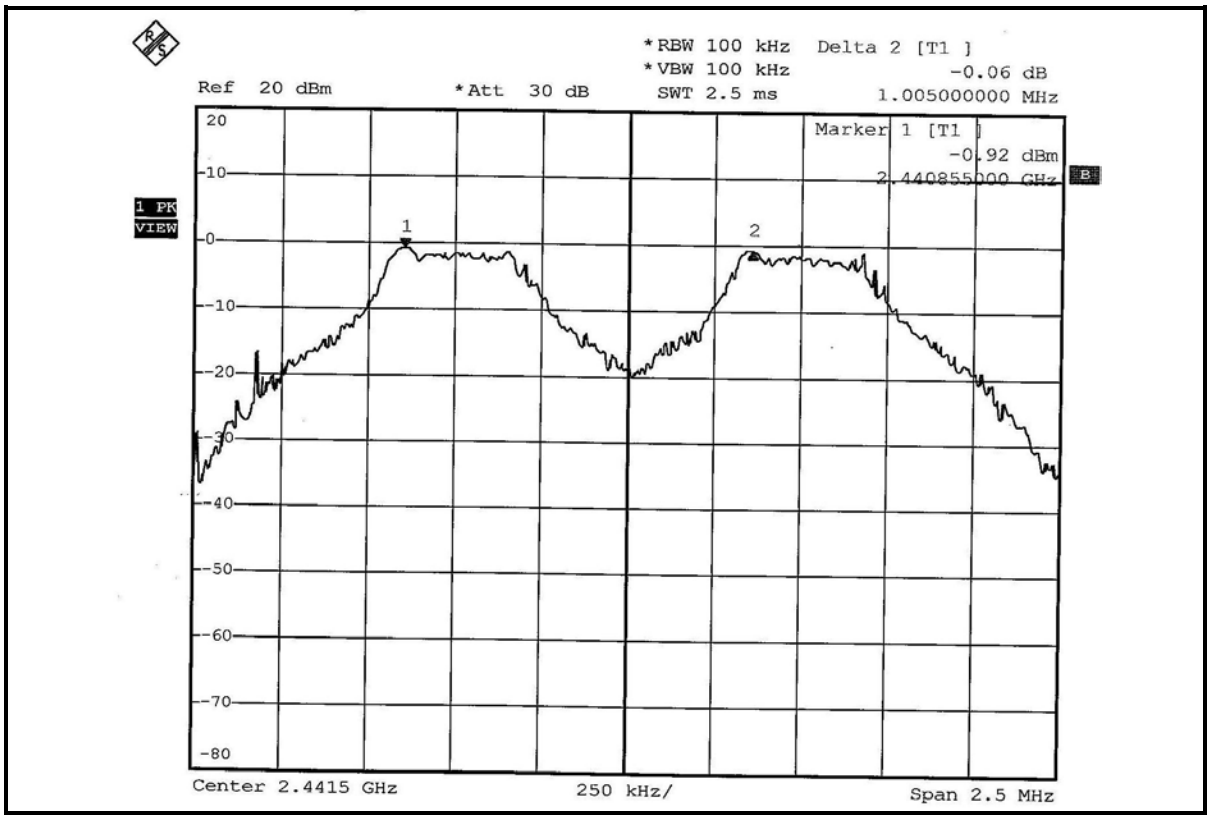
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.005	1.196	0.797	PASS
39	2441	1.005	1.020	0.680	PASS
78	2480	1.020	1.006	0.671	PASS

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

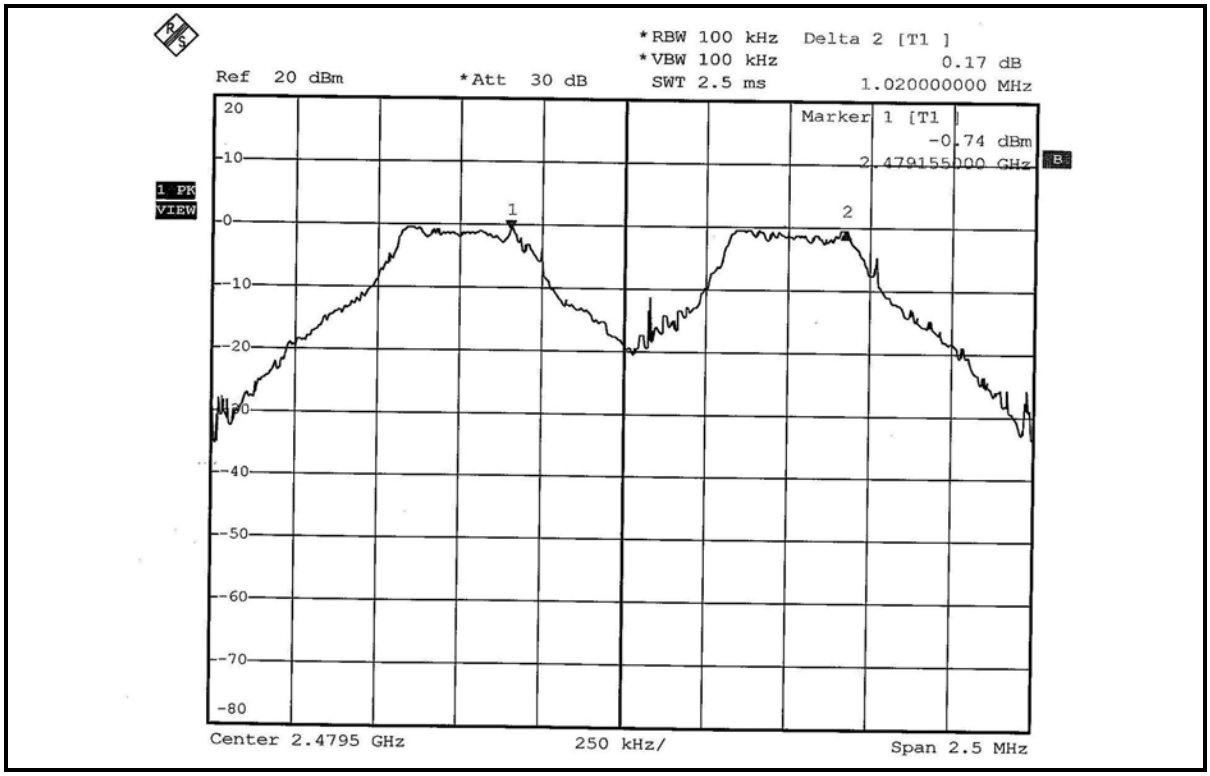
CH 0


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.04 dB
1.005000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-2.80 dBm
2.401850000 GHz
1 PK
VIEW
Center 2.4025 GHz
250 kHz/
Span 2.5 MHz

CH 39


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
-0.06 dB
1.005000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-0.92 dBm
2.440855000 GHz
1 PK
VIEW
Center 2.4415 GHz
250 kHz/
Span 2.5 MHz

CH 78


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Delta 2 [T1]
0.17 dB
1.020000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-0.74 dBm
2.479155000 GHz
1 PK
VIEW
B
Center 2.4795 GHz
250 kHz/
Span 2.5 MHz

4.7 MAXIMUM PEAK OUTPUT POWER

4.7.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 125mW.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

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

4.7.3 TEST PROCEDURES

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b. 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.

c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3MHz RBW and 10 MHz VBW.

d. Measure the captured power within the band and recording the plot.

e. Repeat above procedures until all frequencies required were complete.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP

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

4.7.6 EUT OPERATING CONDITION

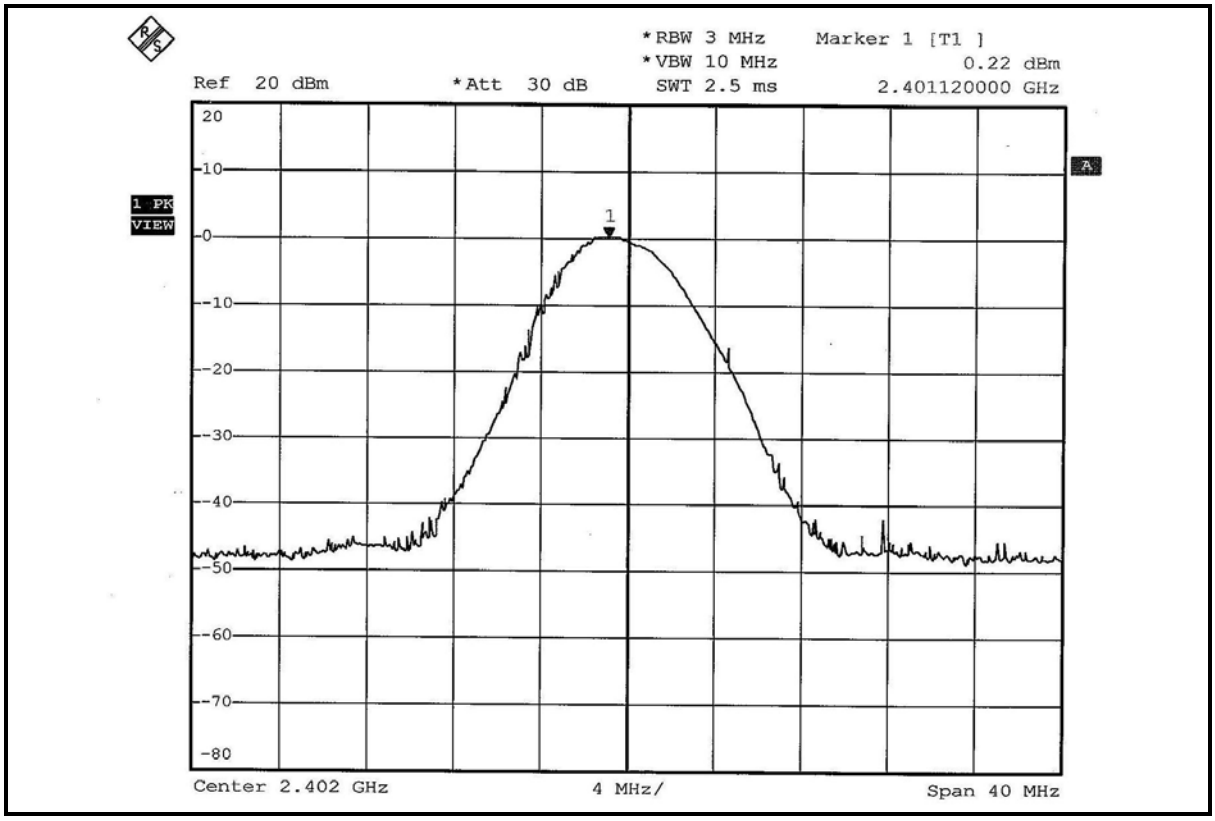
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.7.7 TEST RESULTS

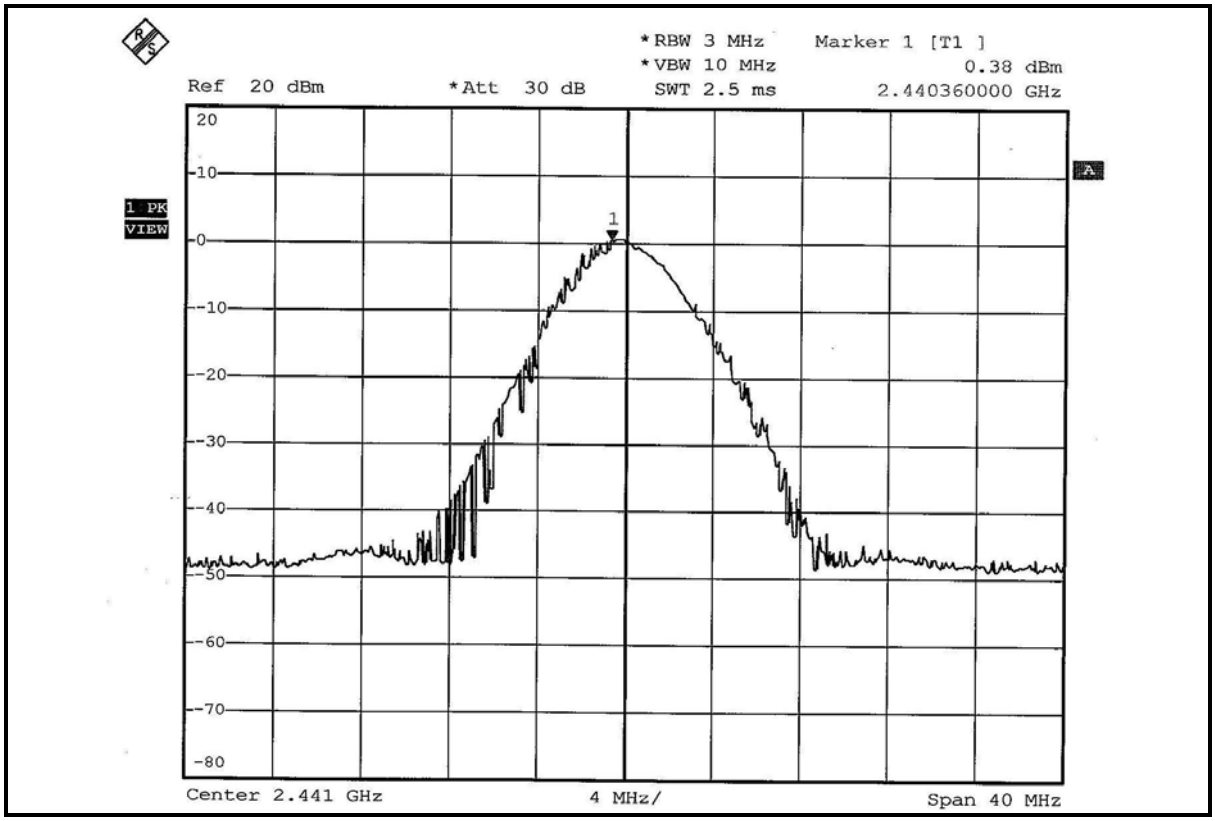
MODULATION TYPE	GFSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Long Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	1.052	0.22	125	PASS
39	2441	1.091	0.38	125	PASS
78	2480	0.914	-0.39	125	PASS

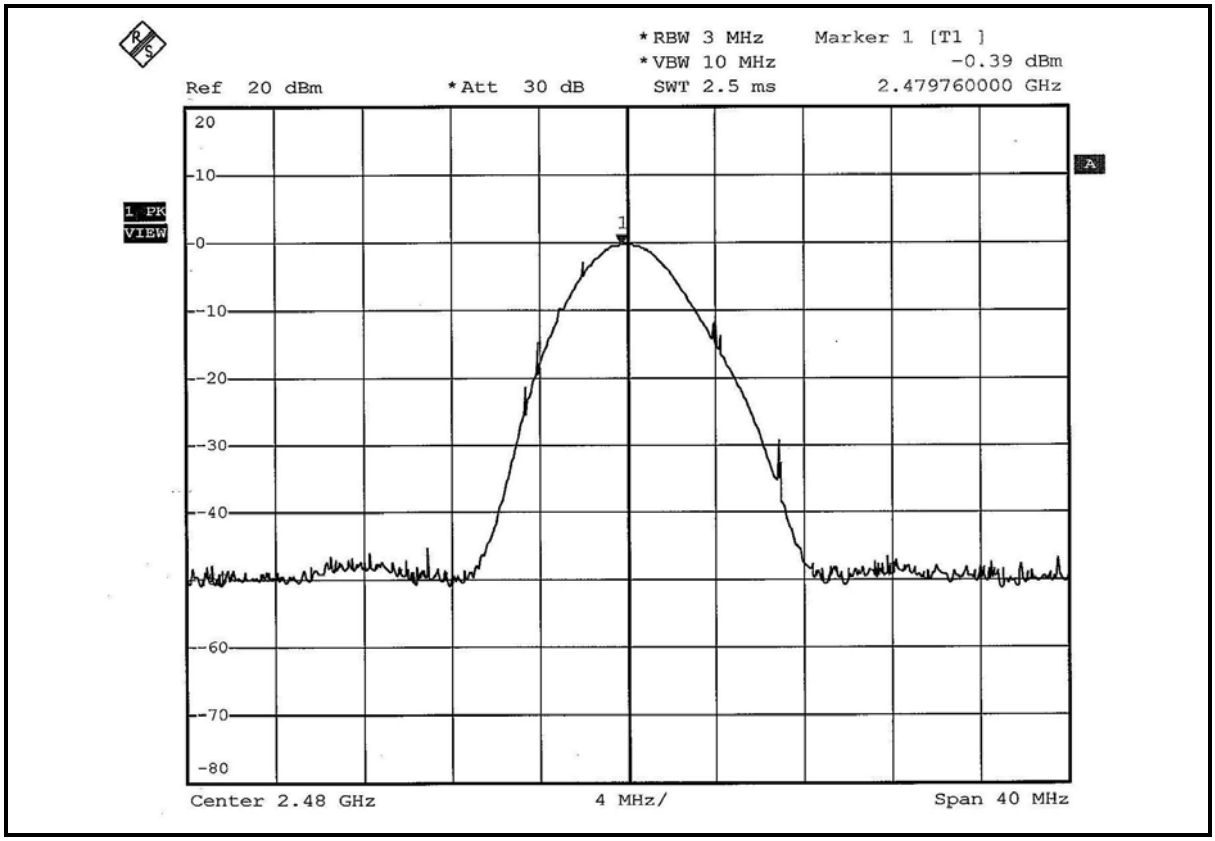
CH 0


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
0.22 dBm
2.401120000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.402 GHz
4 MHz/
Span 40 MHz

CH 39


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
0.38 dBm
2.440360000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.441 GHz
4 MHz/
Span 40 MHz

CH 78


*RBW 3 MHz
*VBW 10 MHz
SWT 2.5 ms
Marker 1 [T1]
-0.39 dBm
2.479760000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-30
-40
-60
-70
-80
Center 2.48 GHz
4 MHz/
Span 40 MHz

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 RBW).

4.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

NOTES: 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 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

4.8.5 EUT OPERATING CONDITION

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

4.8.6 TEST RESULTS

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

NOTE 1:
The band edge emission plot on the next page shows 47.62dBc between carrier maximum power and local maximum emission in restrict band (2.34000GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 96.01dBuV/m (Peak), so the maximum field strength in restrict band is 96.01 – 47.62= 48.39dBuV/m, which is under 74 dBuV/m limit.

Average value = 48.39-30.00=18.39dBuV/m, which is under 54dBuV/m limit.

*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB.

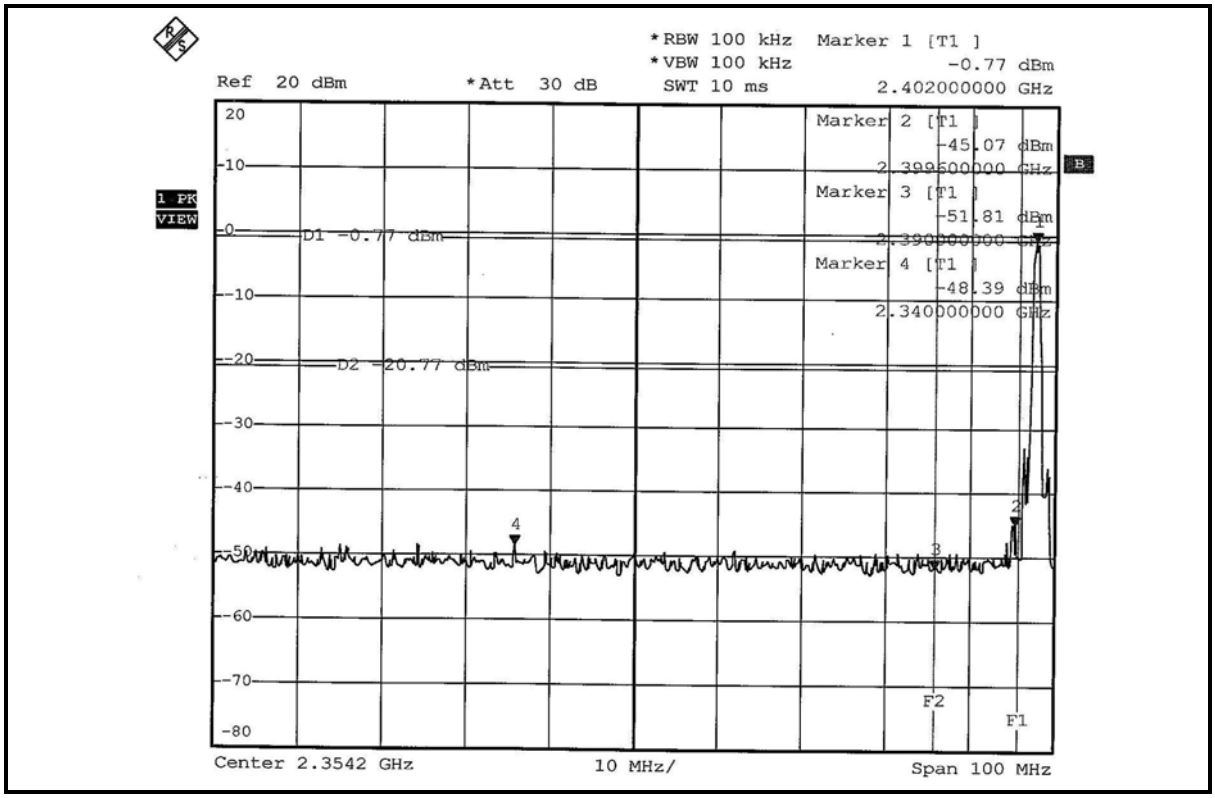
Average value = peak reading –30.00.

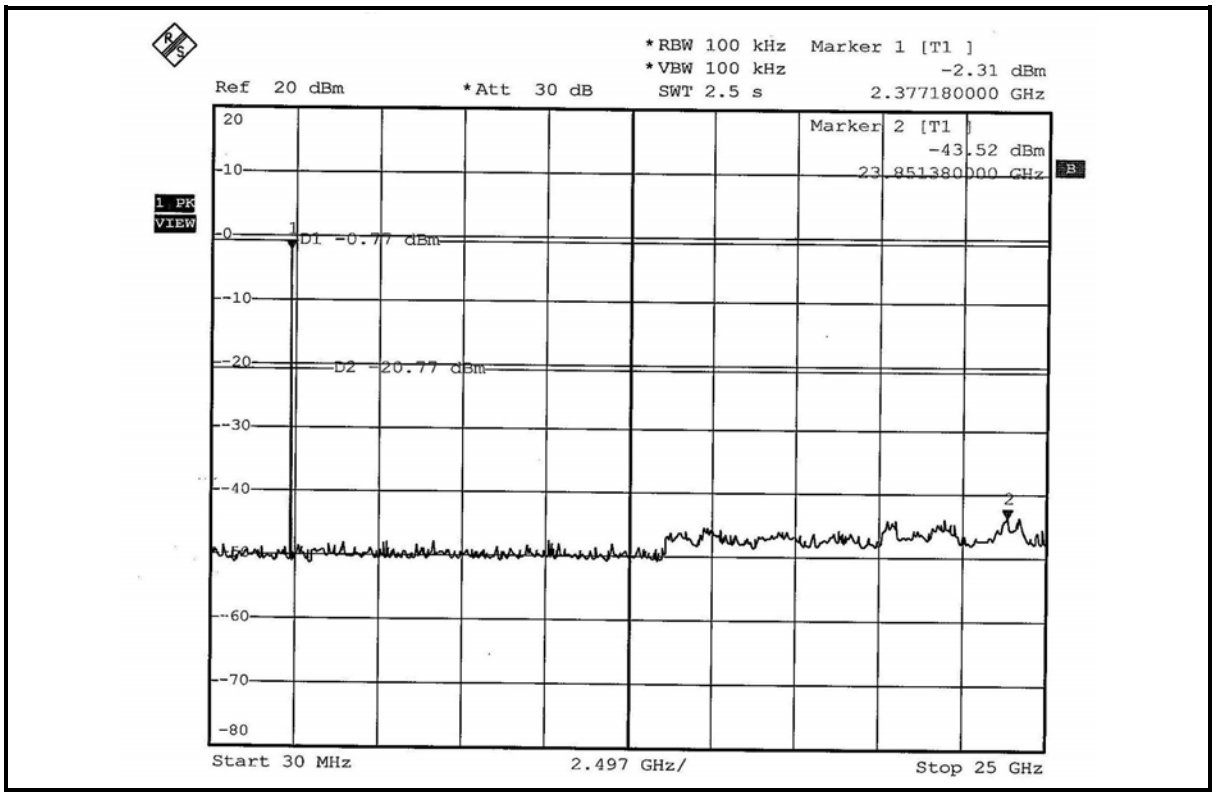
NOTE 2:
The band edge emission plot on the next second page shows 48.50dBc between carrier maximum power and local maximum emission in restrict band (2.48398GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 96.21dBuV/m (Peak), so the maximum field strength in restrict band is 96.21 – 48.50 = 47.71dBuV/m, which is under 74 dBuV/m limit.

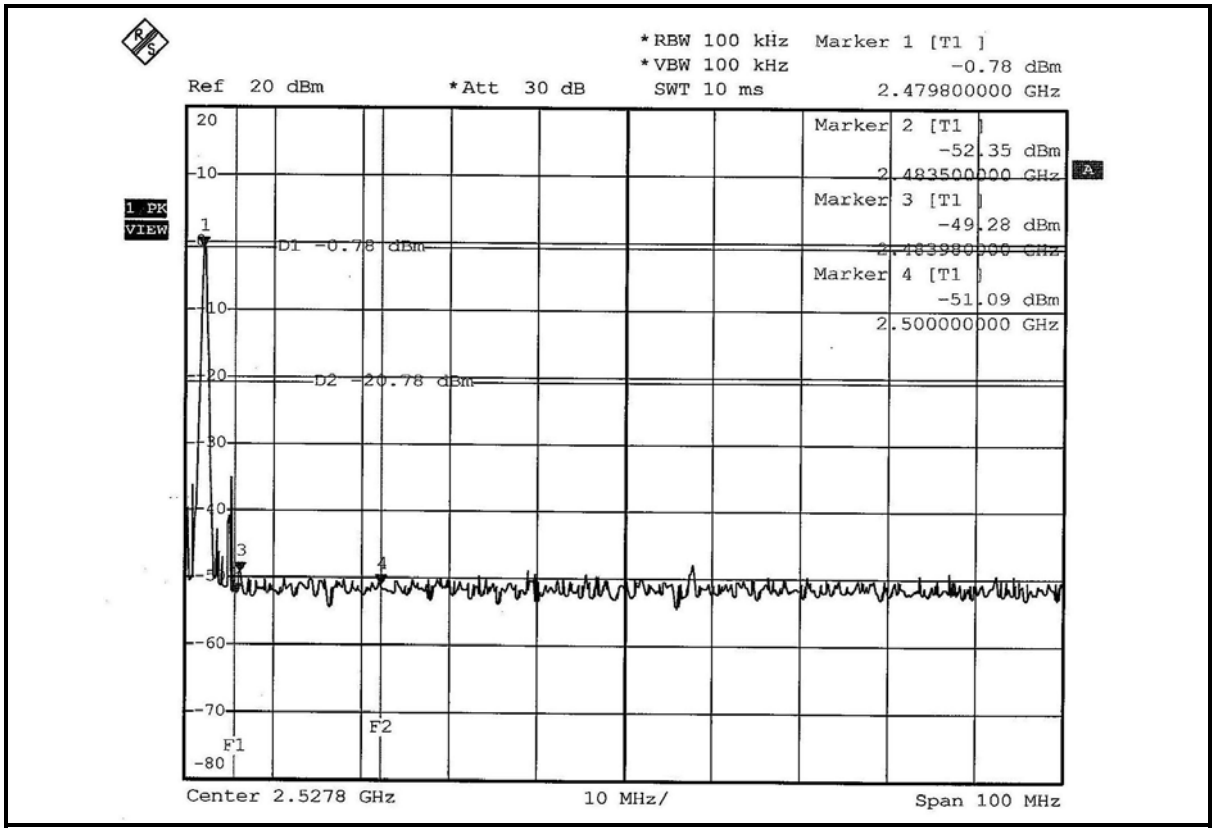
Average value = 47.71-30.00=17.71dBuV/m, which is under 54dBuV/m limit.

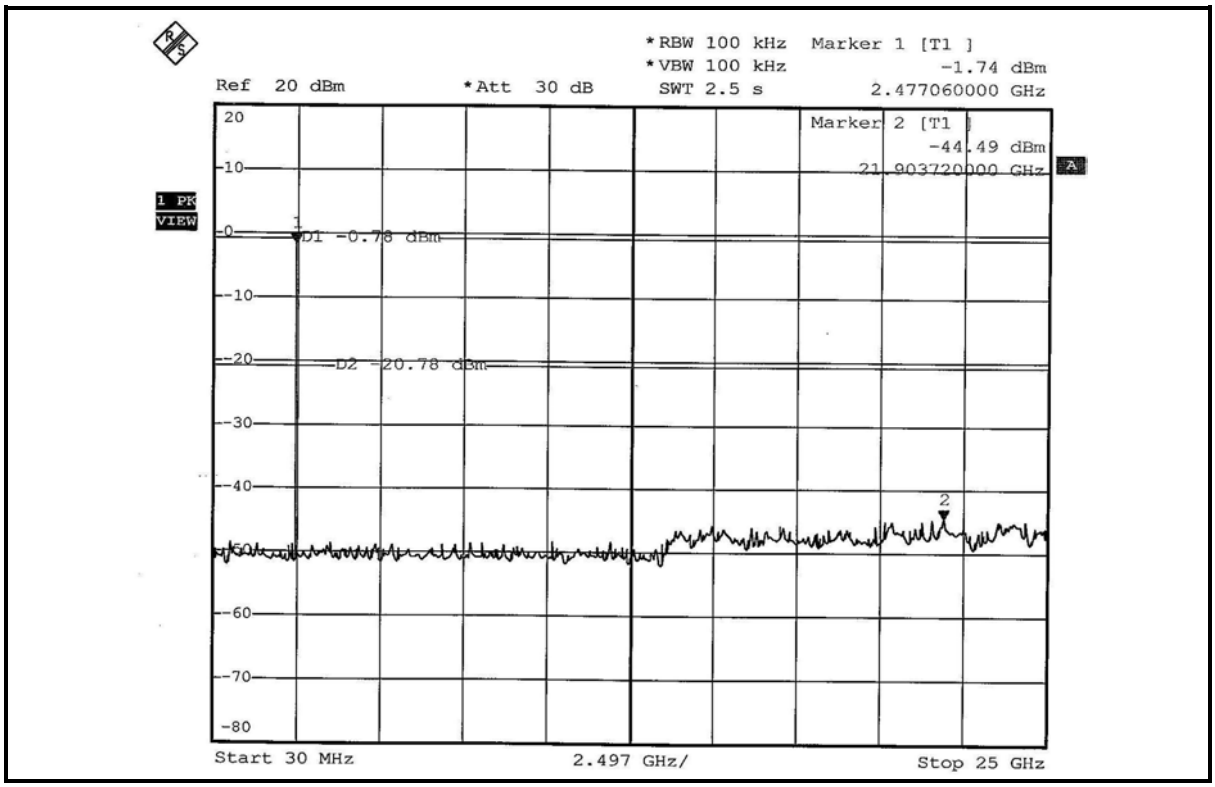
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30 dB.

Average value = peak reading –30.00.


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-0.77 dBm
2.402000000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-45.07 dBm
2.399500000 GHz
Marker 3 [T1]
-51.81 dBm
2.390000000 GHz
Marker 4 [T1]
-48.39 dBm
2.340000000 GHz
1 PK
VIEW
D1 -0.77 dBm
D2 -20.77 dBm
F2
F1
Center 2.3542 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-2.31 dBm
2.377180000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-43.52 dBm
23.851380000 GHz
1 PK
VIEW
D1 -0.77 dBm
D2 -20.77 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
-0.78 dBm
2.479800000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-52.35 dBm
2.483500000 GHz
Marker 3 [T1]
-49.28 dBm
2.483980000 GHz
Marker 4 [T1]
-51.09 dBm
2.500000000 GHz
1 PK
VIEW
A
D1 -0.78 dBm
D2 -20.78 dBm
F1
F2
Center 2.5278 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-1.74 dBm
2.477060000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-44.49 dBm
21.903720000 GHz
1 PK
VIEW
A
D1 -0.78 dBm
D2 -20.78 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

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 PIFA antenna without antenna connector. The maximum gain of this antenna is 0dBi.

5. 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.

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, NCC
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: 886-2-26051924

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.

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.