FCC TEST REPORT

REPORT NO.:	RF980505A01B
MODEL NO.:	BH-106
VERSION:	HW: 0.41, SW: 1.0, MV: 0.4, Proto: B4.11
RECEIVED:	June 1, 2009
TESTED:	June 11 ~ 18, 2009
ISSUED:	June 22, 2009

APPLICANT:	Nokia(China) Investment Co., LTD.
ADDRESS:	B2, Nokia China Campus.Beijing Economic and Tech Development Area, No.5. Donghuan Zhonglu.P.O. Box 100176, Beijing, China

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB LOCATION:	No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien, 244 Taiwan

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1. CERTIFICATION

PRODUCT:	Bluetooth Headset
BRAND NAME:	NOKIA
MODEL NO.:	BH-106
APPLICANT:	Nokia(China) Investment Co., LTD.
TESTED:	June 11 ~ 18, 2009
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, 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:** June 22, 2009
(Annie Chang / Senior Specialist)

TECHNICAL ACCEPTANCE : Jamison Chan , **DATE:** June 22, 2009
Responsible for RF
(Jamison Chan / Supervisor)

APPROVED BY : Ken Liu , **DATE:** June 22, 2009
(Ken Liu / Assistant 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	Refer to Note below
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) 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. 21dBm (see Note)	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 –5.10dB at 2390.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.

NOTE: 1. 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. No need to re-tested the AC Power Conducted Emission due to the change should not influence test result.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 1GHz	3.72 dB
	1GHz ~ 40GHz	2.89 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth Headset
MODEL NO.	BH-106
FCC ID	QTLBH-106
POWER SUPPLY	5Vdc from adapter, 3.7Vdc from battery
MODULATION TYPE	GFSK, π /4-DQPSK, 8DPSK
RADIO TECHNOLOGY	FHSS
TRANSFER RATE	1/2/3Mbps
OPERATING FREQUENCY	2402 ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	4.786mW
ANTENNA TYPE	IFA antenna with 2.82dBi gain
I/O PORTS	N/A
DATA CABLE	N/A
ASSOCIATED DEVICES	Refer to note 4 below

NOTE:

1. This report is a supplementary report or original one (BV CPS report no.: RF980505A01) issued on May 15, 2009 to verify test result for some electronic and mechanical changes. The main change is adding the second source of following components:
   - ✧ Battery ✧ PCB ✧ Speaker ✧ EEPROM
   - ✧ Metal ring ✧ MIC ✧ Balun filter ✧ DC Jack
2. This report is prepared for FCC class II permissive change.
3. The EUT is a Bluetooth Headset.
4. The EUT was power supplied from the following power adapter or battery:

Item	Brand	Model	Spec.
Adapter	NOKIA	AC-3U	AC I/P: 100-240V, 50-60Hz, 65mA DC O/P: 5.0V, 350mA Non-shielded DC (1.8m), AC 2-pin
Battery	-	-	3.7Vdc

5. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

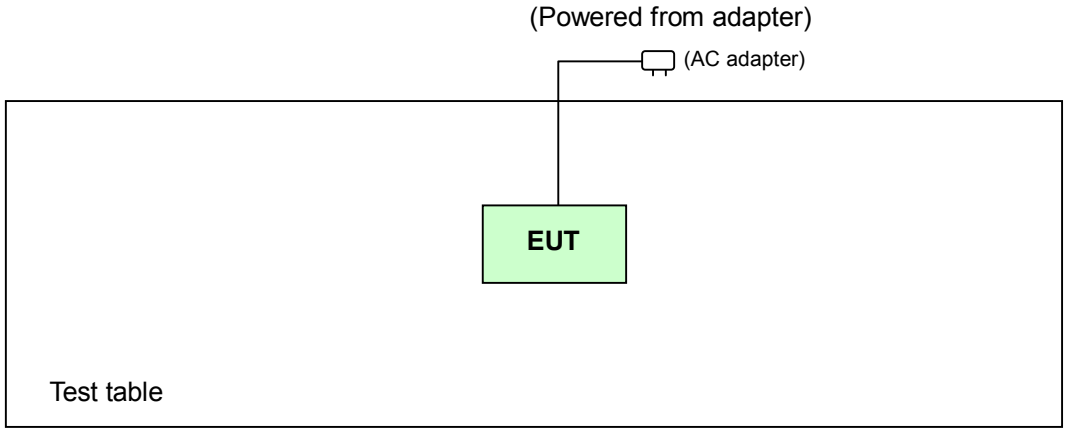
3.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

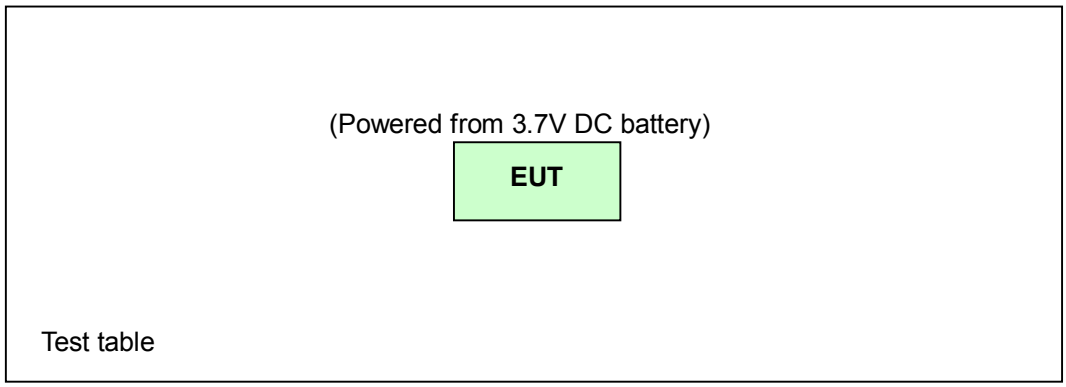
CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	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	2432	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

FOR MODE A:



FOR MODE B:



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
A	Note 1	√	√	√	Operating Mode (EUT+Adapter)
B	Note 2	√	-	-	Operating Mode (EUT only)

Where **PLC:** Power Line Conducted Emission **RE<1G:** Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

NOTE: 1. No need to re-tested the Conducted Emission due to the change should not influence test result.

2. 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, data rates, packet types data rate, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	DATE RATE	AXIS
A	0 to 78	0	FHSS	GFSK	DH5	1	X
B	0 to 78	0	FHSS	GFSK	DH5	1	X

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, packet types data rate, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	DATE RATE	AXIS
A	0 to 78	0, 39, 78	FHSS	GFSK	DH5	1	X
A	0 to 78	0, 39, 78	FHSS	8DPSK	DH5	3	X

BANDEDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types of the antenna and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	DATE RATE
A	0 to 78	0, 78	FHSS	GFSK	DH5	1
A	0 to 78	0, 78	FHSS	8DPSK	DH5	3

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 of the antenna and antenna ports (if EUT with antenna diversity architecture).

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE	DATE RATE
A	0 to 78	0, 39, 78	FHSS	GFSK	DH5	1
A	0 to 78	0, 39, 78	FHSS	8DPSK	DH5	3

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.

3.2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together without any necessary accessory or support unit.

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 DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 04, 2009	May 03, 2010
HP Preamplifier	8449B	3008A01924	Sep. 03, 2008	Sep. 02, 2009
HP Preamplifier	8449B	3008A01292	Aug. 06, 2008	Aug. 05, 2009
ROHDE & SCHWARZ TEST RECEIVER	ESI7	836697/012	Dec. 04, 2008	Dec. 03, 2009
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2009	Apr. 28, 2010
Schwarzbeck Antenna	VHBA 9123	480	Apr. 21, 2009	Apr. 20, 2010
EMCO Horn Antenna	3115	6714	Oct. 17, 2008	Oct. 16, 2009
EMCO Horn Antenna	3115	9312-4192	Apr. 17, 2009	Apr. 16, 2010
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF104-26.5	CABLE-CH6-17 m-01	Aug. 22, 2008	Aug. 21, 2009
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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 horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

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.

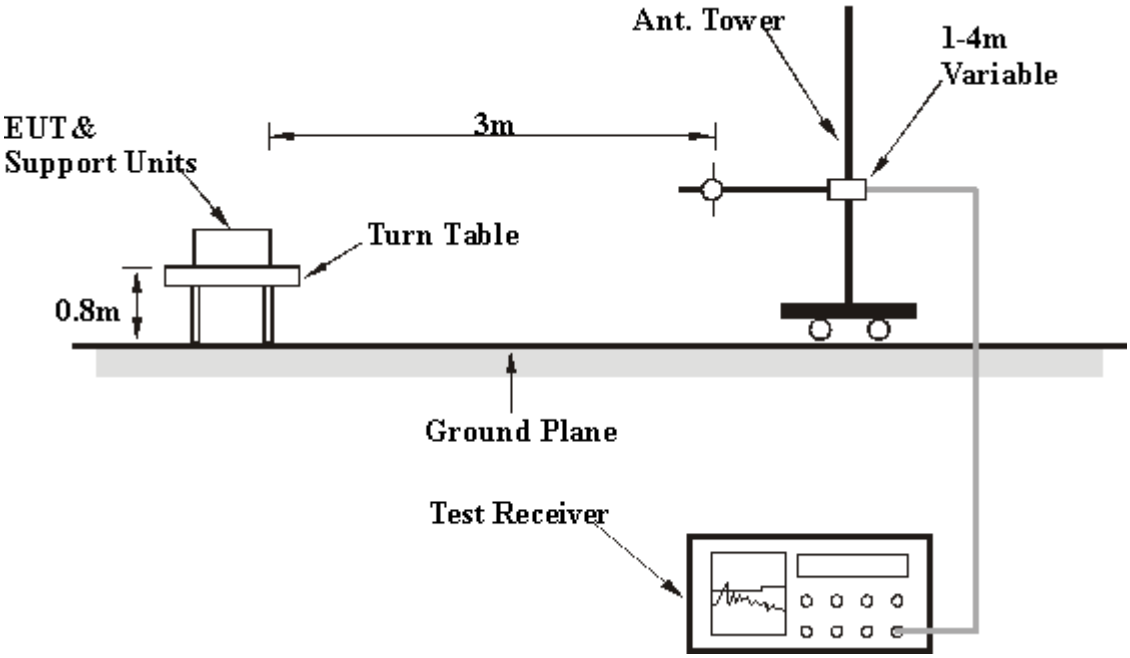
NOTE:

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

For Mode A:

a. Connected the EUT with AC adapter placed on testing table.

b. Set the EUT under transmission/receiving condition continuously at specific channel frequency.

For Mode B:

Set the EUT under transmission/receiving condition continuously at specific channel frequency.

4.2.7 TEST RESULTS

GFSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1602.00	42.18 PK	74.00	-31.82	1.00 H	195	10.26	31.92
2	1602.00	29.41 AV	54.00	-24.59	1.00 H	195	-2.51	31.92
3	2390.00	58.88 PK	74.00	-15.12	1.00 H	333	23.81	35.07
4	2390.00	47.05 AV	54.00	-6.95	1.00 H	333	11.98	35.07
5	#2400.00	70.14 PK	89.24	-19.10	1.00 H	333	35.05	35.09
6	#2400.00	40.04 AV	59.14	-19.10	1.00 H	333	4.95	35.09
7	*2402.00	109.24 PK			1.00 H	333	74.15	35.09
8	*2402.00	79.14 AV			1.00 H	333	44.05	35.09
9	4804.00	56.12 PK	74.00	-17.88	1.12 H	323	13.13	42.99
10	4804.00	26.02 AV	54.00	-27.98	1.12 H	323	-16.97	42.99

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1602.00	42.74 PK	74.00	-31.26	1.00 V	278	10.82	31.92
2	1602.00	28.93 AV	54.00	-25.07	1.00 V	278	-2.99	31.92
3	2390.00	59.61 PK	74.00	-14.39	1.00 V	264	24.54	35.07
4	2390.00	46.87 AV	54.00	-7.13	1.00 V	264	11.80	35.07
5	#2400.00	62.67 PK	81.77	-19.10	1.00 V	264	27.58	35.09
6	#2400.00	32.57 AV	51.67	-19.10	1.00 V	264	-2.52	35.09
7	*2402.00	101.77 PK			1.00 V	264	66.68	35.09
8	*2402.00	71.67 AV			1.00 V	264	36.58	35.09
9	4804.00	58.94 PK	74.00	-15.06	1.00 V	155	15.95	42.99
10	4804.00	28.84 AV	54.00	-25.16	1.00 V	155	-14.15	42.99

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1626.00	42.56 PK	74.00	-31.44	1.00 H	178	10.53	32.03
2	1626.00	29.74 AV	54.00	-24.26	1.00 H	178	-2.29	32.03
3	*2441.00	108.60 PK			1.06 H	291	73.43	35.17
4	*2441.00	78.50 AV			1.06 H	291	43.33	35.17
5	4882.00	57.82 PK	74.00	-16.18	1.00 H	159	14.68	43.14
6	4882.00	27.72 AV	54.00	-26.28	1.00 H	159	-15.42	43.14
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	1626.00	42.86 PK	74.00	-31.14	1.00 V	121	10.83	32.03
2	1626.00	29.73 AV	54.00	-24.27	1.00 V	121	-2.30	32.03
3	*2441.00	100.49 PK			1.00 V	289	65.32	35.17
4	*2441.00	70.39 AV			1.00 V	289	35.22	35.17
5	4882.00	59.85 PK	74.00	-14.15	1.00 V	157	16.71	43.14
6	4882.00	29.75 AV	54.00	-24.25	1.00 V	157	-13.39	43.14

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.
5. " * ": Fundamental frequency.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	#1652.00	43.27 PK	83.74	-40.47	1.00 H	124	11.12	32.15
2	#1652.00	29.83 AV	53.64	-23.81	1.00 H	124	-2.32	32.15
3	*2480.00	103.74 PK			1.00 H	297	68.49	35.25
4	*2480.00	73.64 AV			1.00 H	297	38.39	35.25
5	2483.50	47.83 PK	74.00	-26.17	1.00 H	297	12.57	35.26
6	2483.50	17.73 AV	54.00	-36.27	1.00 H	297	-17.53	35.26
7	4960.00	57.51 PK	74.00	-16.49	1.05 H	340	14.21	43.30
8	4960.00	27.41 AV	54.00	-26.59	1.05 H	340	-15.89	43.30
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	#1652.00	43.01 PK	79.36	-36.35	1.00 V	251	10.86	32.15
2	#1652.00	29.60 AV	49.26	-19.66	1.00 V	251	-2.55	32.15
3	*2480.00	99.36 PK			1.00 V	263	64.11	35.25
4	*2480.00	69.26 AV			1.00 V	263	34.01	35.25
5	2483.50	43.45 PK	74.00	-30.55	1.00 V	263	8.19	35.26
6	2483.50	13.35 AV	54.00	-40.65	1.00 V	263	-21.91	35.26
7	4960.00	58.04 PK	74.00	-15.96	1.02 V	262	14.74	43.30
8	4960.00	27.94 AV	54.00	-26.06	1.02 V	262	-15.36	43.30

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

8DPSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1602.00	40.31 PK	74.00	-33.69	1.00 H	257	8.39	31.92
2	1602.00	28.96 AV	54.00	-25.04	1.00 H	257	-2.96	31.92
3	2390.00	60.36 PK	74.00	-13.64	1.00 H	20	25.29	35.07
4	**2390.00**	**48.90 AV**	**54.00**	**-5.10**	**1.00 H**	**20**	**13.83**	**35.07**
5	#2400.00	56.92 PK	87.78	-30.86	1.00 H	20	21.83	35.09
6	#2400.00	26.82 AV	57.68	-30.86	1.00 H	20	-8.27	35.09
7	*2402.00	107.78 PK			1.00 H	20	72.69	35.09
8	*2402.00	77.68 AV			1.00 H	20	42.59	35.09
9	4804.00	50.88 PK	74.00	-23.12	1.09 H	40	7.89	42.99
10	4804.00	20.78 AV	54.00	-33.22	1.09 H	40	-22.21	42.99

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1602.00	41.73 PK	74.00	-32.27	1.00 V	67	9.81	31.92
2	1602.00	29.26 AV	54.00	-24.74	1.00 V	67	-2.66	31.92
3	2390.00	60.07 PK	74.00	-13.93	1.00 V	265	25.00	35.07
4	2390.00	48.46 AV	54.00	-5.54	1.00 V	265	13.39	35.07
5	#2400.00	47.42 PK	78.28	-30.86	1.00 V	265	12.33	35.09
6	#2400.00	17.32 AV	48.18	-30.86	1.00 V	265	-17.77	35.09
7	*2402.00	98.28 PK			1.00 V	265	63.19	35.09
8	*2402.00	68.18 AV			1.00 V	265	33.09	35.09
9	4804.00	53.41 PK	74.00	-20.59	1.11 V	7	10.42	42.99
10	4804.00	23.31 AV	54.00	-30.69	1.11 V	7	-19.68	42.99

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	1626.00	43.29 PK	74.00	-30.71	1.00 H	286	11.26	32.03
2	1626.00	29.47 AV	54.00	-24.53	1.00 H	286	-2.56	32.03
3	*2441.00	106.72 PK			1.06 H	291	71.55	35.17
4	*2441.00	76.62 AV			1.06 H	291	41.45	35.17
5	4882.00	55.32 PK	74.00	-18.68	1.00 H	177	12.18	43.14
6	4882.00	25.22 AV	54.00	-28.78	1.00 H	177	-17.92	43.14
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	1626.00	41.50 PK	74.00	-32.50	1.00 V	88	9.47	32.03
2	1626.00	29.60 AV	54.00	-24.40	1.00 V	88	-2.43	32.03
3	*2441.00	102.69 PK			1.00 V	264	67.52	35.17
4	*2441.00	72.59 AV			1.00 V	264	37.42	35.17
5	4882.00	56.77 PK	74.00	-17.23	1.00 V	320	13.63	43.14
6	4882.00	26.67 AV	54.00	-27.33	1.00 V	320	-16.47	43.14

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.
5. " * ": Fundamental frequency.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 78% RH 1006hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	#1654.00	43.15 PK	85.43	-42.28	1.00 H	55	10.99	32.16
2	#1654.00	30.31 AV	55.33	-25.02	1.00 H	55	-1.85	32.16
3	*2480.00	105.43 PK			1.03 H	291	70.18	35.25
4	*2480.00	75.33 AV			1.03 H	291	40.08	35.25
5	2483.50	54.95 PK	74.00	-19.05	1.03 H	291	19.69	35.26
6	2483.50	24.85 AV	54.00	-29.15	1.03 H	291	-10.41	35.26
7	4960.00	55.70 PK	74.00	-18.30	1.03 H	336	12.40	43.30
8	4960.00	25.60 AV	54.00	-28.40	1.03 H	336	-17.70	43.30
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	#1654.00	43.34 PK	79.37	-36.03	1.00 V	270	11.18	32.16
2	#1654.00	30.47 AV	49.27	-18.80	1.00 V	270	-1.69	32.16
3	*2480.00	99.37 PK			1.00 V	273	64.12	35.25
4	*2480.00	69.27 AV			1.00 V	273	34.02	35.25
5	2483.50	48.89 PK	74.00	-25.11	1.00 V	273	13.63	35.26
6	2483.50	18.79 AV	54.00	-35.21	1.00 V	273	-16.47	35.26
7	4960.00	55.67 PK	74.00	-18.33	1.00 V	261	12.37	43.30
8	4960.00	25.57 AV	54.00	-28.43	1.00 V	261	-17.73	43.30

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.
6. 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 correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).
8. "#":The radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA：GFSK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 81% RH 1004hPa	TESTED BY	Nick Chen
TEST MODE	A		

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	37.78	29.67 QP	40.00	-10.33	1.07 H	10	16.77	12.90
2	655.93	31.12 QP	46.00	-14.88	1.10 H	97	6.99	24.13
3	669.54	31.23 QP	46.00	-14.77	1.03 H	97	6.89	24.34
4	690.92	27.66 QP	46.00	-18.34	1.24 H	97	2.99	24.67
5	898.92	26.02 QP	46.00	-19.98	1.21 H	187	-2.01	28.03
6	953.35	26.35 QP	46.00	-19.65	1.10 H	208	-2.28	28.63
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	33.89	33.27 QP	40.00	-6.73	1.02 V	7	21.01	12.26
2	64.99	19.72 QP	40.00	-20.28	1.11 V	349	7.21	12.51
3	817.28	24.96 QP	46.00	-21.04	1.08 V	307	-1.92	26.88
4	858.10	25.77 QP	46.00	-20.23	1.03 V	10	-1.73	27.50
5	891.14	25.87 QP	46.00	-20.13	1.21 V	193	-2.06	27.93
6	930.02	26.12 QP	46.00	-19.88	1.08 V	229	-2.25	28.37
7	945.57	26.25 QP	46.00	-19.75	1.24 V	229	-2.29	28.54

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 81% RH 1004hPa	TESTED BY	Nick Chen
TEST MODE	B		

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	68.88	21.21 QP	40.00	-18.79	1.11 H	10	8.96	12.25
2	834.77	25.66 QP	46.00	-20.34	1.24 H	7	-1.50	27.16
3	865.87	24.67 QP	46.00	-21.33	1.21 H	160	-2.93	27.60
4	883.37	25.71 QP	46.00	-20.29	1.05 H	115	-2.12	27.83
5	928.08	25.40 QP	46.00	-20.60	1.00 H	178	-2.95	28.35
6	957.23	26.43 QP	46.00	-19.57	1.02 H	232	-2.24	28.67
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	63.05	19.81 QP	40.00	-20.19	1.01 V	211	7.18	12.63
2	836.71	25.36 QP	46.00	-20.64	1.20 V	130	-1.83	27.19
3	867.82	24.40 QP	46.00	-21.60	1.07 V	340	-3.23	27.63
4	891.14	26.43 QP	46.00	-19.57	1.13 V	10	-1.50	27.93
5	930.02	26.60 QP	46.00	-19.40	1.17 V	46	-1.77	28.37
6	951.40	26.15 QP	46.00	-19.85	1.20 V	202	-2.46	28.61

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.

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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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.

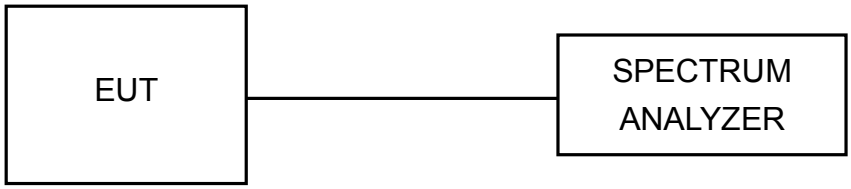
d. Set the SA on View mode and then plot the result on SA screen.

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

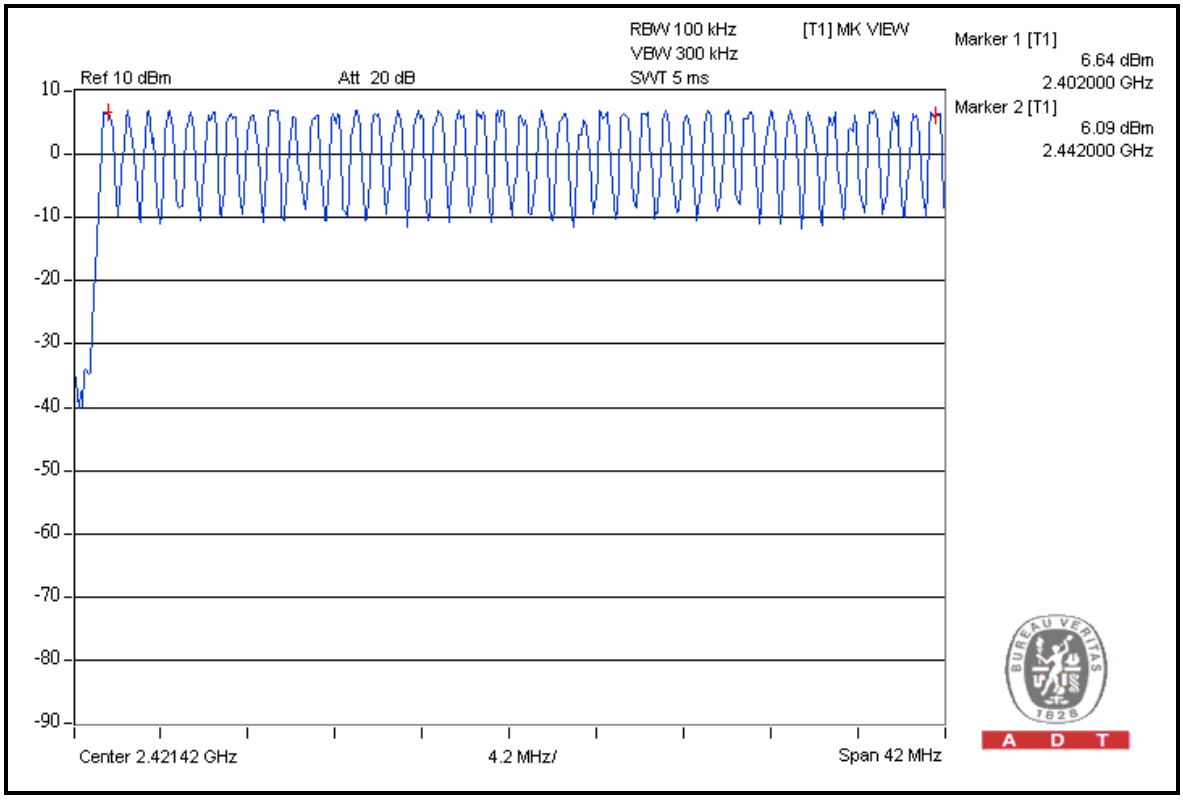
4.3.5 TEST SETUP

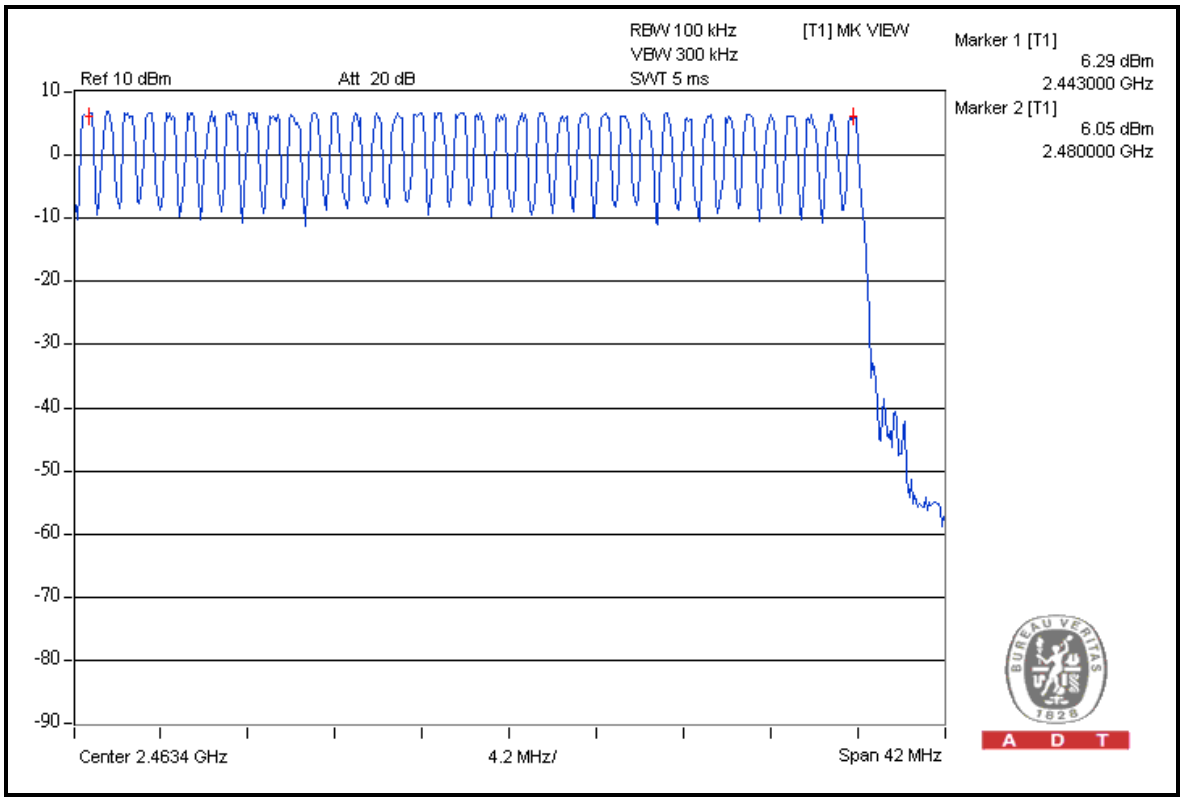


4.3.6 TEST RESULTS

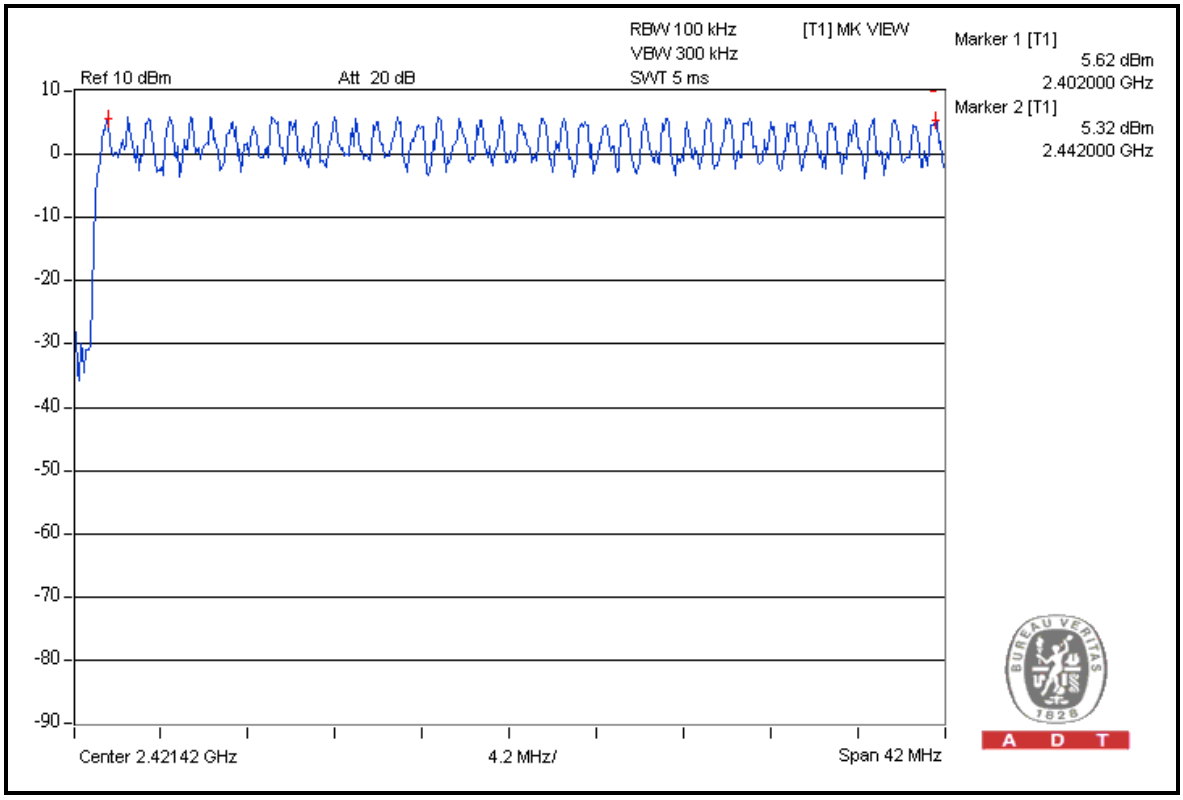
There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

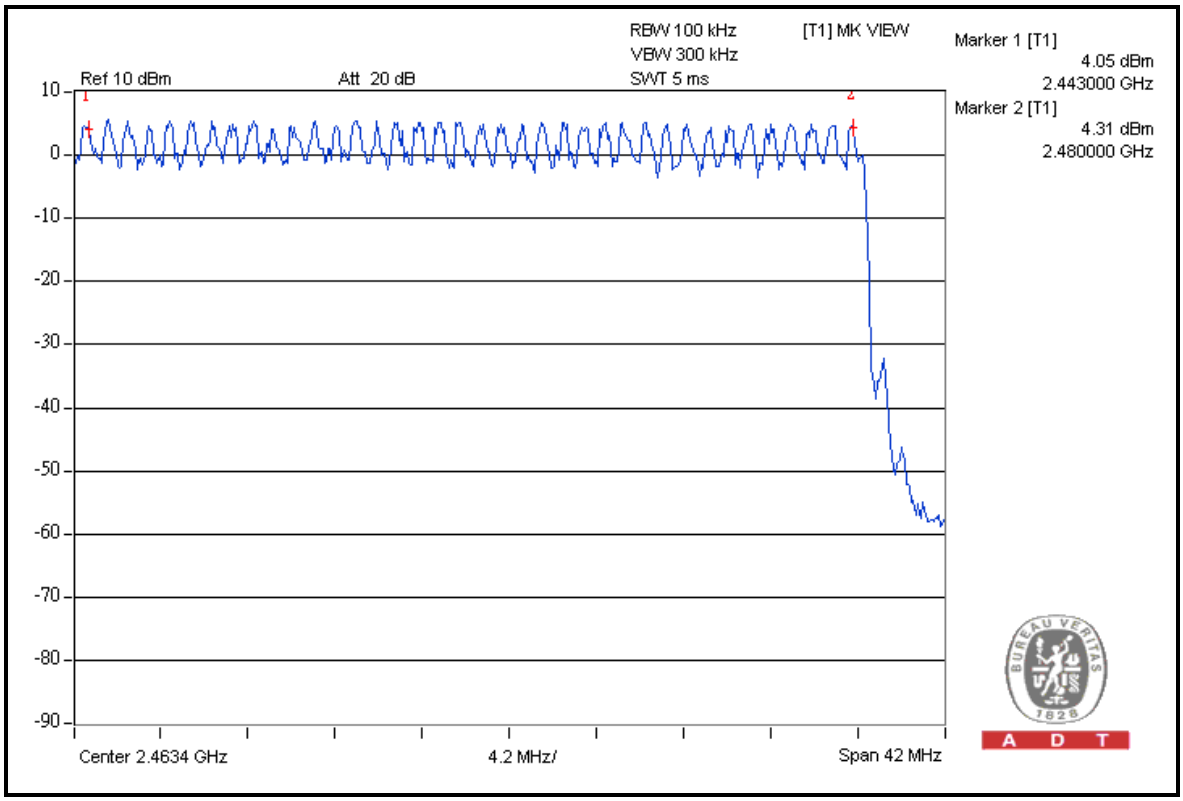
Mode A: FOR GFSK





Mode A: FOR 8DPSK





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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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

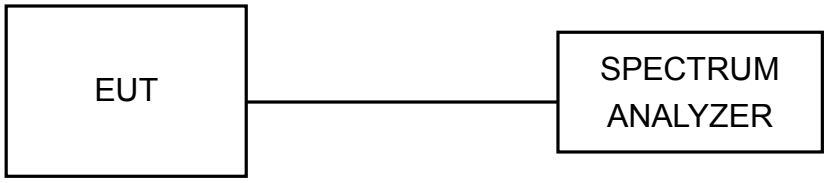
4.4.3 TEST PROCEDURES

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



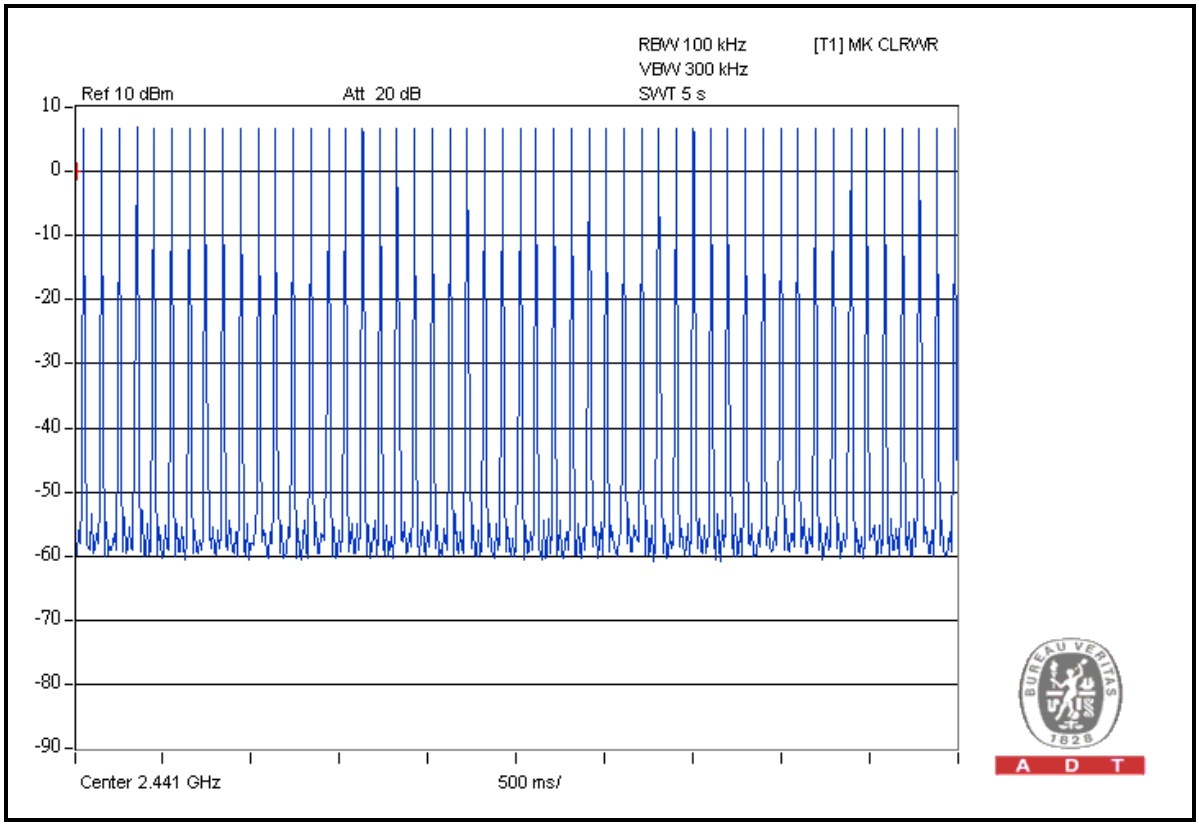
4.4.6 TEST RESULTS

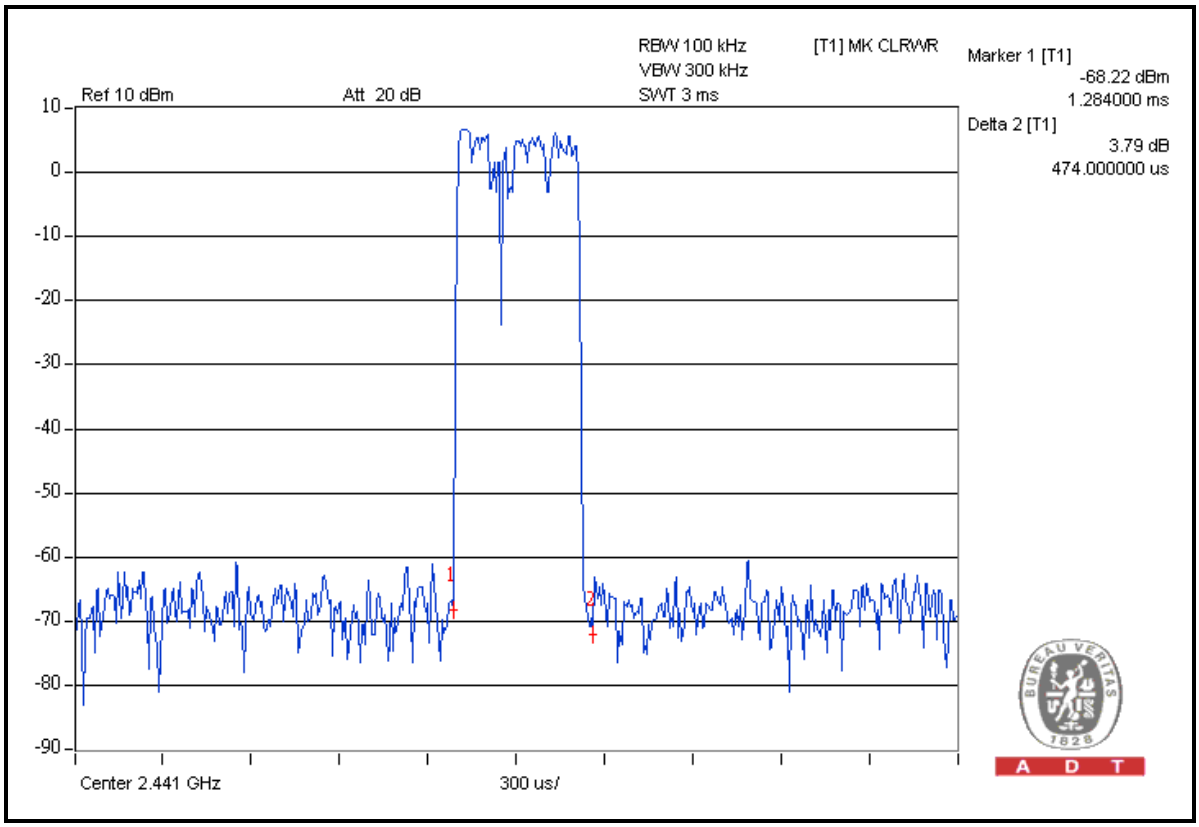
Mode A: FOR GFSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec) *6.32=322.32 times	0.474	152.77968	400
DH3	25 (times / 5 sec) *6.32=158.00 times	1.734	273.97200	400
DH5	16 (times / 5 sec) *6.32=101.12 times	3.010	304.37120	400

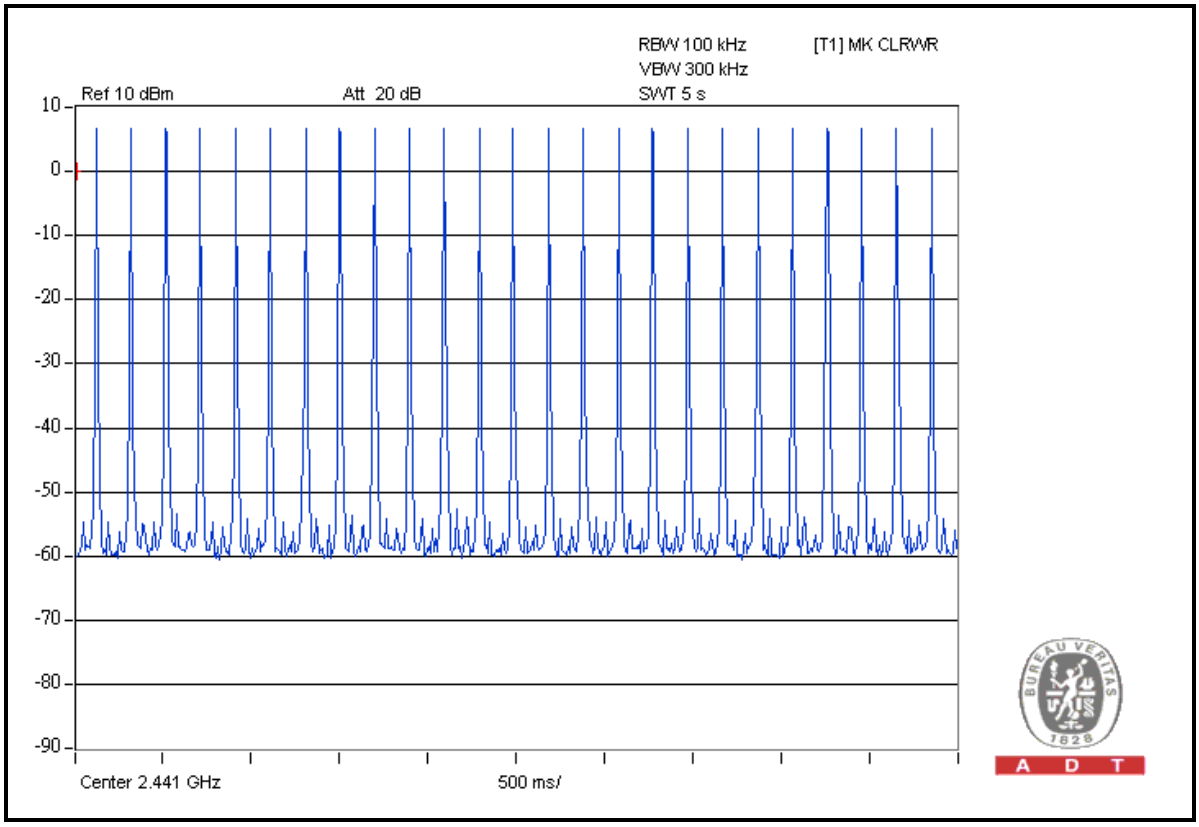
NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

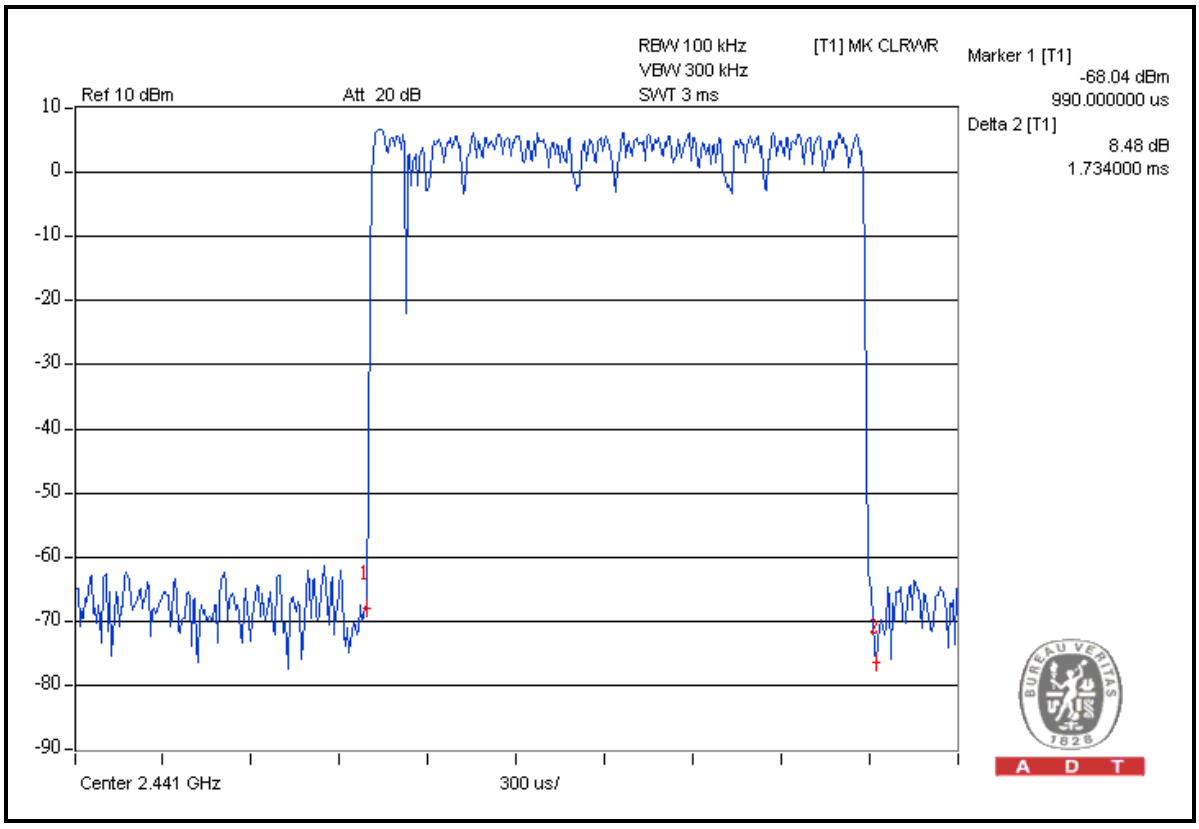
DH1


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/

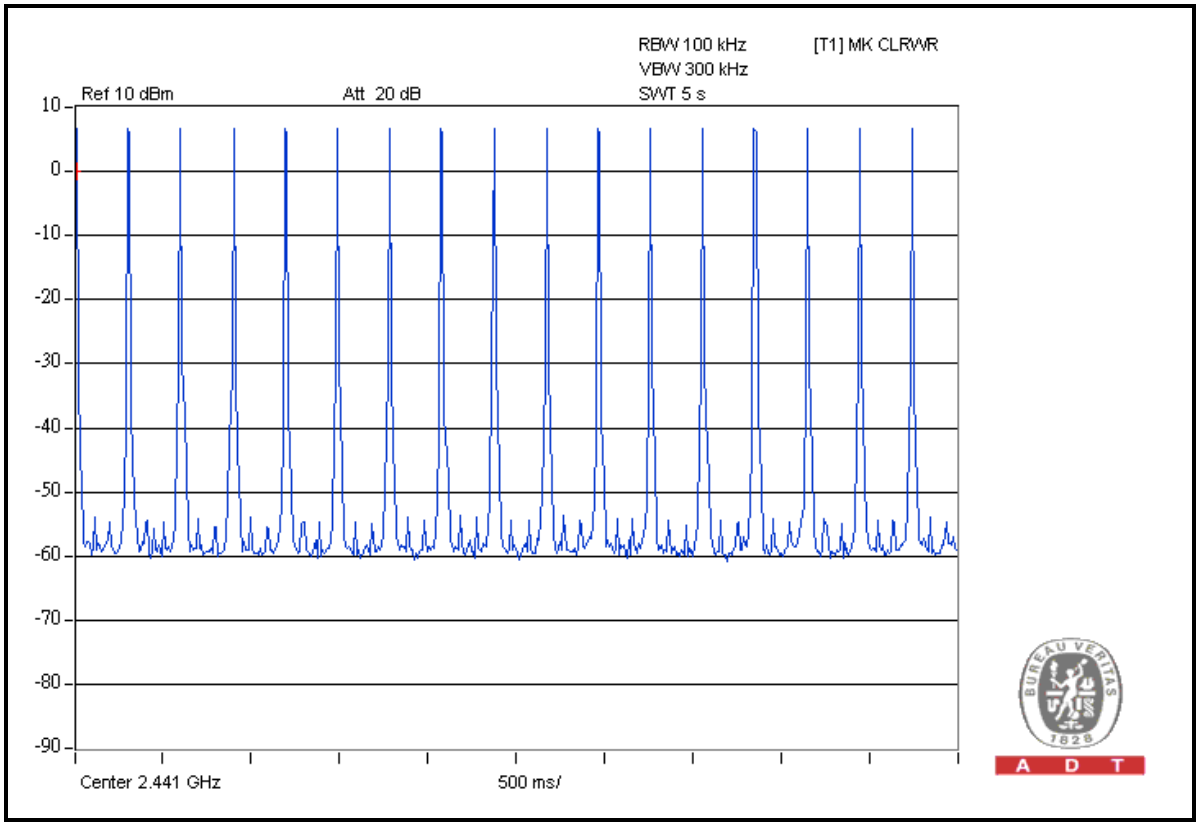

RBW 100 kHz
VBW 300 kHz
SWT 3 ms
[T1] MK CLRWR
Marker 1 [T1]
-68.22 dBm
1.284000 ms
Delta 2 [T1]
3.79 dB
474.000000 us
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
300 us/

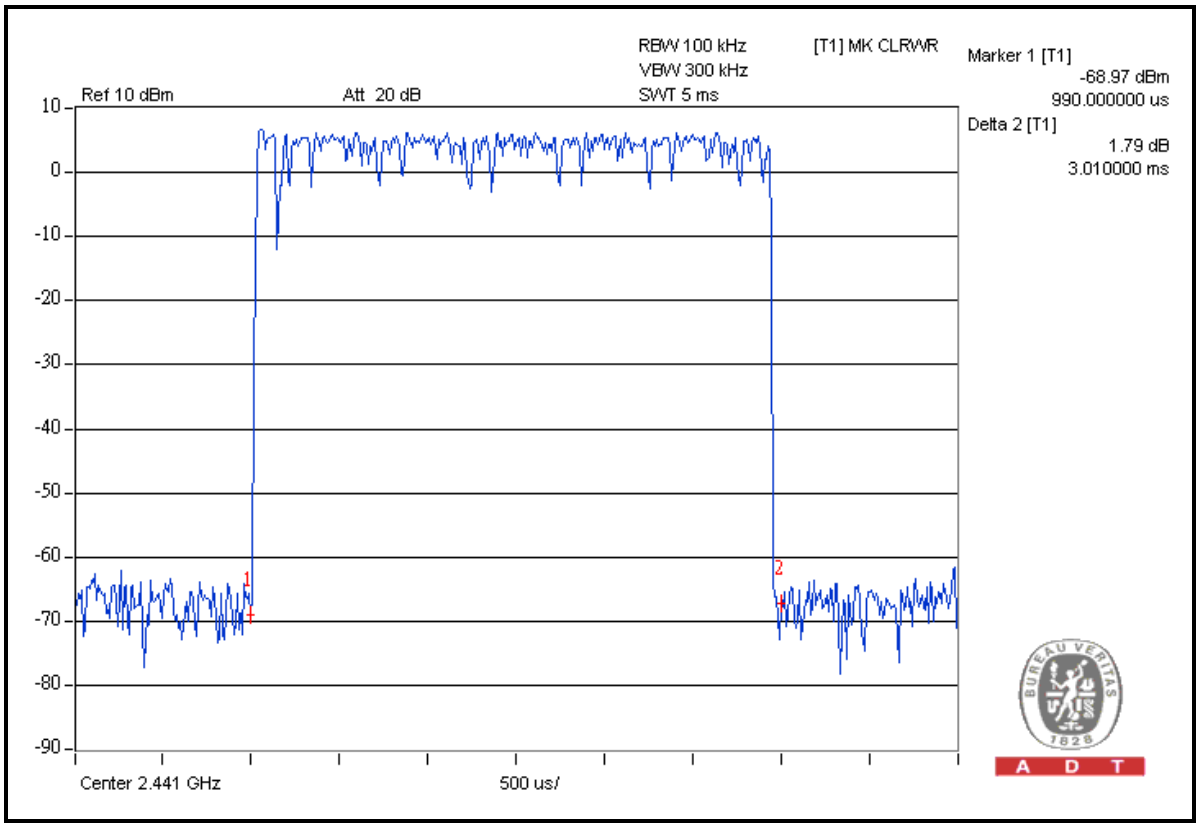
DH3


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 300 kHz
SWT 3 ms
[T1] MK CLRWR
Marker 1 [T1]
-68.04 dBm
990.000000 us
Delta 2 [T1]
8.48 dB
1.734000 ms
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
300 us/

DH5


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/

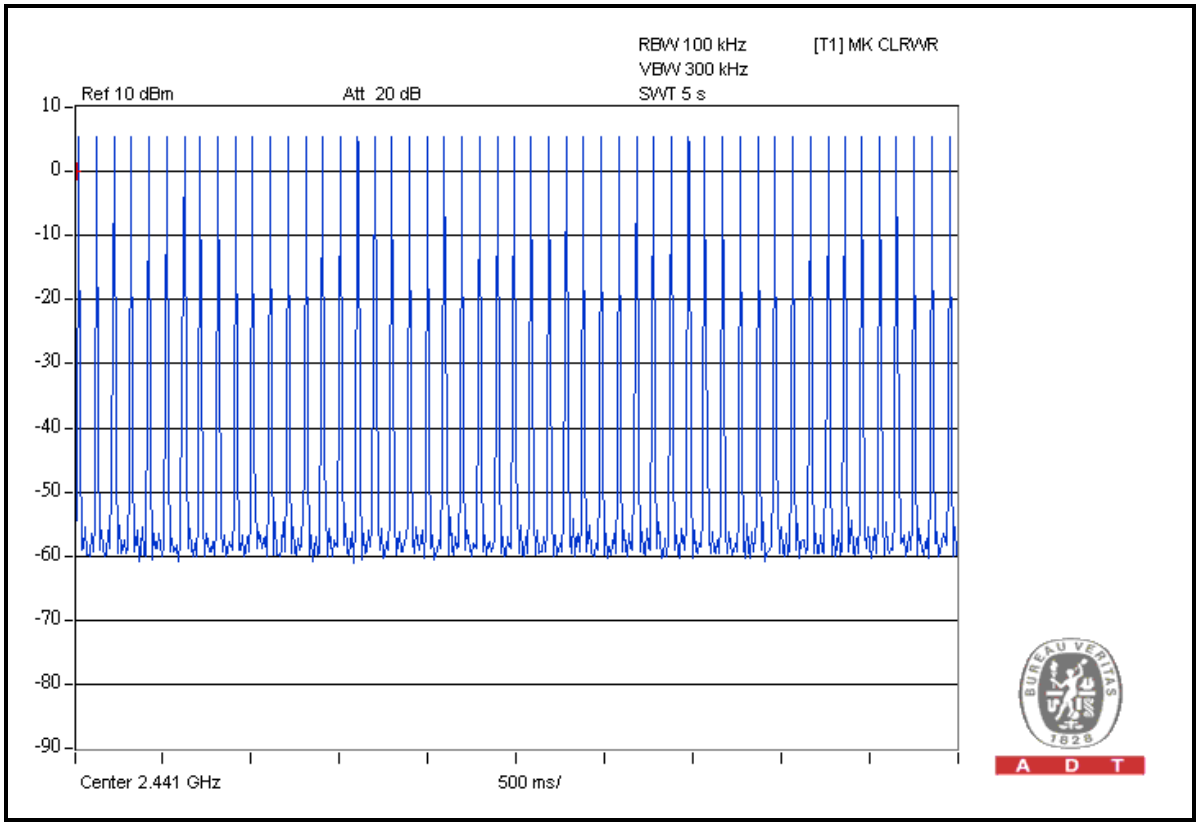

RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK CLRWR
Marker 1 [T1]
-68.97 dBm
990.000000 us
Delta 2 [T1]
1.79 dB
3.010000 ms
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 us/

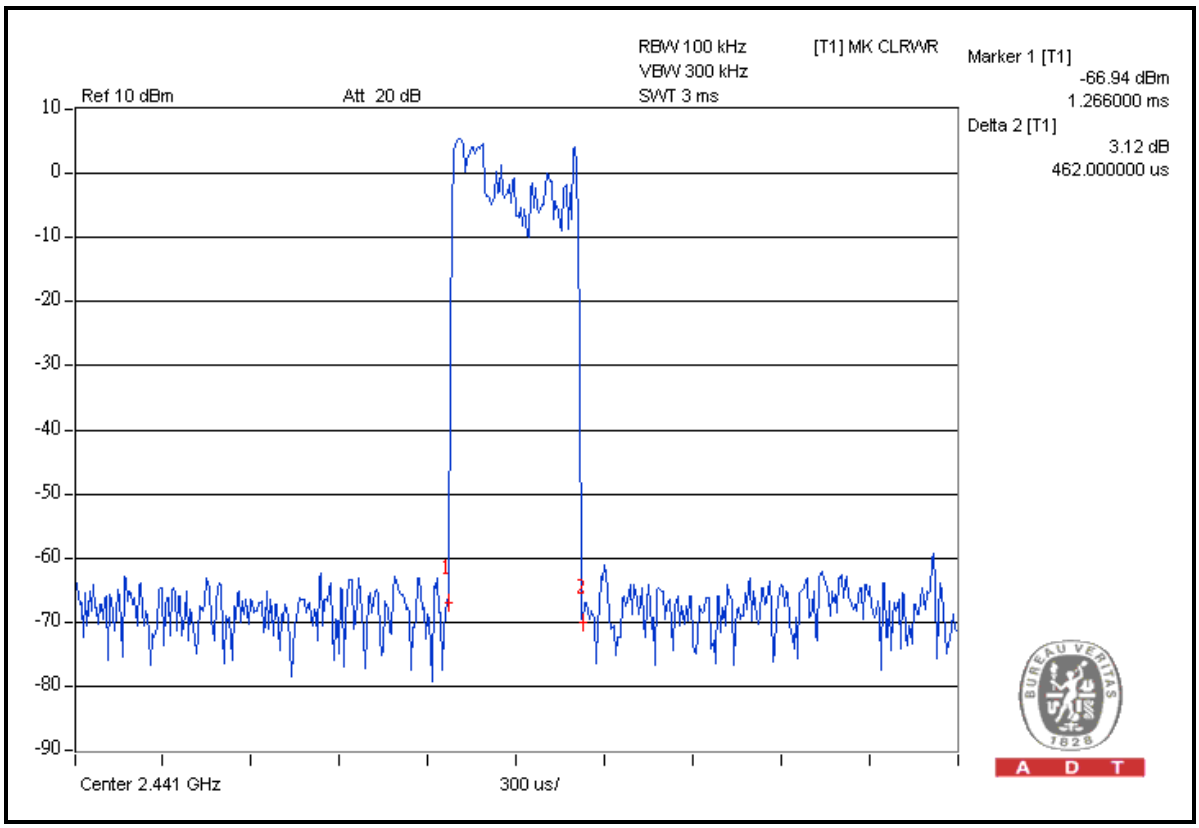
Mode A: FOR 8DPSK

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec) *6.32=322.32 times	0.462	148.91184	400
DH3	25 (times / 5 sec) *6.32=158.00 times	1.728	273.02400	400
DH5	17 (times / 5 sec) *6.32=107.44 times	2.980	320.17120	400

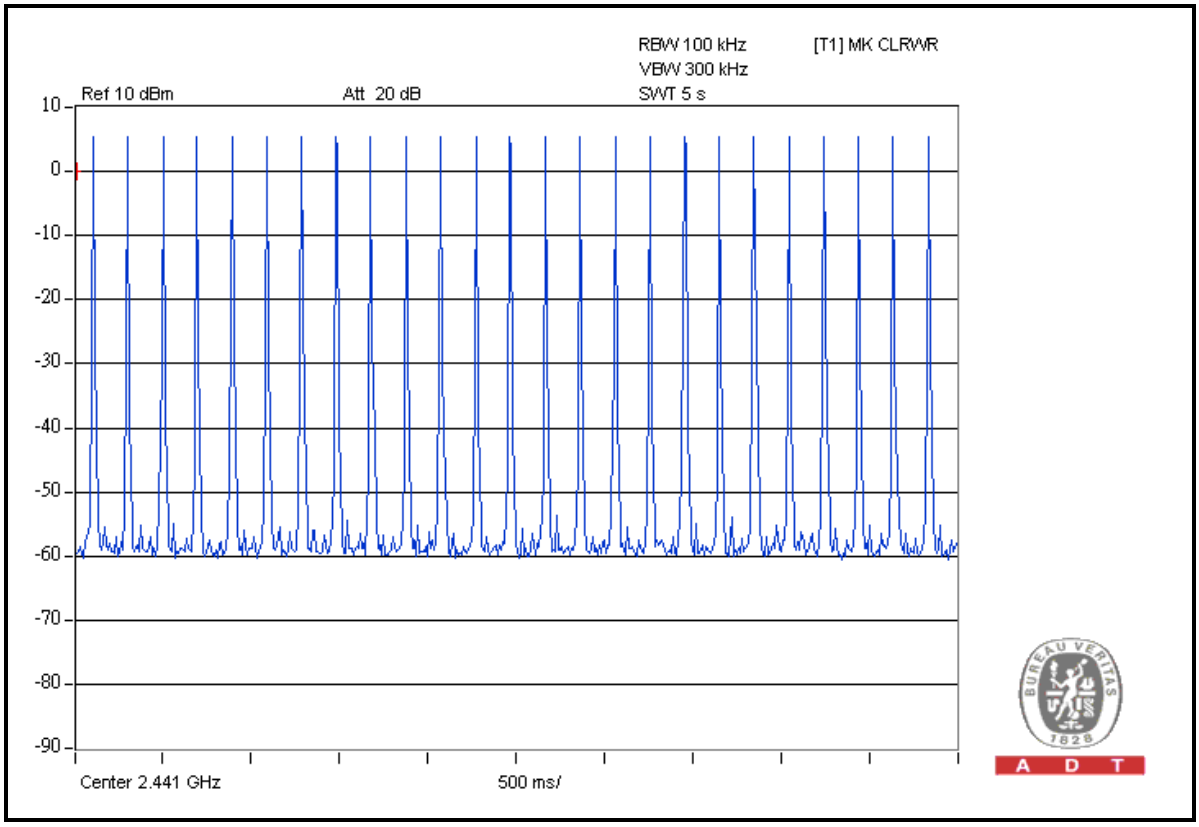
NOTE: Test plots of the transmitting time slot are shown on next 3 pages.

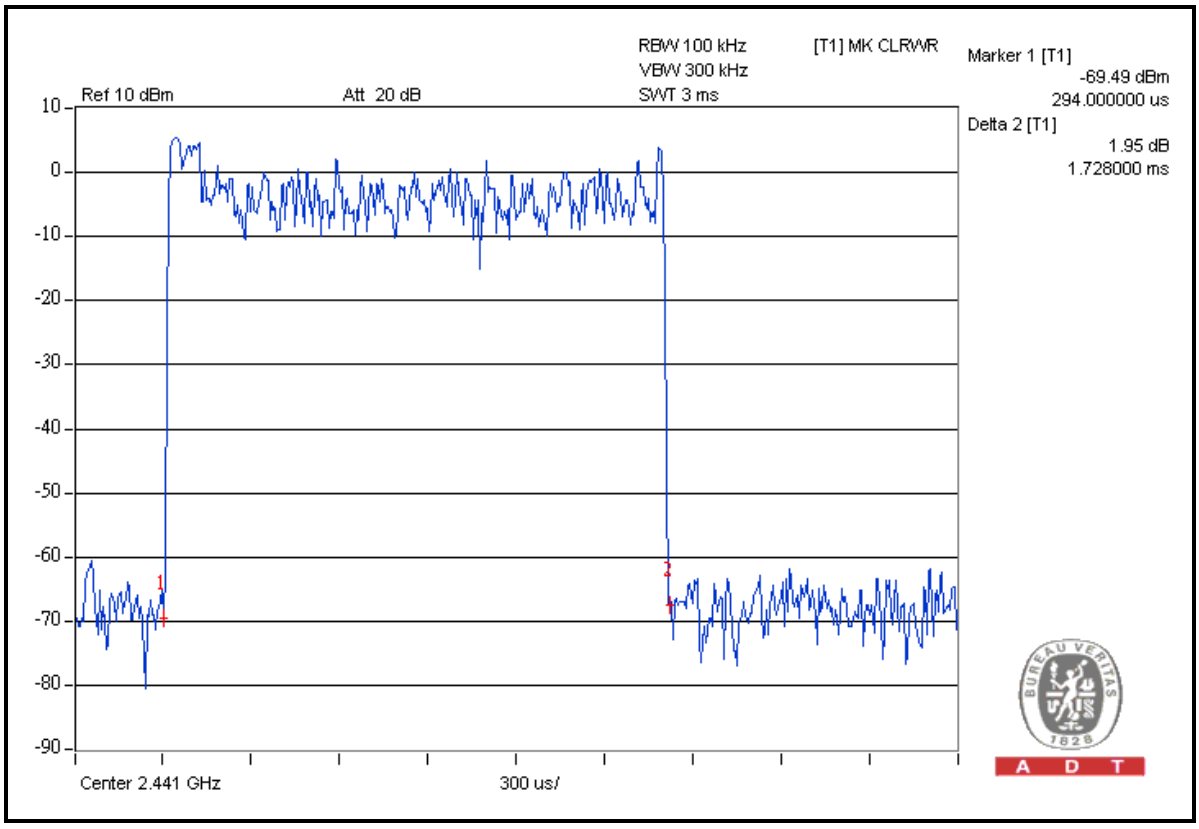
DH1


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/

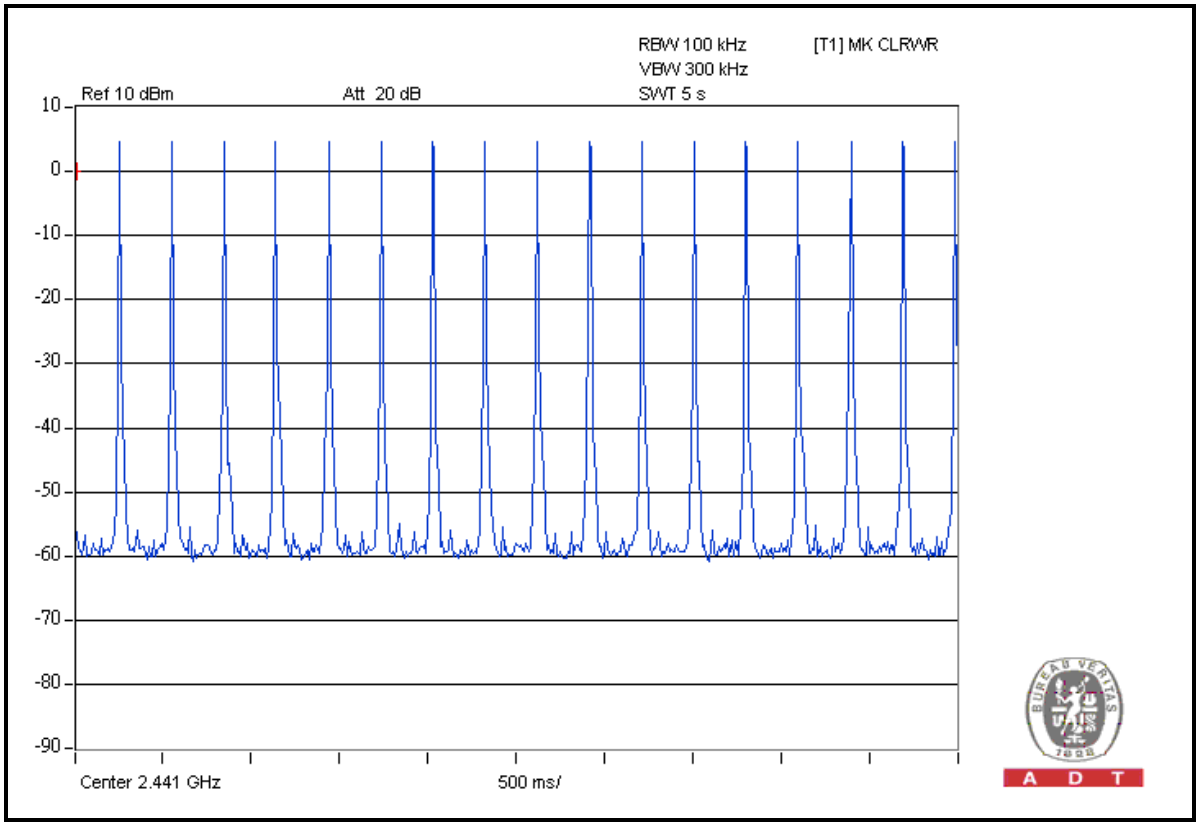

RBW 100 kHz
VBW 300 kHz
SWT 3 ms
[T1] MK CLRWR
Marker 1 [T1]
-66.94 dBm
1.266000 ms
Delta 2 [T1]
3.12 dB
462.000000 us
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
300 us/

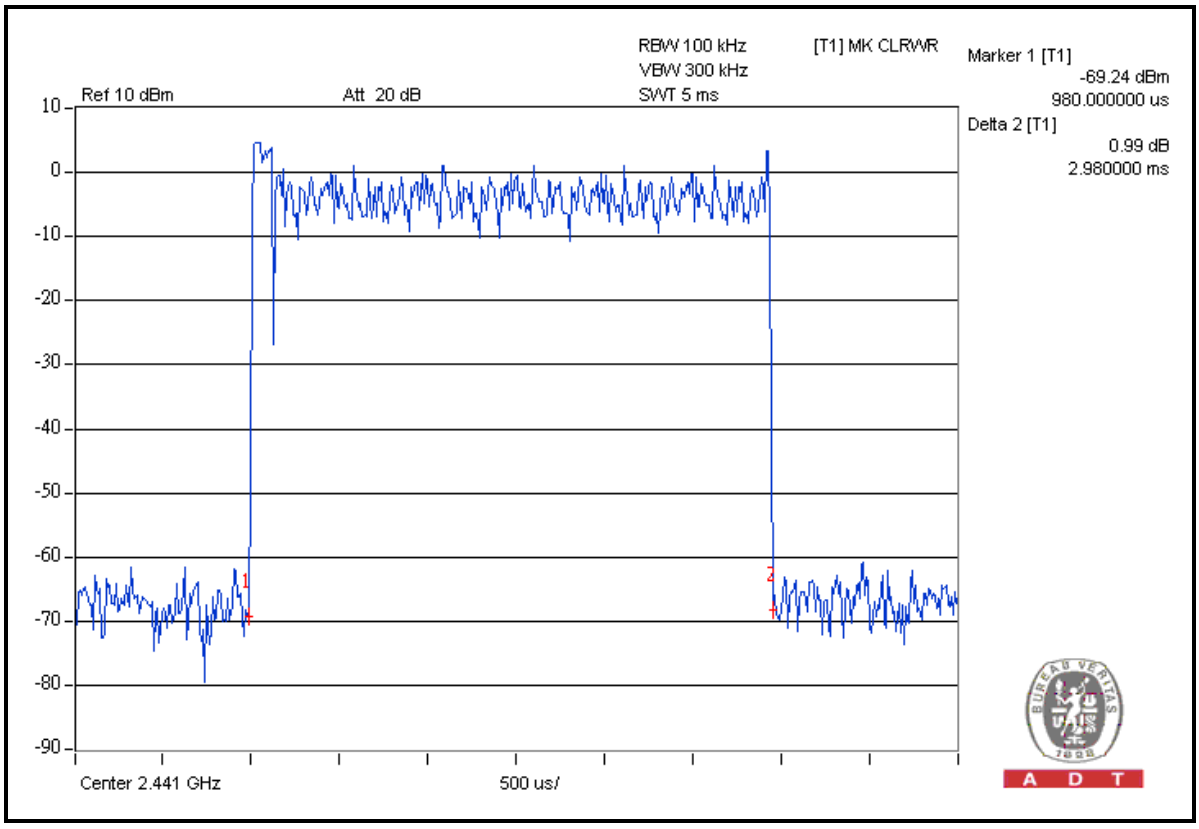
DH3


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 300 kHz
SWT 3 ms
[T1] MK CLRWR
Marker 1 [T1]
-69.49 dBm
294.000000 us
Delta 2 [T1]
1.95 dB
1.728000 ms
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
300 us/

DH5


RBW 100 kHz
VBW 300 kHz
SWT 5 s
[T1] MK CLRWR
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK CLRWR
Marker 1 [T1]
-69.24 dBm
980.000000 us
Delta 2 [T1]
0.99 dB
2.980000 ms
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 us/

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 20dBbandwidth 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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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.

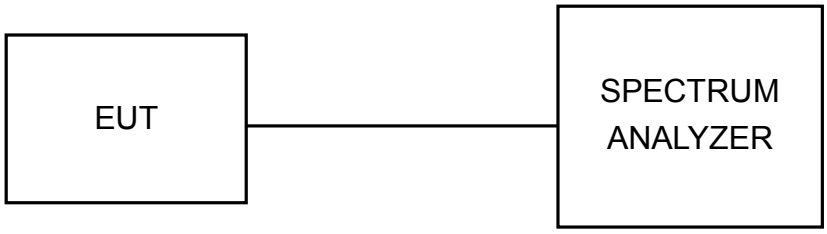
c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.

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.

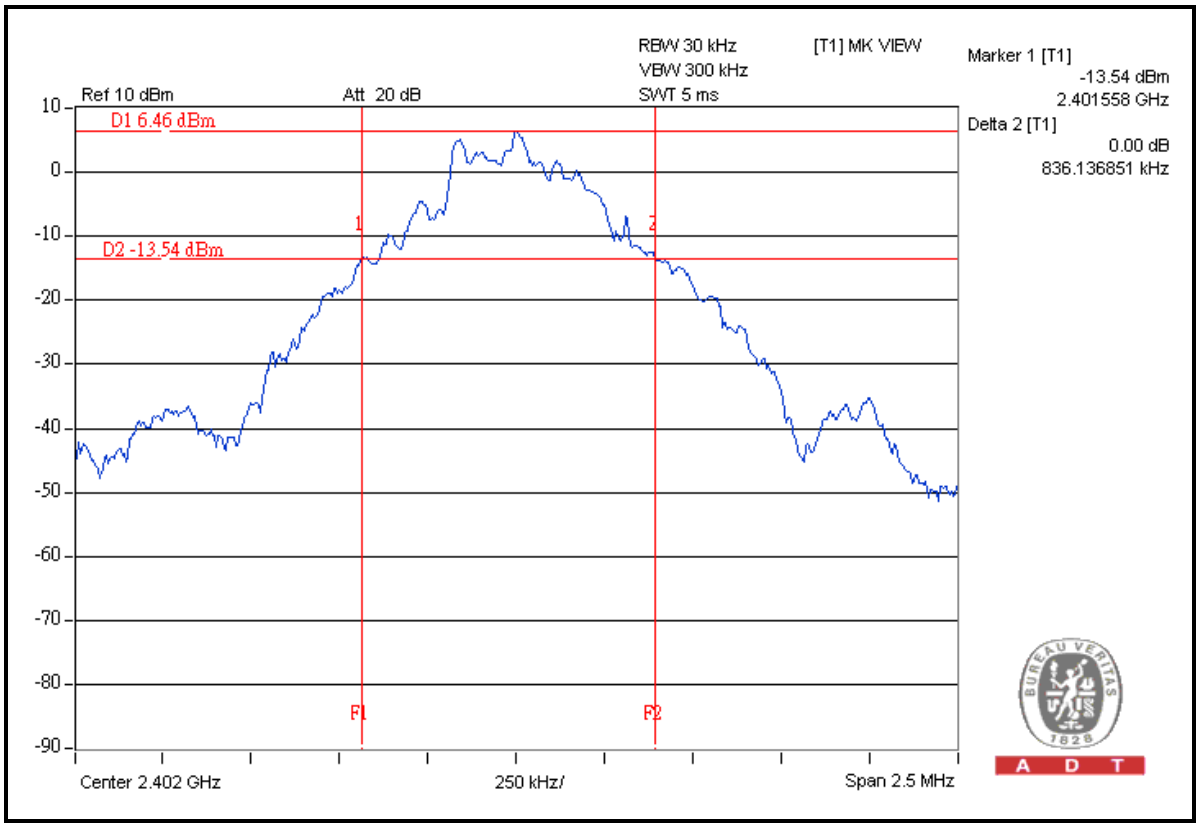
4.5.7 TEST RESULTS

FOR GFSK

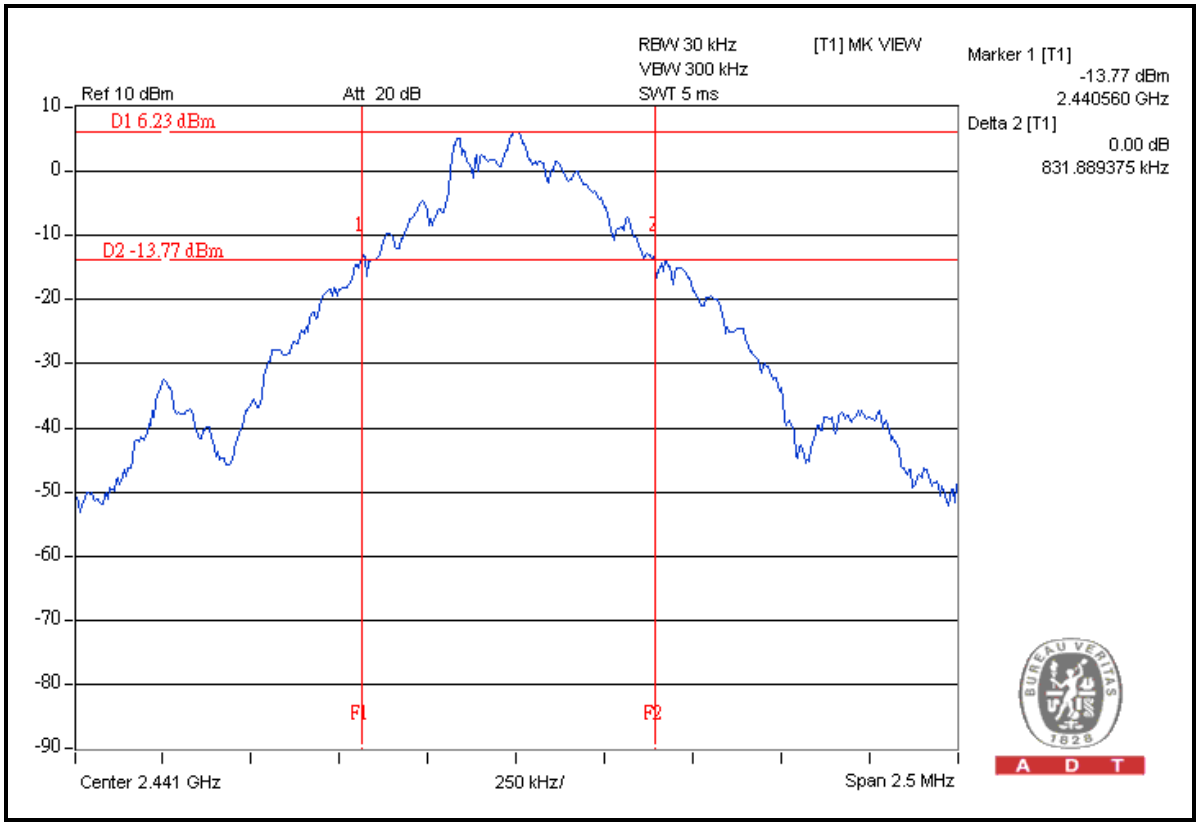
TEST MODE	A	CHANNEL	0, 39, 78
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21deg. C, 63% RH, 1004hPa
TESTED BY	Chad Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	0.836
39	2441	0.831
78	2480	0.842

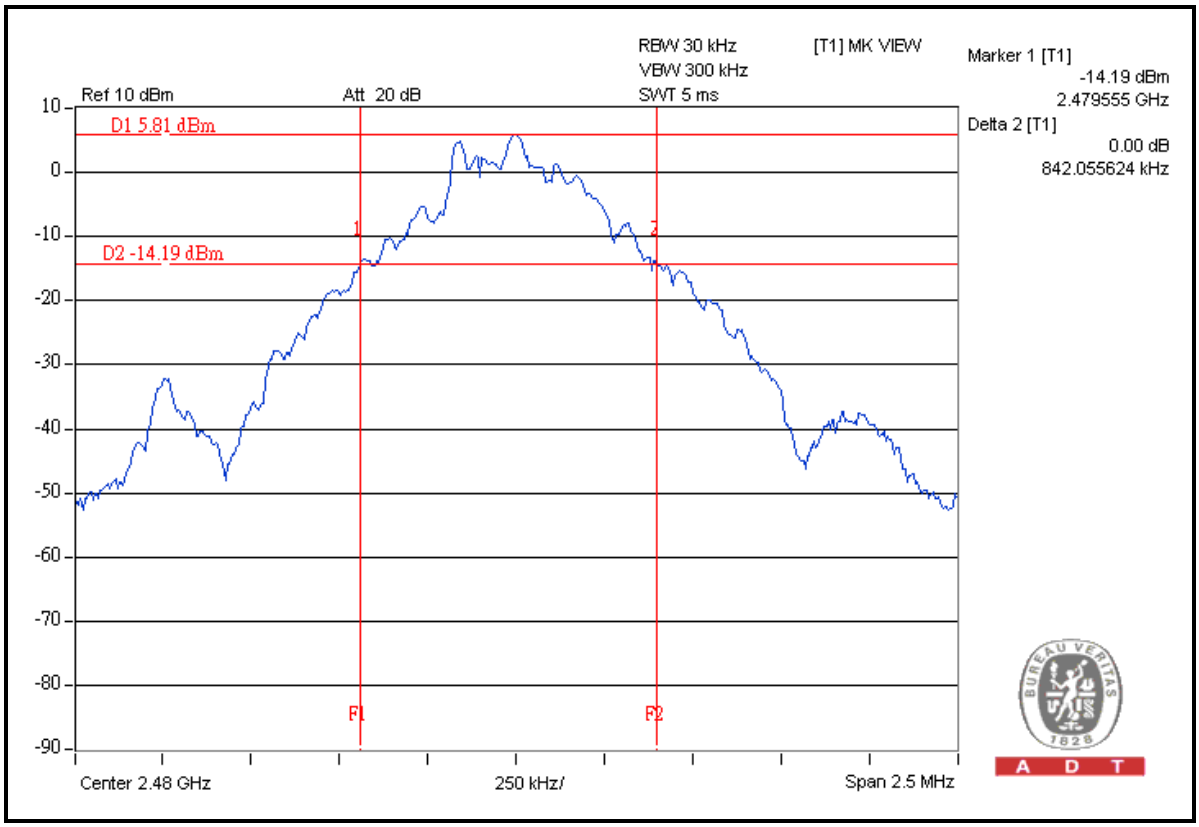
CH 0



CH 39


RBW 30 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-13.77 dBm
2.440560 GHz
Delta 2 [T1]
0.00 dB
831.889375 kHz
Ref 10 dBm
Att 20 dB
D1 6.23 dBm
D2 -13.77 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.441 GHz
250 kHz/
Span 2.5 MHz

CH 78

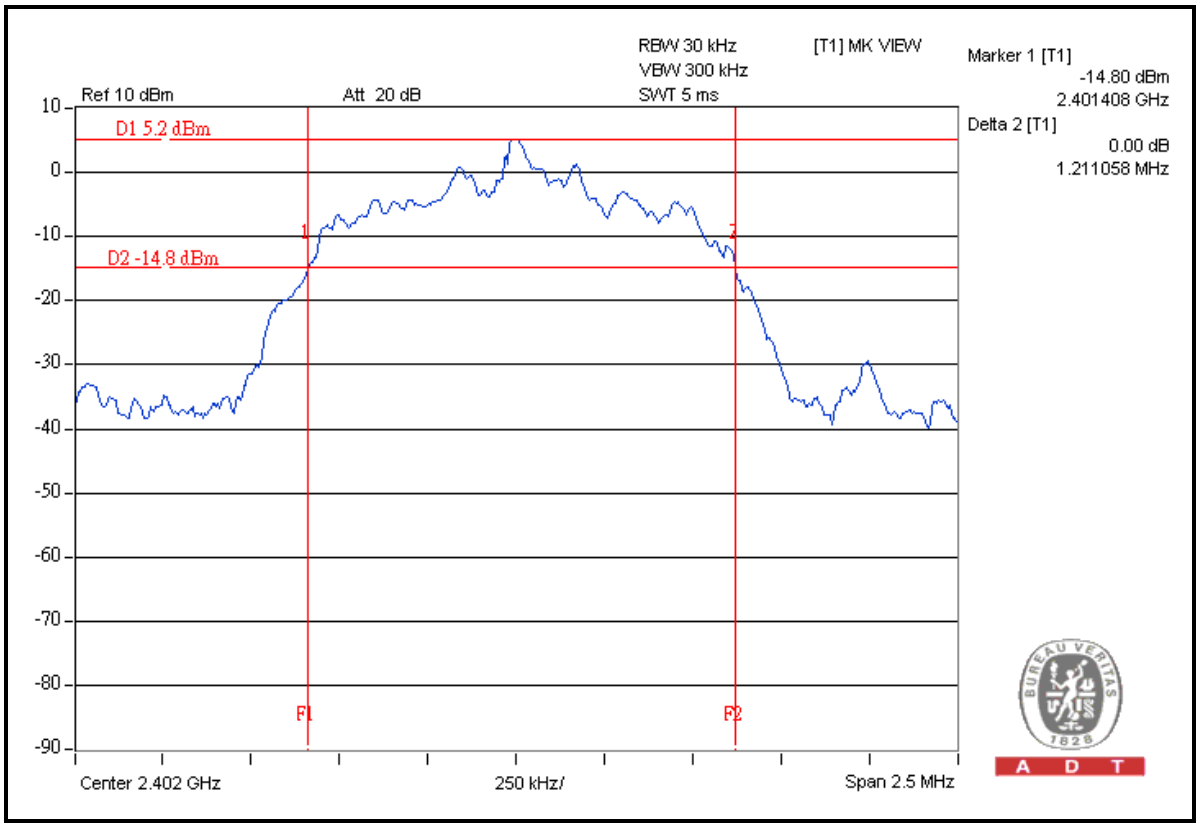

RBW 30 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-14.19 dBm
2.479555 GHz
Delta 2 [T1]
0.00 dB
842.055624 kHz
Ref 10 dBm
Att 20 dB
D1 5.81 dBm
D2 -14.19 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.48 GHz
250 kHz/
Span 2.5 MHz

FOR 8DPSK

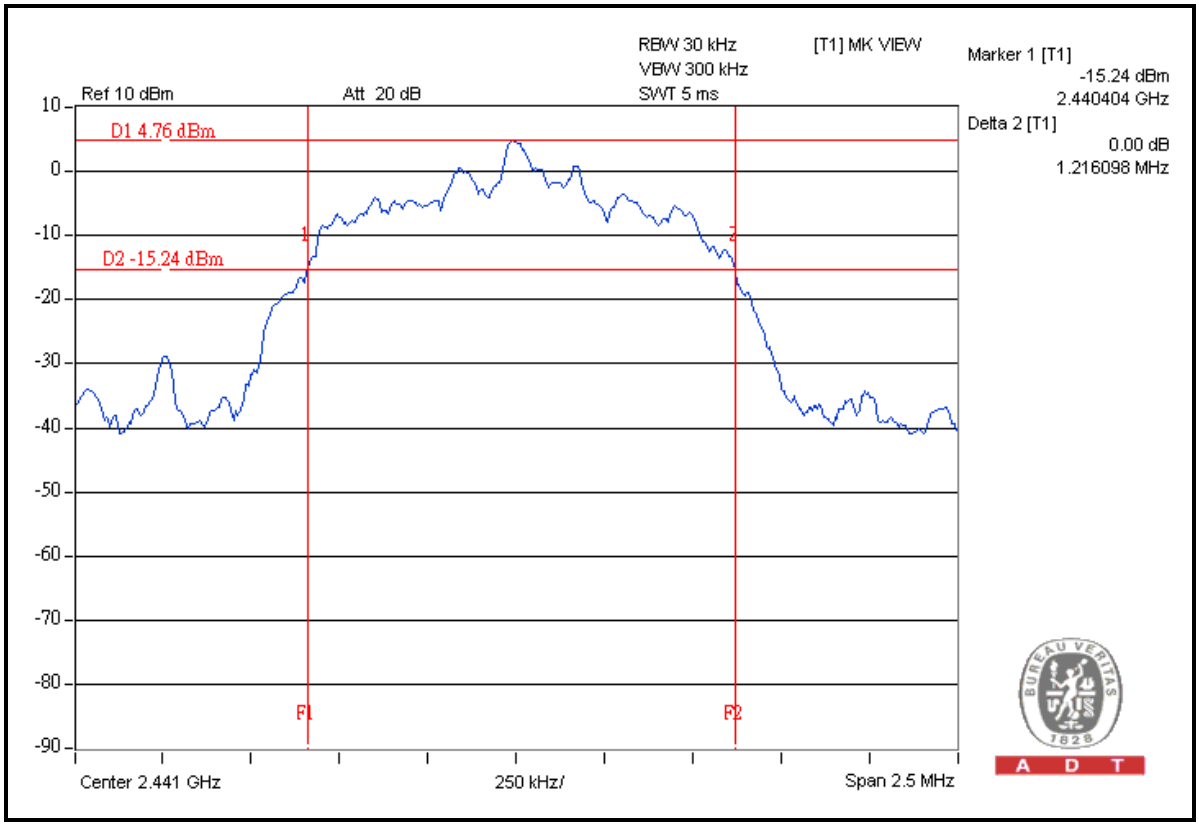
TEST MODE	A	CHANNEL	0, 39, 78
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21deg. C, 63% RH, 1004hPa
TESTED BY	Chad Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	1.211
39	2441	1.216
78	2480	1.213

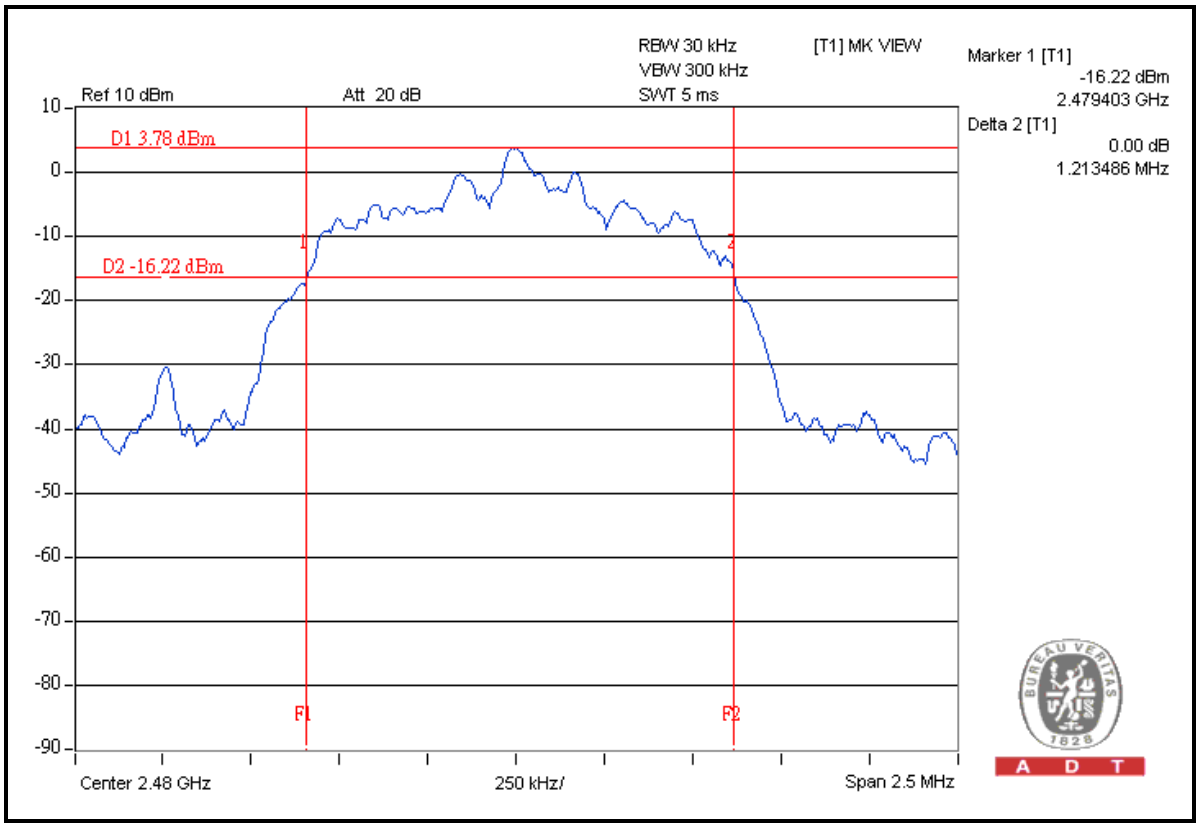
CH 0



CH 39


RBW 30 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-15.24 dBm
2.440404 GHz
Delta 2 [T1]
0.00 dB
1.216098 MHz
Ref 10 dBm
Att 20 dB
D1 4.76 dBm
D2 -15.24 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.441 GHz
250 kHz/
Span 2.5 MHz

CH 78


RBW 30 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-16.22 dBm
2.479403 GHz
Delta 2 [T1]
0.00 dB
1.213486 MHz
Ref 10 dBm
Att 20 dB
D1 3.78 dBm
D2 -16.22 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.48 GHz
250 kHz/
Span 2.5 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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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

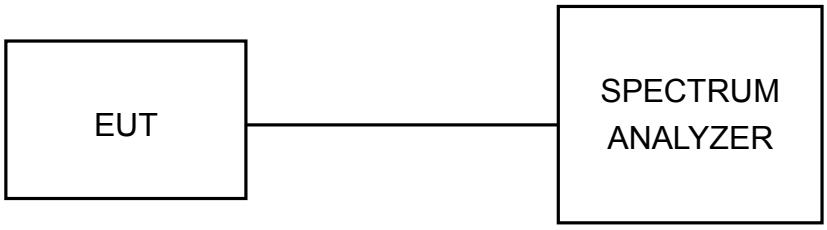
4.6.3 TEST PROCEDURES

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

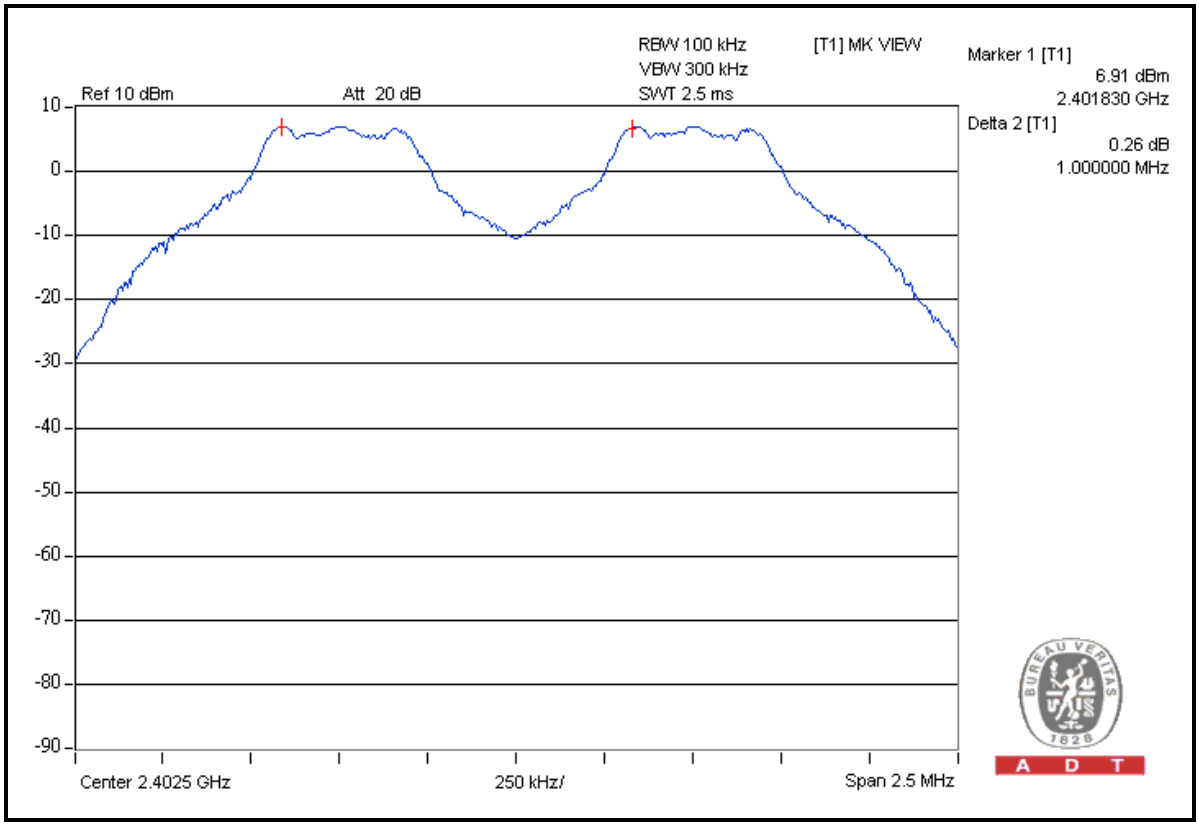
FOR GFSK

TEST MODE	A	**CHANNEL**	0, 39, 78
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	21deg. C, 63% RH, 1004hPa
TESTED BY	Chad Lee		

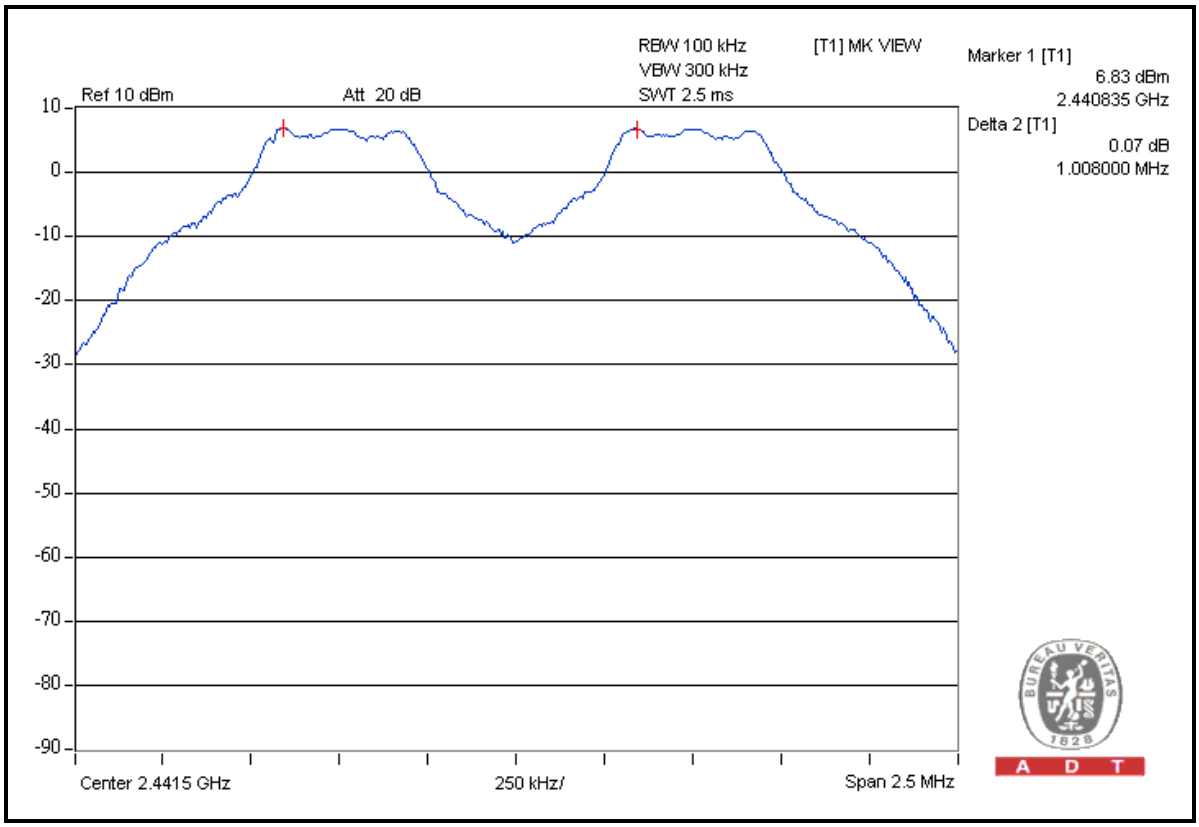
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.000	0.836	0.557	PASS
39	2441	1.008	0.831	0.554	PASS
78	2480	1.000	0.842	0.561	PASS

NOTE: The minimum limit is two-third 20dB bandwidth. Test results please refer to following three plots.

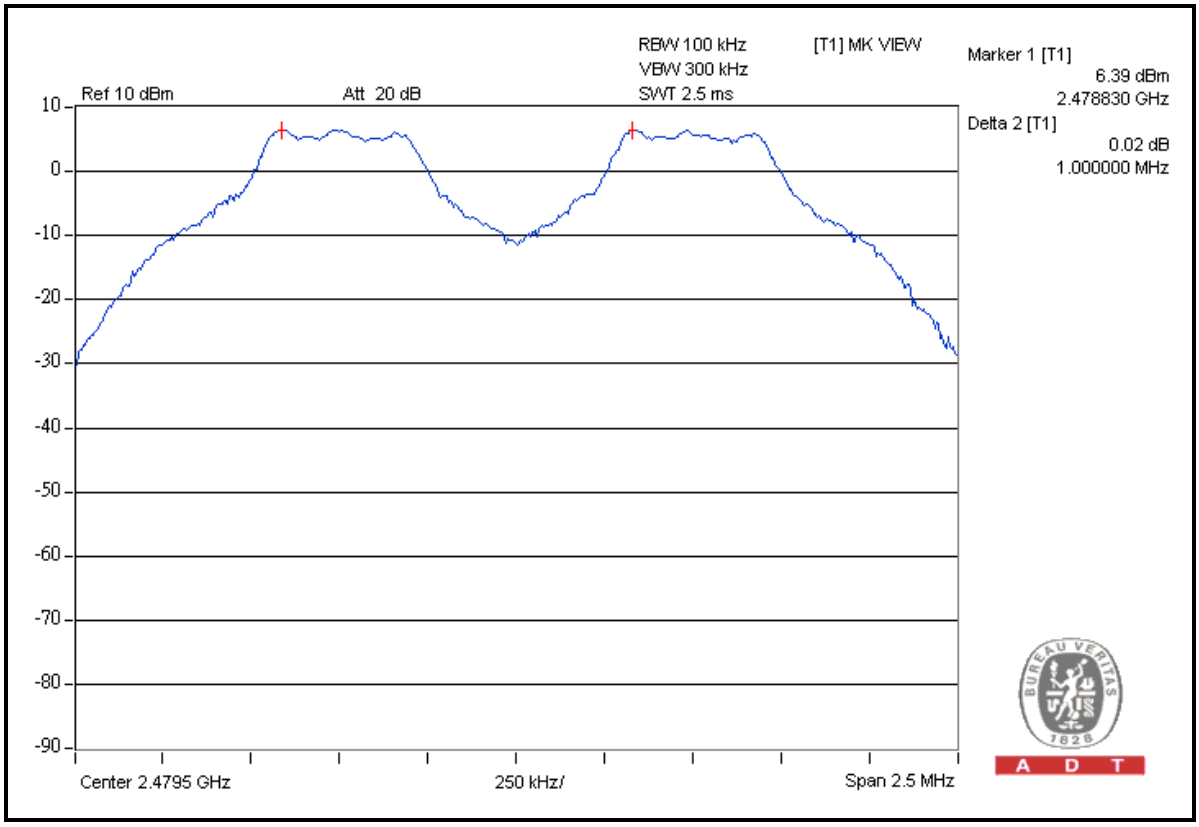
CH 0


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.91 dBm
2.401830 GHz
Delta 2 [T1]
0.26 dB
1.000000 MHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4025 GHz
250 kHz/
Span 2.5 MHz

CH 39


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.83 dBm
2.440835 GHz
Delta 2 [T1]
0.07 dB
1.008000 MHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4415 GHz
250 kHz/
Span 2.5 MHz

CH 78


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.39 dBm
2.478830 GHz
Delta 2 [T1]
0.02 dB
1.000000 MHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4795 GHz
250 kHz/
Span 2.5 MHz

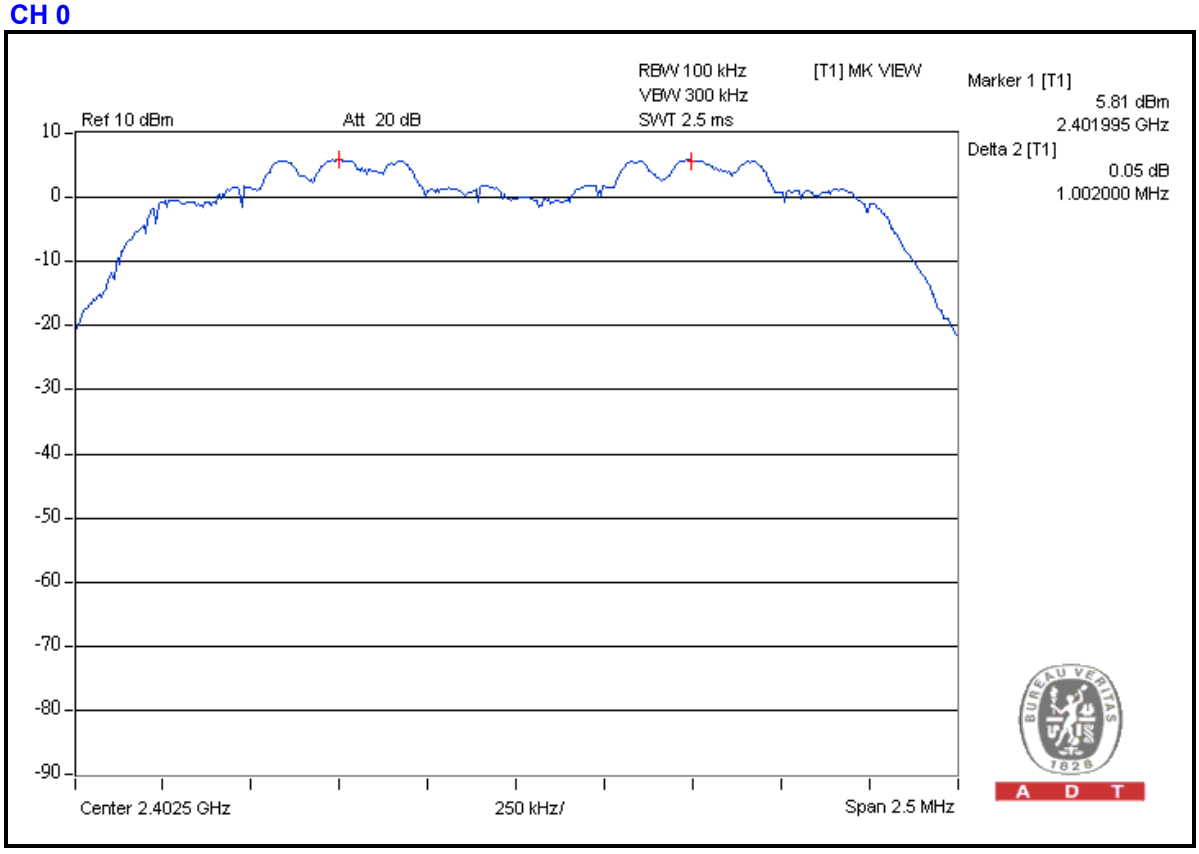
FOR 8DPSK

TEST MODE	A	**CHANNEL**	0, 39, 78
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	21deg. C, 63% RH, 1004hPa
TESTED BY	Chad Lee		

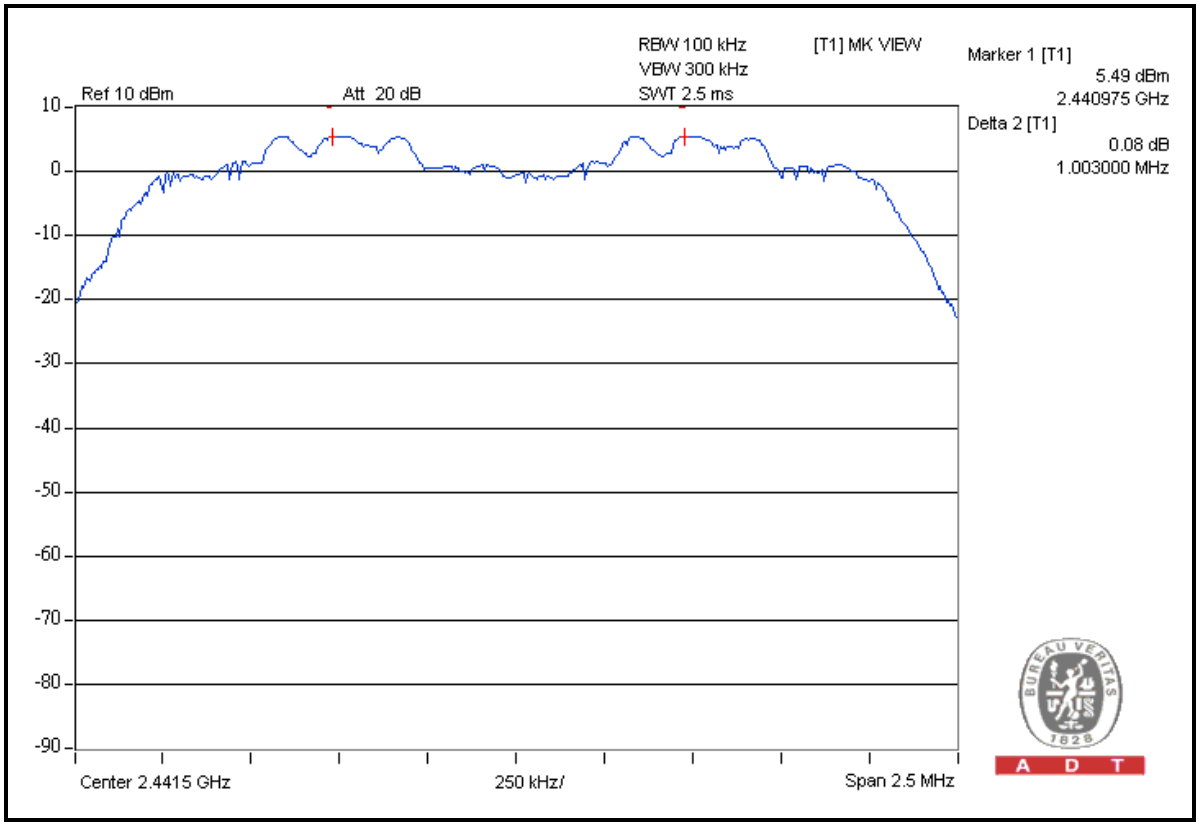
CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	1.002	1.211	0.807	PASS
39	2441	1.003	1.216	0.811	PASS
78	2480	1.000	1.213	0.809	PASS

NOTE: The minimum limit is two-third 20dB bandwidth. Test results please refer to following three plots.

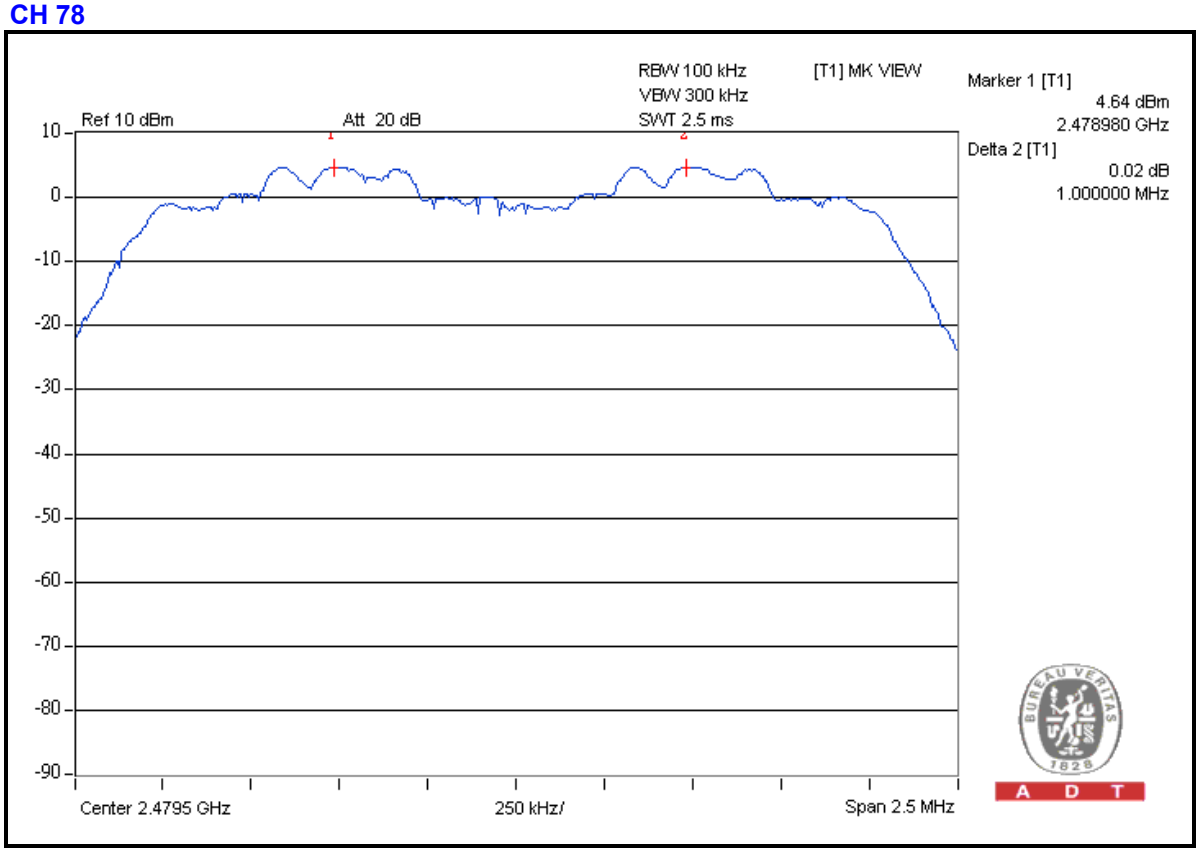
CH 0



CH 39


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
5.49 dBm
2.440975 GHz
Delta 2 [T1]
0.08 dB
1.003000 MHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4415 GHz
250 kHz/
Span 2.5 MHz

CH 78


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
4.64 dBm
2.478980 GHz
Delta 2 [T1]
0.02 dB
1.000000 MHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

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.

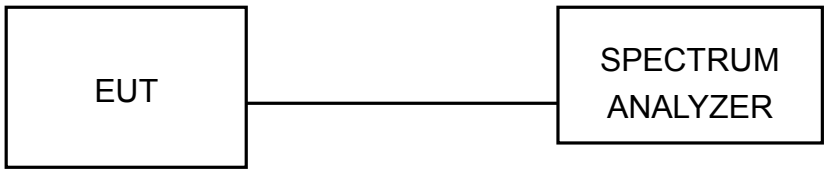
d. Measure the captured power within the band and recording the plot.

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.

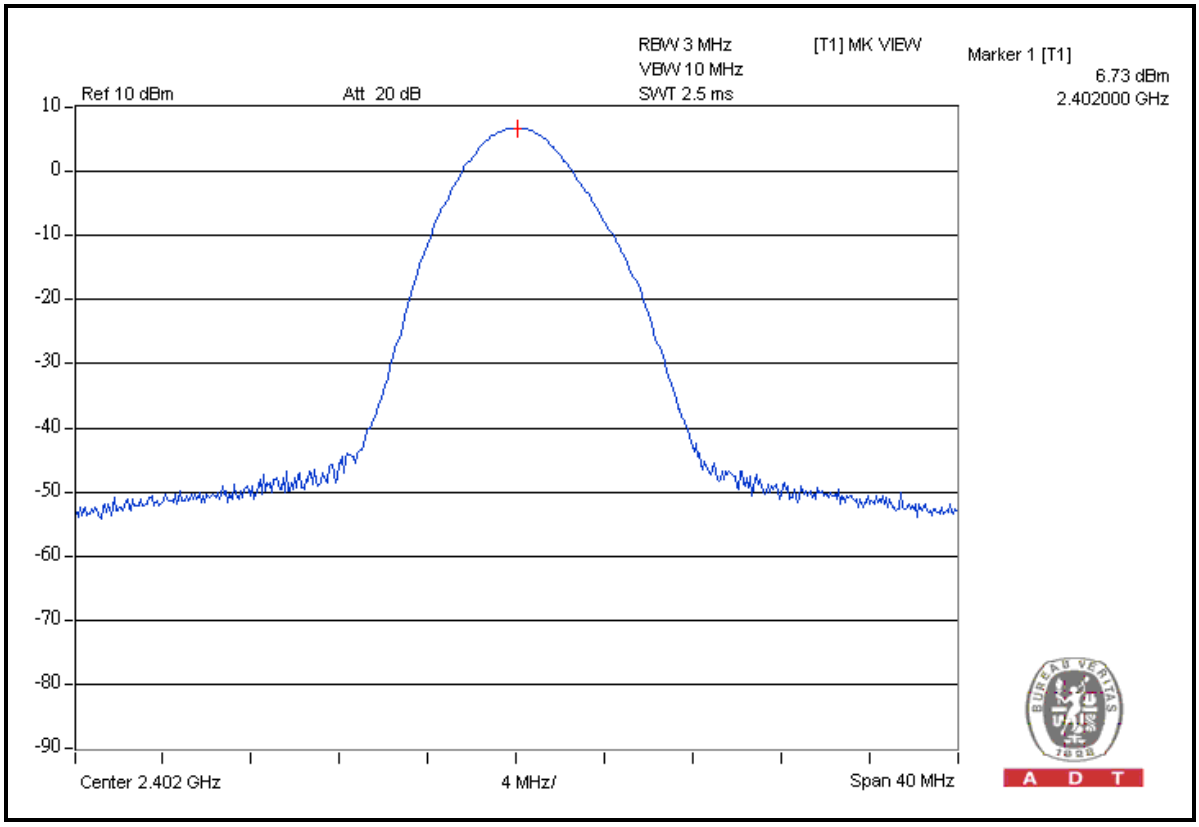
4.7.7 TEST RESULTS

FOR GFSK

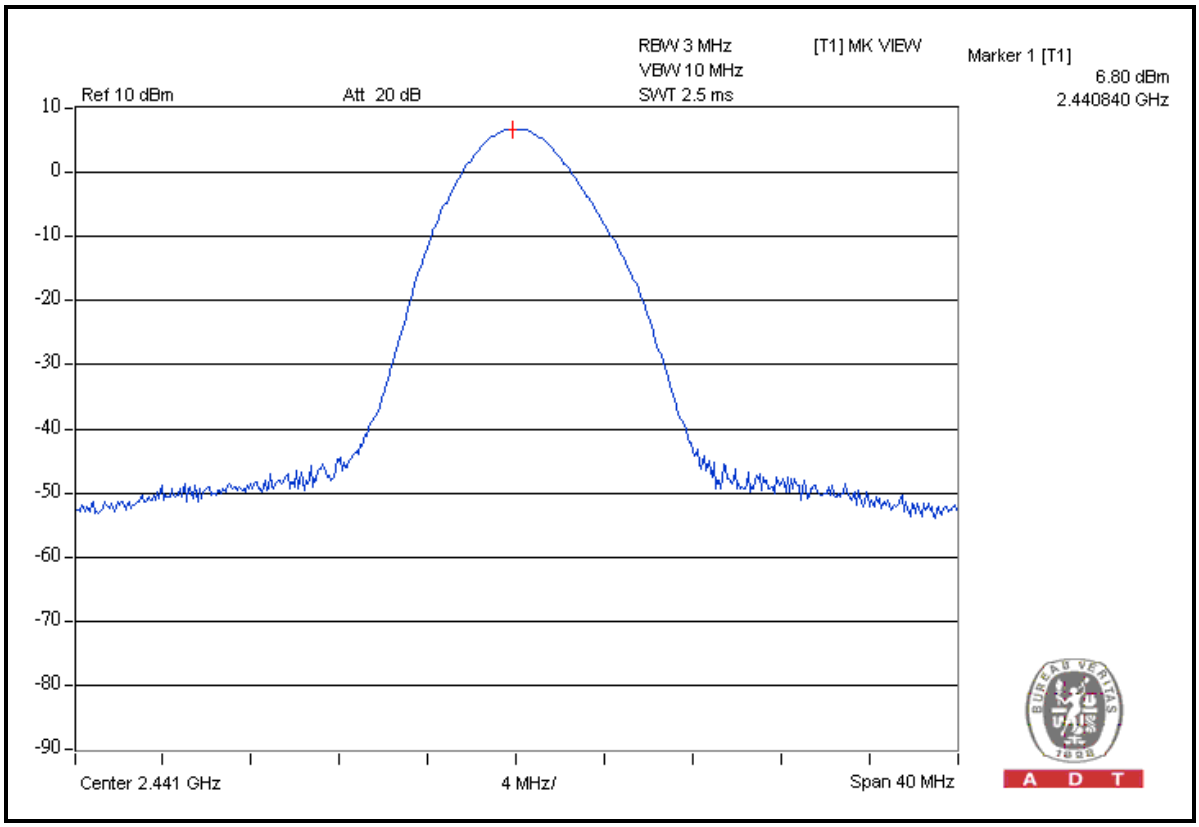
TEST MODE	A	**CHANNEL**	0, 39, 78
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	19deg. C, 70% RH, 1010hPa
TESTED BY	Chad Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	6.73	4.710	125	PASS
39	2441	6.80	4.786	125	PASS
78	2480	6.67	4.645	125	PASS

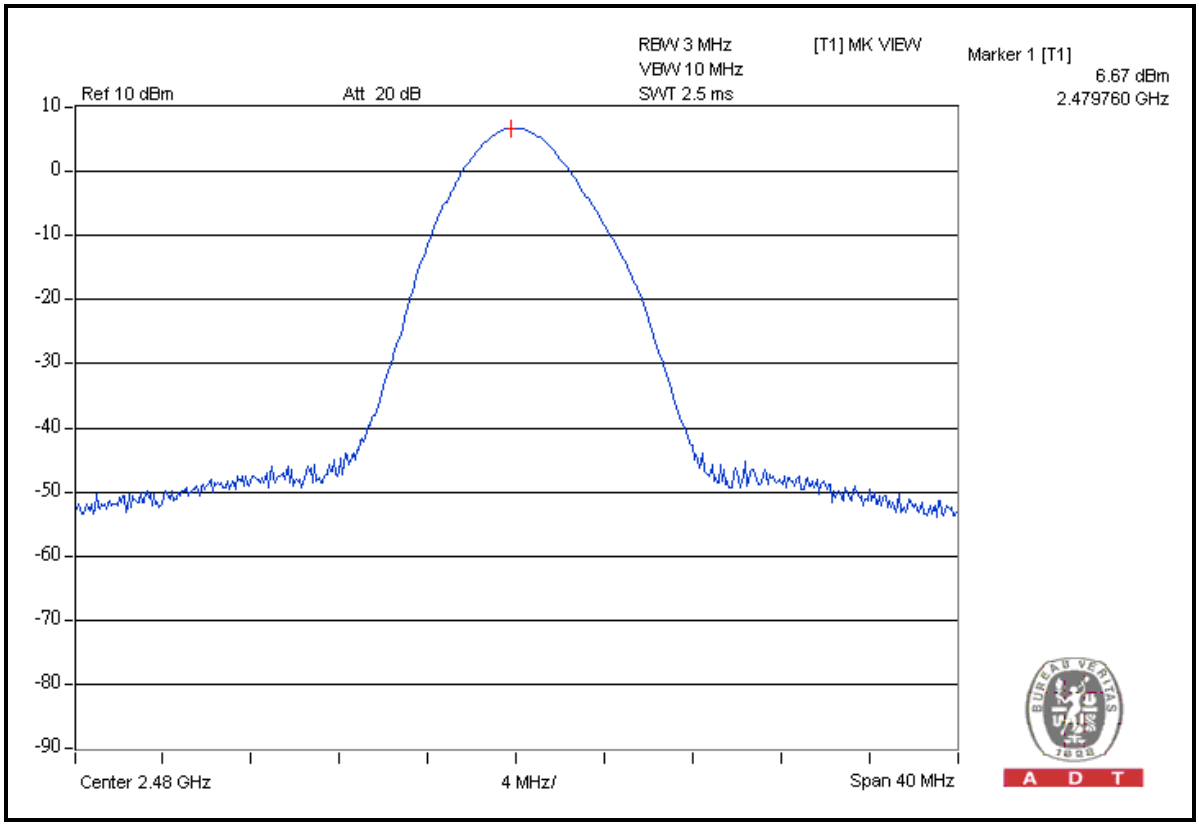
CH 0


RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.73 dBm
2.402000 GHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
4 MHz/
Span 40 MHz

CH 39


RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.80 dBm
2.440840 GHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
4 MHz/
Span 40 MHz

CH 78

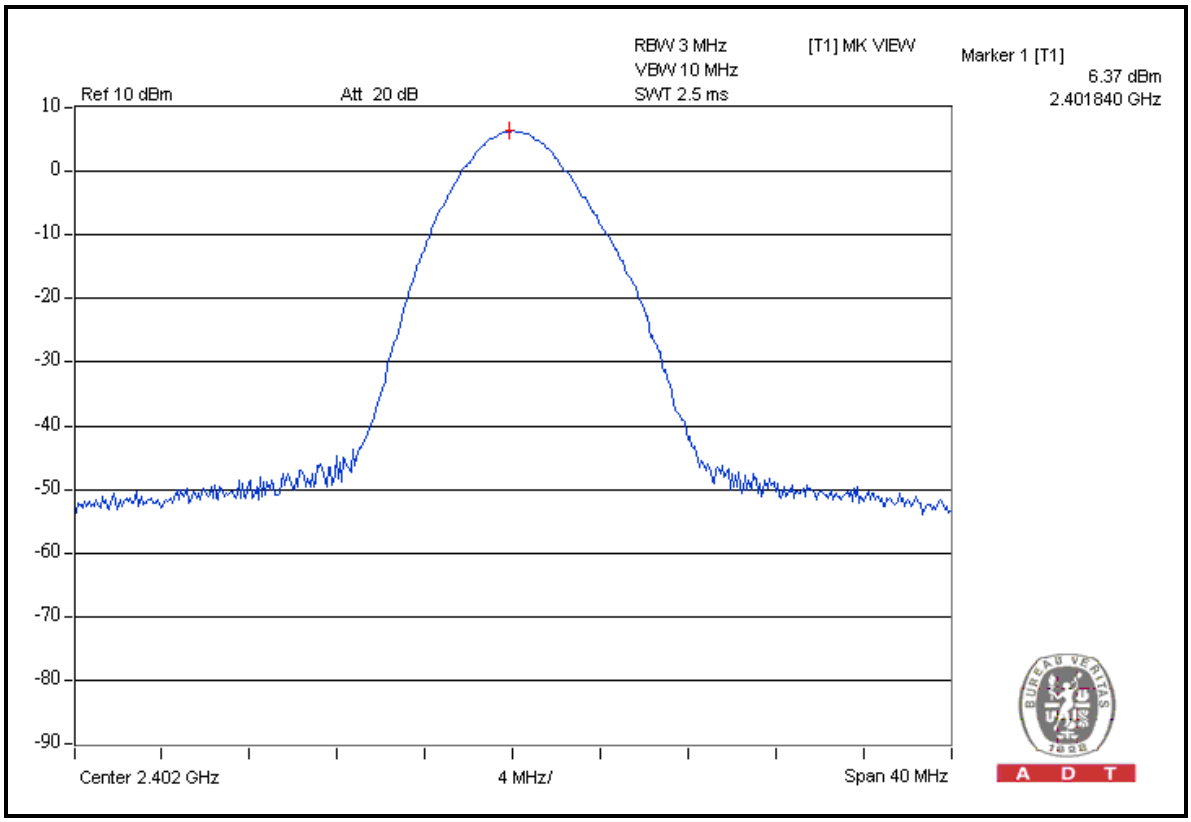

RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.67 dBm
2.479760 GHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
4 MHz/
Span 40 MHz

FOR 8DPSK

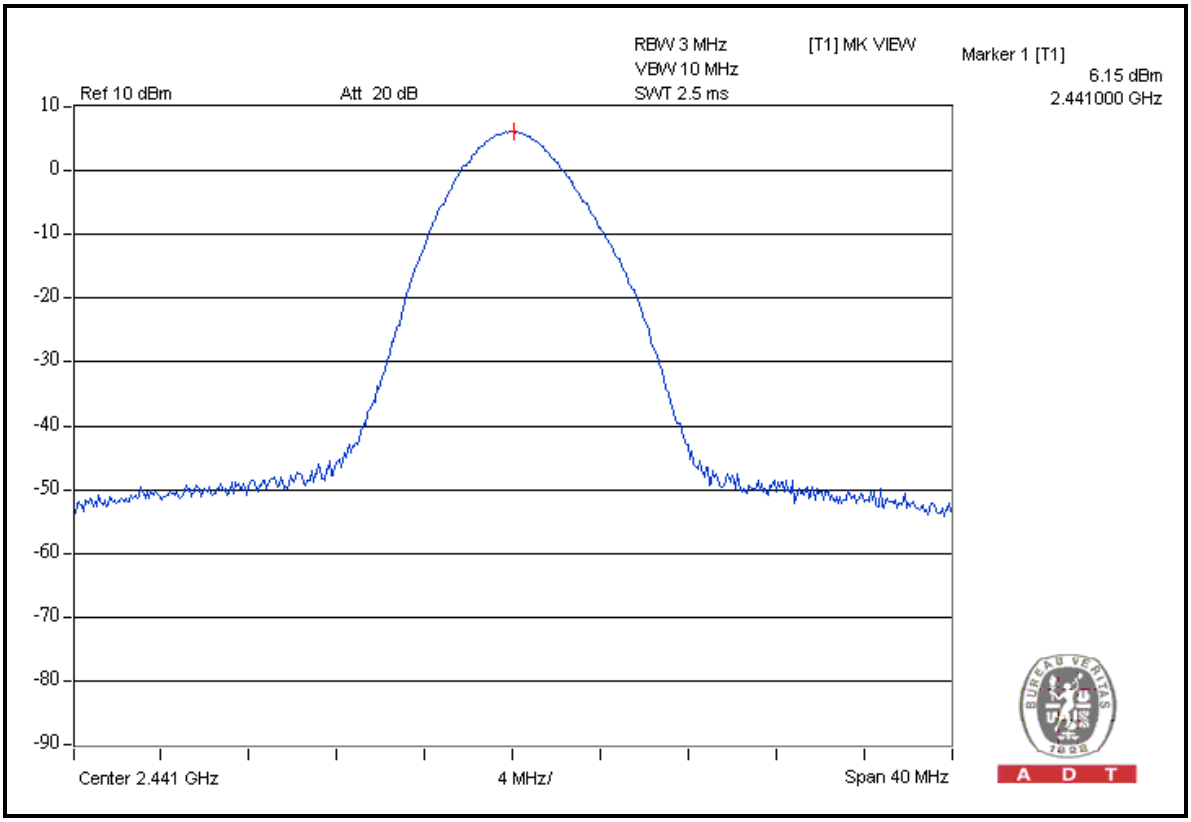
TEST MODE	A	**CHANNEL**	0, 39, 78
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	19deg. C, 70% RH, 1010hPa
TESTED BY	Chad Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	2402	6.37	4.335	125	PASS
39	2441	6.15	4.121	125	PASS
78	2480	5.79	3.793	125	PASS

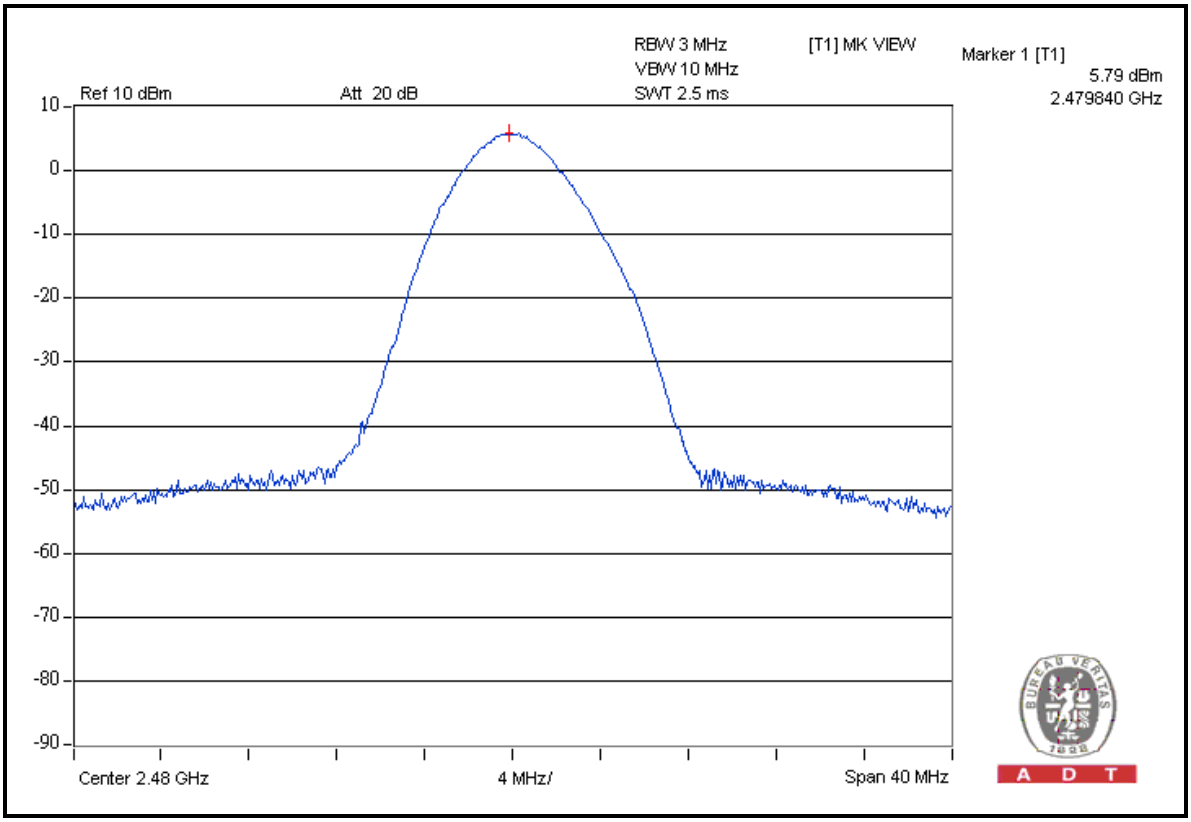
CH 0



CH 39


RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
6.15 dBm
2.441000 GHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
4 MHz/
Span 40 MHz

CH 78


RBW 3 MHz
VBW 10 MHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
5.79 dBm
2.479840 GHz
Ref 10 dBm
Att 20 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
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 DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER	FSP 40	100036	Apr. 03, 2009	Apr. 02, 2010

NOTE: 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 and 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.
The spectrum plots are attached on the following pages.

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 8 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).

Mode A: FOR GFSK

NOTE 1:
The band edge emission plot on the next page shows 62.55dBc between carrier maximum power and local maximum emission in restrict band (2.3762GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 109.24dBuV/m (Peak), so the maximum field strength in restrict band is 109.24 – 62.55 = 46.69dBuV/m, which is under 74 dBuV/m limit.

Average value = 46.69 - 30.10= 16.59dBuV/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)= -30.1 dB.

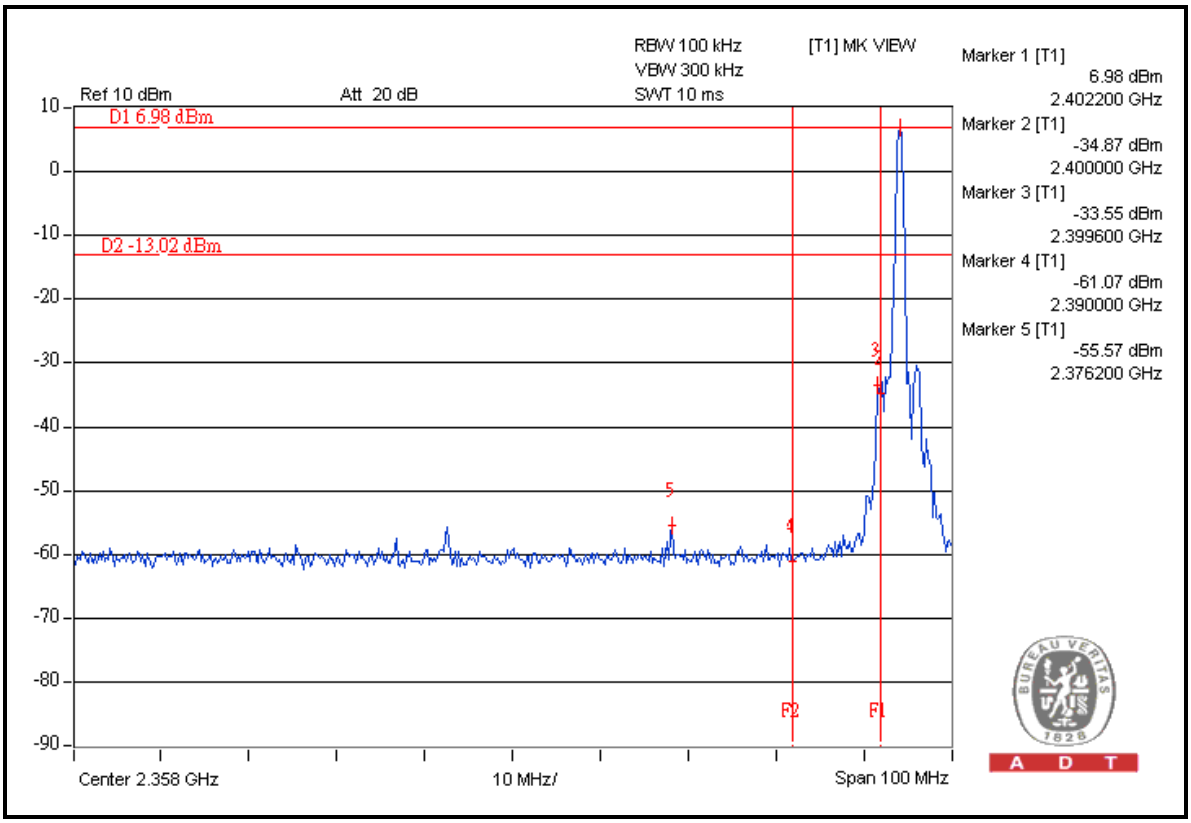
Average value = peak reading –30.10.

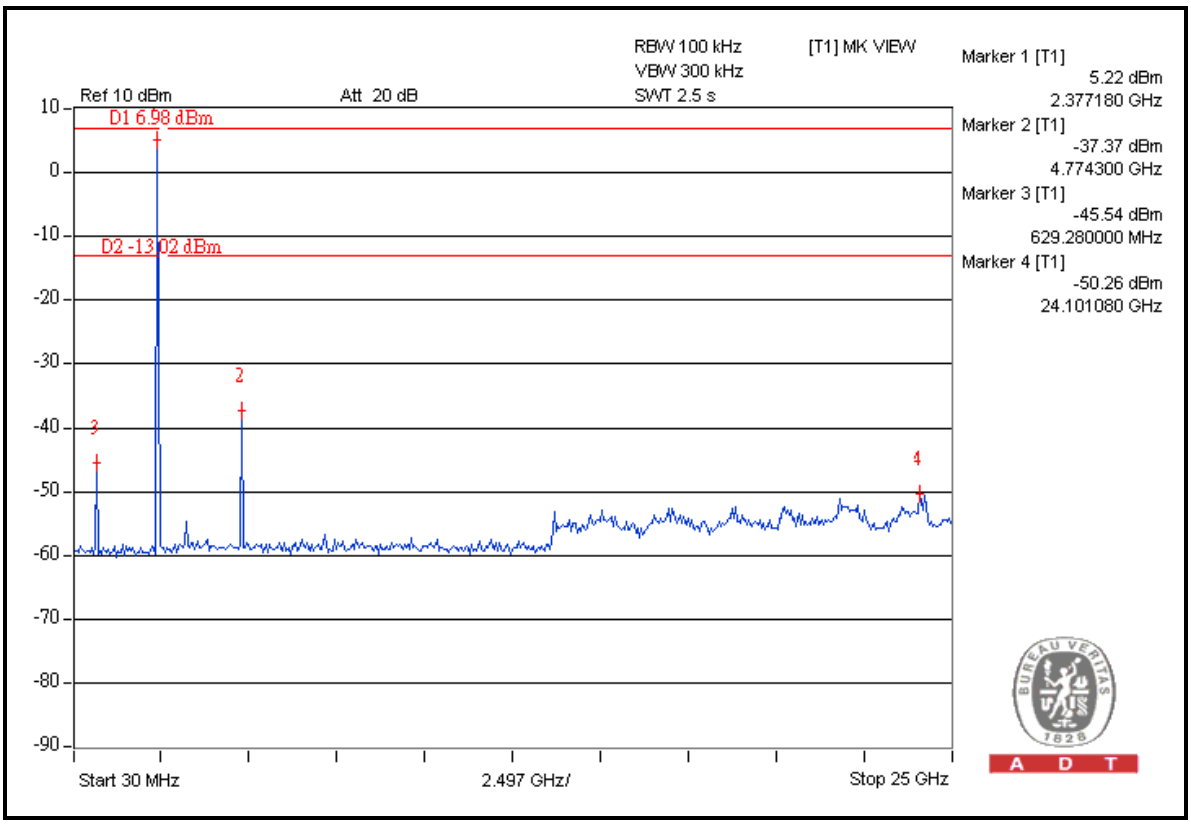
NOTE 2:
The band edge emission plot on the next second page shows 62.04dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 103.74dBuV/m (Peak), so the maximum field strength in restrict band is 103.74 – 62.04 = 41.70dBuV/m, which is under 74 dBuV/m limit.

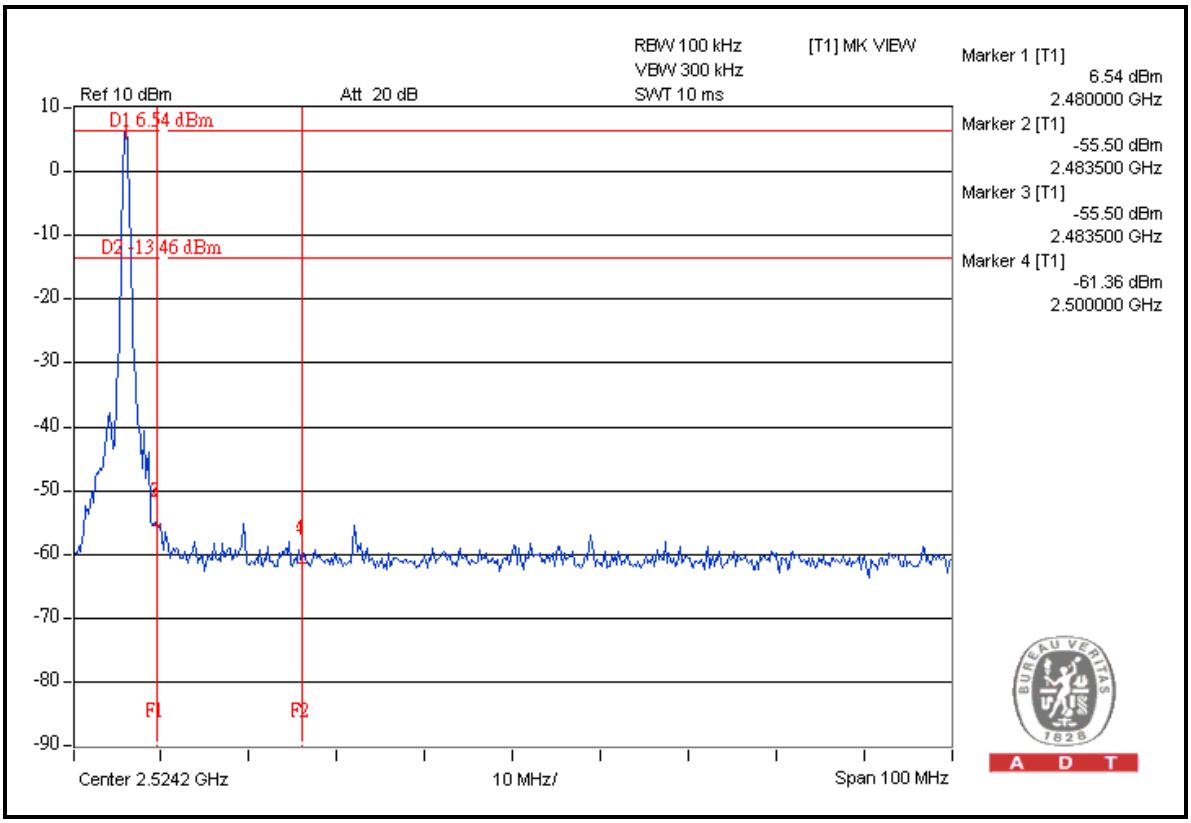
Average value = 41.70 - 30.10= 11.60dBuV/m, which is under 54dBuV/m limit.

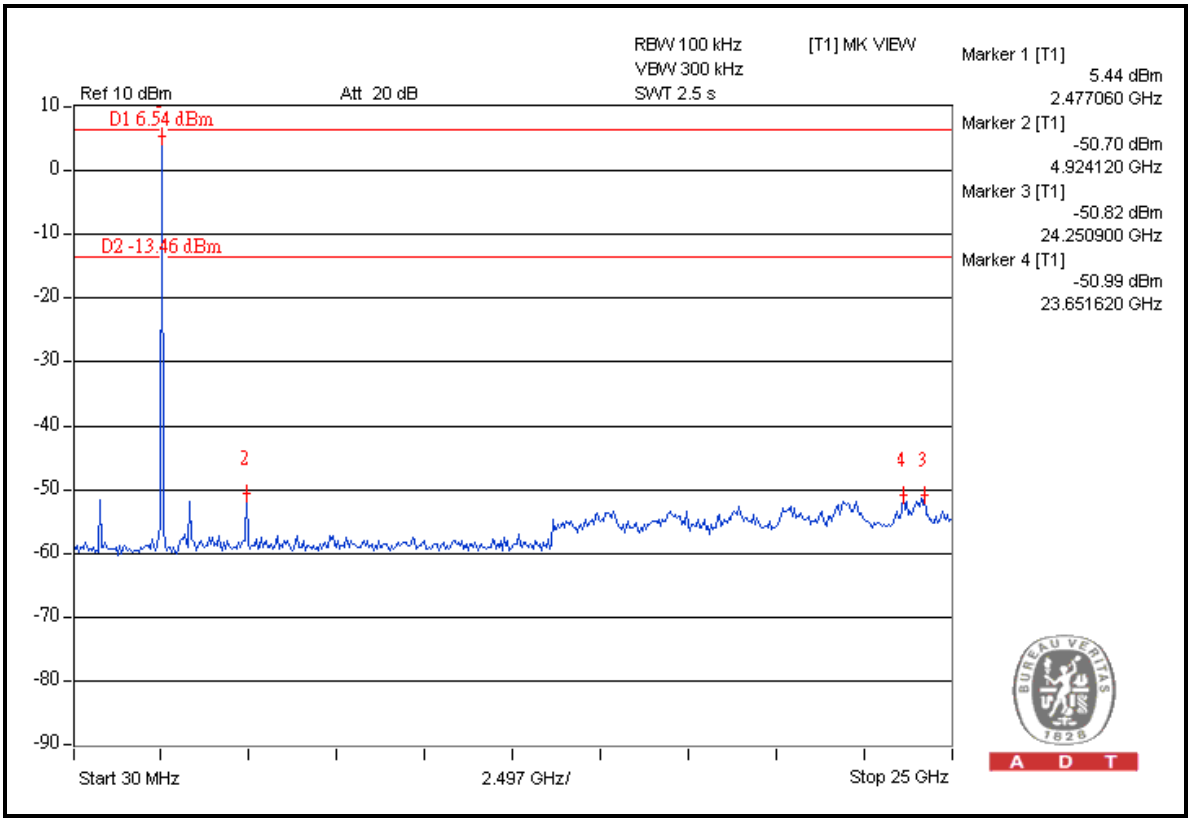
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30.1 dB.

Average value = peak reading –30.10.


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 6.98 dBm
D2 -13.02 dBm
Marker 1 [T1]
6.98 dBm
2.402200 GHz
Marker 2 [T1]
-34.87 dBm
2.400000 GHz
Marker 3 [T1]
-33.55 dBm
2.399600 GHz
Marker 4 [T1]
-61.07 dBm
2.390000 GHz
Marker 5 [T1]
-55.57 dBm
2.376200 GHz
Center 2.358 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 6.98 dBm
D2 -13.02 dBm
Marker 1 [T1]
5.22 dBm
2.377180 GHz
Marker 2 [T1]
-37.37 dBm
4.774300 GHz
Marker 3 [T1]
-45.54 dBm
629.280000 MHz
Marker 4 [T1]
-50.26 dBm
24.101080 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Marker 1 [T1]
6.54 dBm
2.480000 GHz
Marker 2 [T1]
-55.50 dBm
2.483500 GHz
Marker 3 [T1]
-55.50 dBm
2.483500 GHz
Marker 4 [T1]
-61.36 dBm
2.500000 GHz
Ref 10 dBm
Att 20 dB
D1 6.54 dBm
D2 -13.46 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
F1
F2
Center 2.5242 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Marker 1 [T1]
5.44 dBm
2.477060 GHz
Marker 2 [T1]
-50.70 dBm
4.924120 GHz
Marker 3 [T1]
-50.82 dBm
24.250900 GHz
Marker 4 [T1]
-50.99 dBm
23.651620 GHz
Ref 10 dBm
Att 20 dB
D1 6.54 dBm
D2 -13.46 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Start 30 MHz
2.497 GHz/
Stop 25 GHz

Mode A: FOR 8DPSK

NOTE 1:

The band edge emission plot on the next page shows 63.19dBc between carrier maximum power and local maximum emission in restrict band (2.3762GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 107.78dBuV/m (Peak), so the maximum field strength in restrict band is 107.78 – 63.19 = 44.59dBuV/m, which is under 74 dBuV/m limit.

Average value = 44.59 - 30.10= 14.49dBuV/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)= -30.1 dB.

Average value = peak reading –30.10.

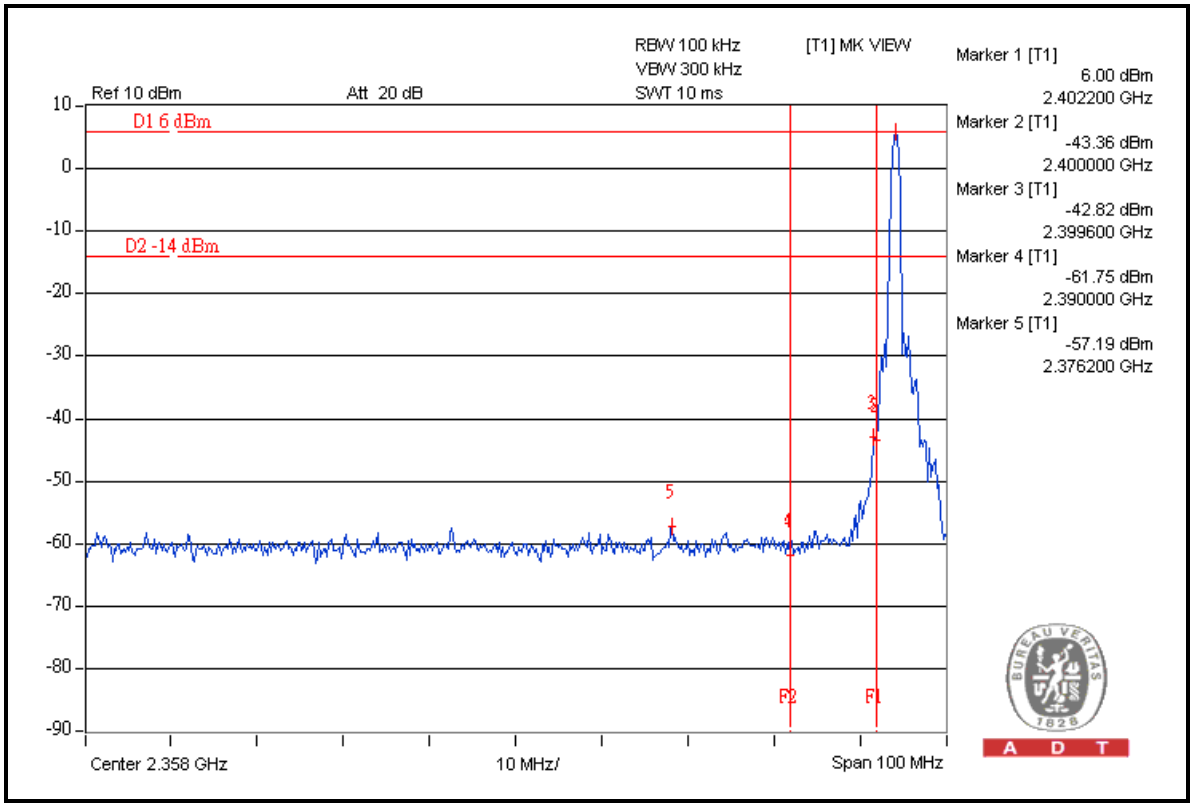
NOTE 2:

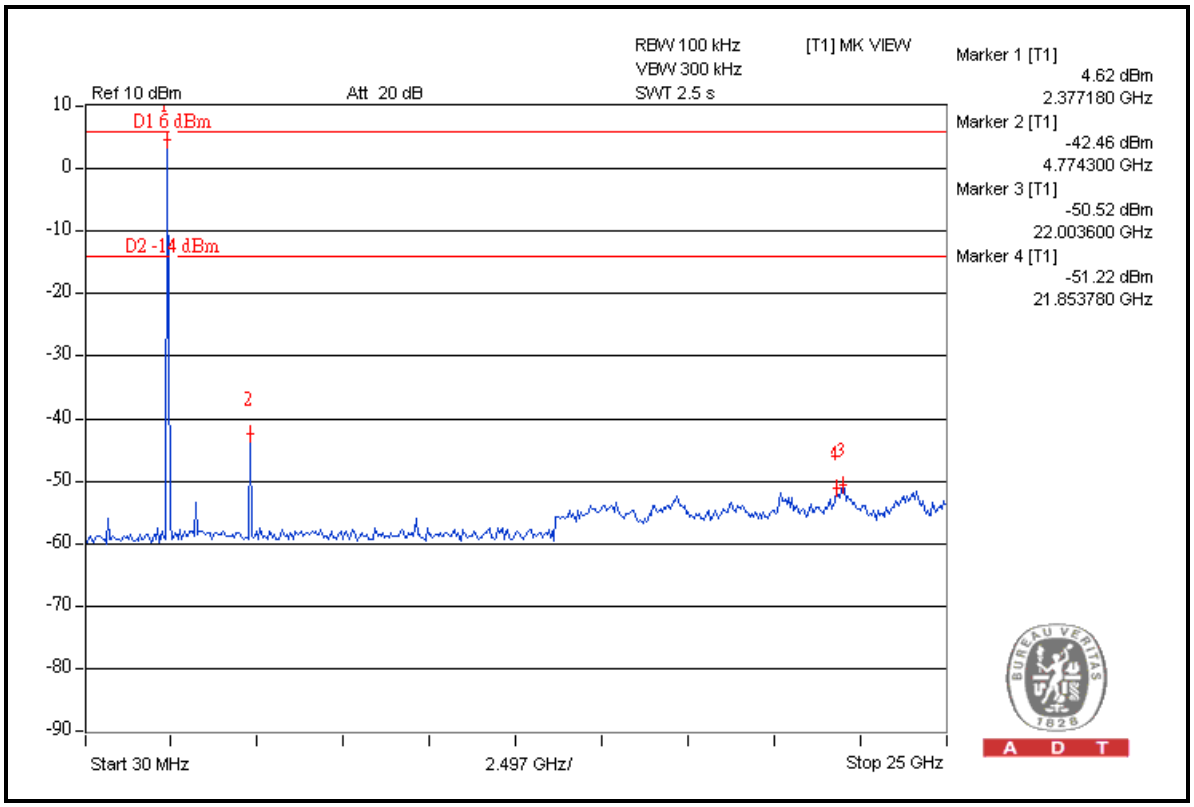
The band edge emission plot on the next second page shows 60.85dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 105.43dBuV/m (Peak), so the maximum field strength in restrict band is 105.43 – 60.85 = 44.58dBuV/m, which is under 74 dBuV/m limit.

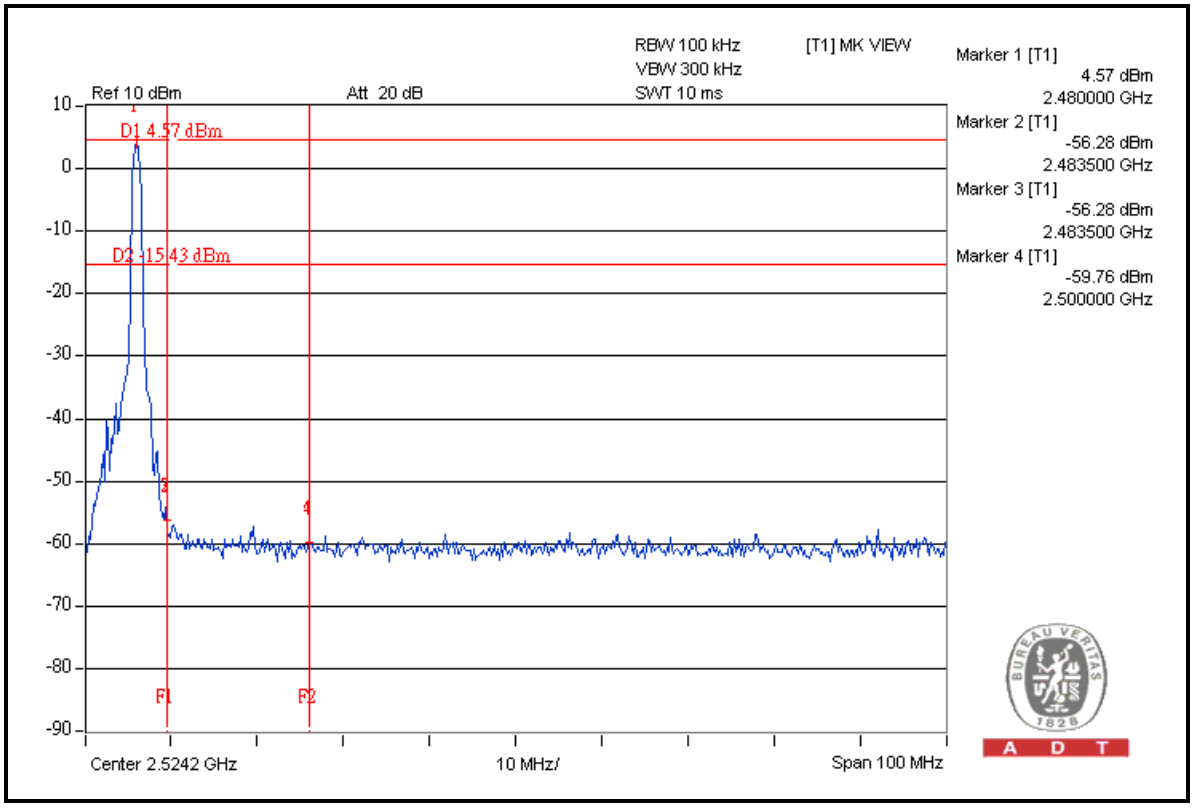
Average value = 44.58 - 30.10= 14.48dBuV/m, which is under 54dBuV/m limit.

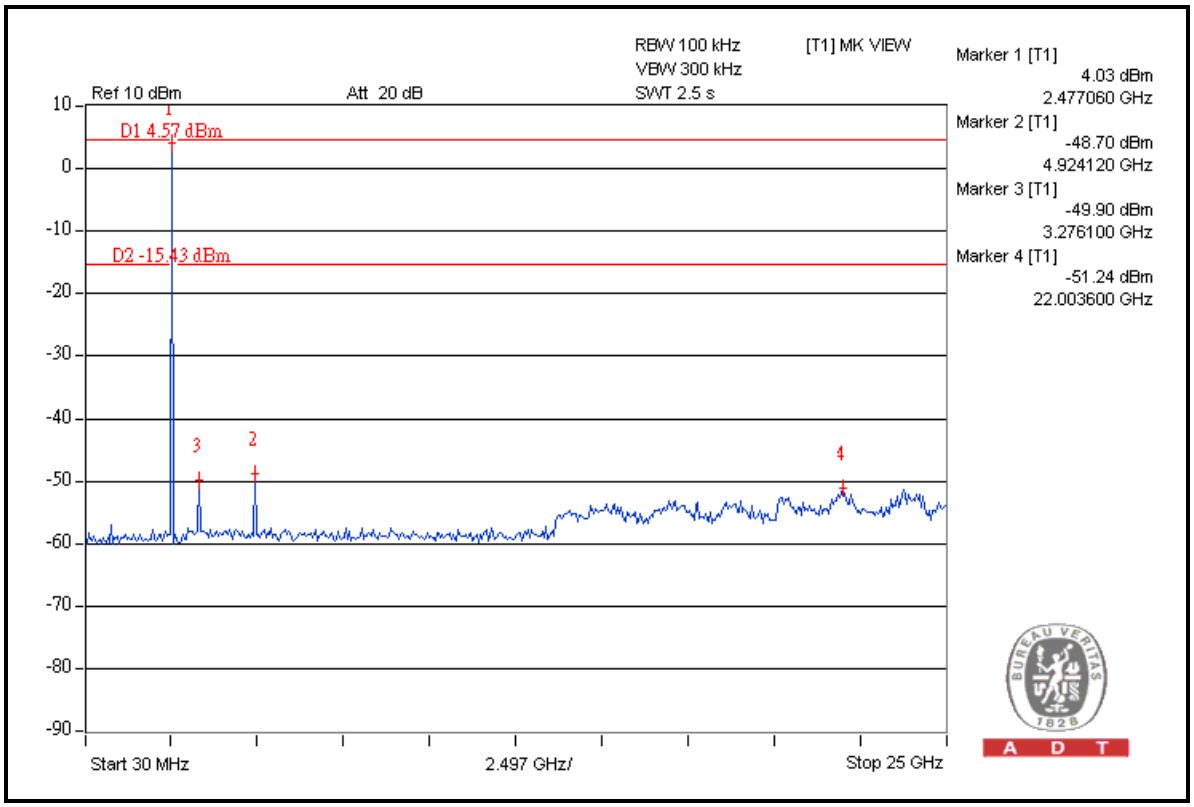
*The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle be equal to: 20log(3.125/100)= -30.1 dB.

Average value = peak reading –30.10.


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 6 dBm
D2 -14 dBm
Marker 1 [T1]
6.00 dBm
2.402200 GHz
Marker 2 [T1]
-43.36 dBm
2.400000 GHz
Marker 3 [T1]
-42.82 dBm
2.399600 GHz
Marker 4 [T1]
-61.75 dBm
2.390000 GHz
Marker 5 [T1]
-57.19 dBm
2.376200 GHz
Center 2.358 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 6 dBm
D2 -14 dBm
Marker 1 [T1]
4.62 dBm
2.377180 GHz
Marker 2 [T1]
-42.46 dBm
4.774300 GHz
Marker 3 [T1]
-50.52 dBm
22.003600 GHz
Marker 4 [T1]
-51.22 dBm
21.853780 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 4.57 dBm
D2 -15.43 dBm
Marker 1 [T1]
4.57 dBm
2.480000 GHz
Marker 2 [T1]
-56.28 dBm
2.483500 GHz
Marker 3 [T1]
-56.28 dBm
2.483500 GHz
Marker 4 [T1]
-59.76 dBm
2.500000 GHz
F1
F2
Center 2.5242 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 10 dBm
Att 20 dB
D1 4.57 dBm
D2 -15.43 dBm
Marker 1 [T1]
4.03 dBm
2.477060 GHz
Marker 2 [T1]
-48.70 dBm
4.924120 GHz
Marker 3 [T1]
-49.90 dBm
3.276100 GHz
Marker 4 [T1]
-51.24 dBm
22.003600 GHz
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 IFA antenna without antenna connector. The maximum gain of this antenna is 2.82dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, 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, NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA, CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	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.

7. 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.

---END---