



**CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C
and
Canada RSS-210**

Report No.: 09-06-MAS-243-01

Client: Ezurio Limited.
Product: Bluetooth Multimedia Module
Model: BTM510
IC ID: 1931B-BTM510B

Manufacturer/supplier: Aerocomm Inc

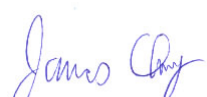
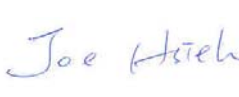
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Date test campaign completed: 2009/10/12
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Total number of pages of this test report: 82 pages

Total number of pages of photos: External photos 2 pages

Setup photos 3 pages

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Client : Ezurio Limited.
Address : Saturn House, Mercury Park, Wycombe Lane, Wooburn Green HP10 0HH UK
Manufacturer : Aerocomm Inc
Address : 11160 Thompson Ave Lenexa, KS 66219
EUT : Bluetooth Multimedia Module
Trade name : EZURiO
Model No. : BTM510
Power Source : DC 3.6V (From Test Jig to Module)
Regulations applied : FCC 47 CFR, Part 15 Subpart C (2008)

Canada RSS-210 Issue 7 (2007) / RSS-Gen Issue 2 (2007)

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- ⑤ FCC Registration Number: 90588, 91094, 91095



NVLAP Lab Code 200133-0

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1 GENERAL INFORMATION

1.1 Product Description

- a) Type of EUT : Bluetooth Multimedia Module
- b) Trade Name : EZURiO
- c) Model No. : BTM510

1.2 Characteristics of Device

The EUT is a Bluetooth Multimedia Module based on the Bluetooth technology. Bluetooth is a short-range radio link intended to be a cable replacement between portable or fixed electronic devices. Bluetooth operates in the unlicensed ISM Band at 2.4GHz. In this band, 79 RF channels spaced 1MHz apart are defined. The rated output power is 2.82 dBm (1.91 mW).

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 (2003) an FCC CFR 47 Part 2 and Part 15.

1.4 Modifiction List of EUT

N/A

1.5 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

1.6 Test Summary

Requirement	FCC Paragraph #	IC Paragraph #	Test Pass
Radiated Emission	15.247 (c)	RSS-210_2.2	☒
Conducted Emission	15.207	RSS-Gen_7.2.2	☒
Antenna Requirement	15.203	RSS-Gen_7.1.4	☒
20dB Emission Bandwidth	15.247 (a)(1)	RSS-210_A8.1(a)	☒
Output Power	15.247 (b)(1)	RSS-210_A8.4(2)	☒
OUT-OF-BAND RF Conducted Spurious Emission	15.247 (c)	RSS-210_A8.5	☒
Number of Hopping Channels	15.247 (b)(1)	RSS-210_A8.4(2)	☒
Hopping Channel Carrier Frequency Seperated	15.247 (a)(1)	RSS-210_A8.1(a)	☒
Dwell Time	15.247 (a)(1)(iii)	RSS-210_A8.1(d)	☒

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :

A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:

A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

For unintentional device, according to §15.107(a) Line Conducted Emission Limits is as following:

Frequency MHz	Quasi Peak dB μ V	Average dB μ V
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as above table.

(2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
above 960	3	54.0	500

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

(3) Antenna Requirement

For intentional device, according to §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.

(4) 20dB Bandwidth Requirement

For frequency hopping systems, according to 15.247(a)(1), hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

(5) Output Power Requirement

For frequency hopping systems, according to 15.247(1), operating in the 2400-2483.5MHz band employing at least 75 hopping channels. The maximum peak output power of the transmitter shall not exceed 1 Watt. 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.

(6) 100 kHz Bandwidth of Frequency Band Edges Requirement

According to 15.247(c), if any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in §15.209(a), whichever results in the lesser attenuation.

(7) Number of Hopping Channels

According to 15.247(b)(1), for frequency hopping systems, operating in the 2400-2483.5MHz band employing at least 75 hopping channels.

(8) Channel Carrier Frequencies Separation

According to 15.247(a)(1)(iii), the frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

(9) Dwell Time

According to 15.247(a)(1)(iii), frequency hopping system in the 2400-2483.5MHz band employing at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 second multiplied by the number of hopping channels employed.

(10) Power Spectral Density

According to 15.247(d), for bluetooth device, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

To comply with the FCC RF exposure compliance requirement, this device and its antenna must not be co-located or operating to conjunction with any other antenna or transmitter.

3. SYSTEM TEST CONFIGURATION

3.1 Justification

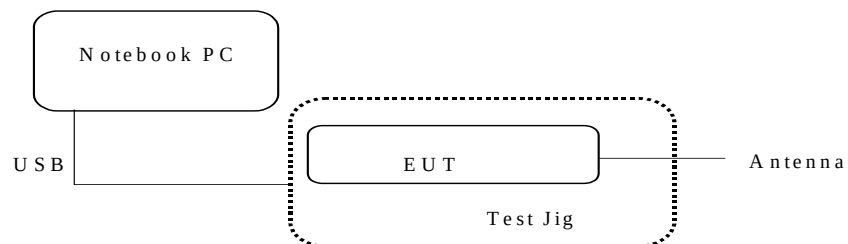
For the purposes of this test report ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT during the test. Notebook PC was used to control the RF channel under the highest, middle and lowest frequency and transmit the maximum RF power. Customer would not use it. But never the less ancillary equipment can influence the test results..

3.2 Devices for Tested System

Device	Manufacture	Model	Cable Description
* Bluetooth Multimedia Module	Aerocomm Inc	BTM510	----
Notebook PC	HP	nx6320	3.1m*1, Unshielded Power Line
Test Jig	N/A	N/A	1.5m Unshielded Signal Line/USB

Remark

1. “*” means equipment under test.



2. Software setting: Bluetest .exe
3. Power setting (Ext, Int): (255,52)

4 RADIATED EMISSION MEASUREMENT

4.1 Applicable Standard

For unintentional radiator, the radiated emission shall comply with §15.109(a).

For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and digitally modulated, and the out band emission shall be comply with § 15.247 (c)

4.2 Measurement Procedure

A.Preliminary Measurement For Portable Devices.

For movable devices, the following procedure was performed to determine the maximum emission axis of EUT (X and Y axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “Y axis”. (Please see the test setup photos)

B. Final Measurement

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively. Turn on EUT and make sure that it is in continuous operating function.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions and then each selected frequency is precisely measured. As the same purpose, for emission measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

Figure 1 : Frequencies measured below 1 GHz configuration

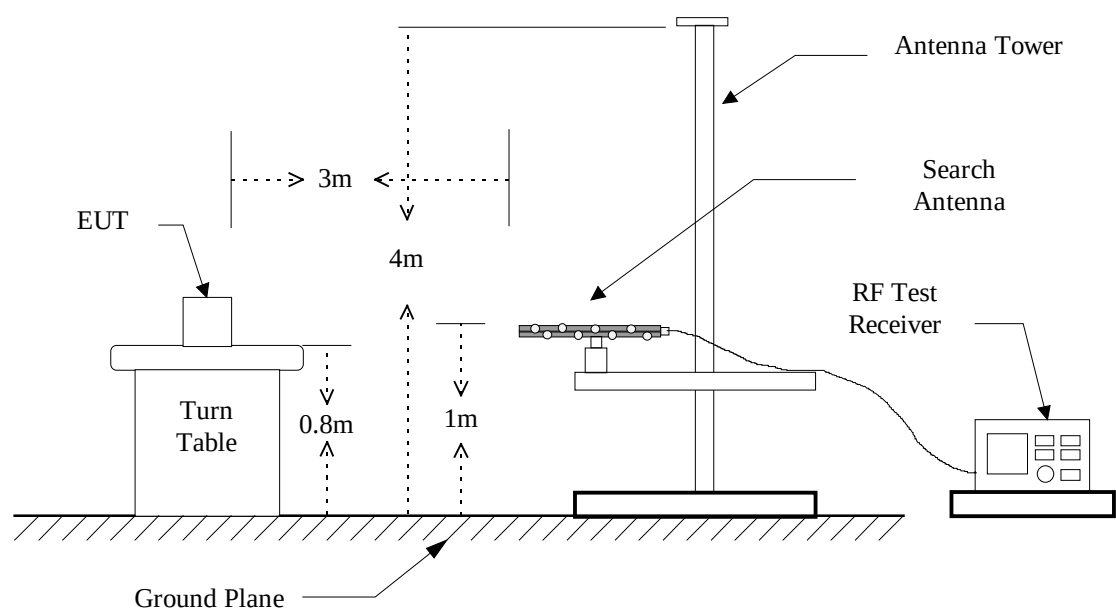
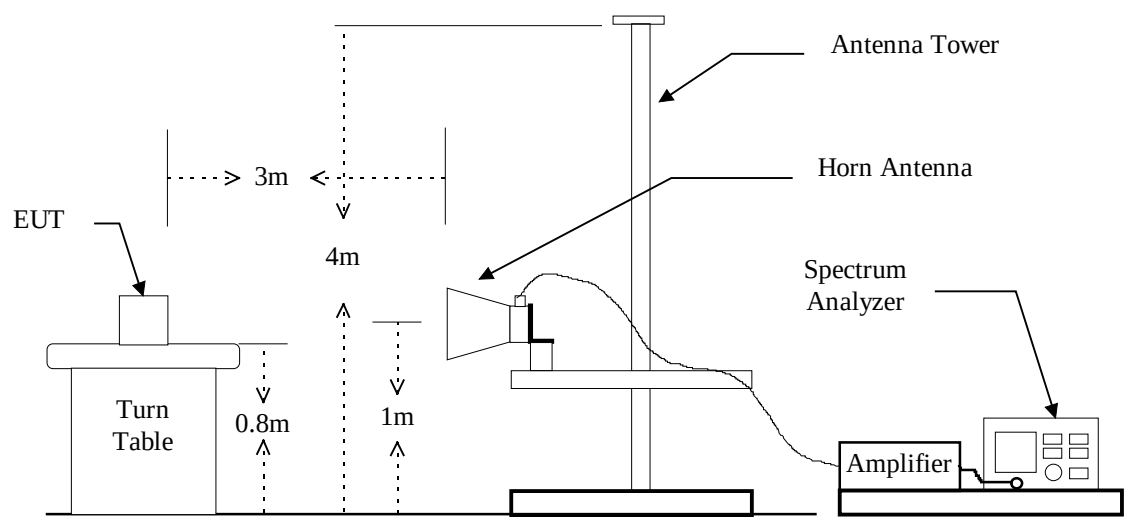


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Receiver	R&S	ESIB7	13054414-001	07/19/2010
BiLog Antenna	Schaffner	CBL 6112B	2927	08/18/2010
Horn Antenna	EMCO	3115	9107-3729	12/07/2009
PRE-Amplifier	Agilent	8449B	3008A01648	10/08/2009
Spectrum Analyzer	R&S	FSU46	13040904-001	11/24/2009
Spectrum Analyzer	Agilent	8564EC	4123A00585	10/13/2009

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	RF Test Receiver	Peak	120 kHz	300 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

4.4 Radiated Emission Data

4.4.1 RF Portion

4.4.1.1 Operation Mode: GFSK

a) Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Jun. 18, 2009

Temperature : 28°C

Humidity : 68%

Frequency (MHz)	Reading (dBUV)				Factor (dB) Corr.	Result @3m (dBUV/m) Peak Ave (H/V Max.)		Limit @3m (dBUV/m) Peak Ave.	
	H Peak	H Ave	V Peak	V Ave		Peak	Ave	Peak	Ave.
4804.000	---	---	---	---	0.6	---	---	74.0	54.0
7206.000	---	---	---	---	2.2	---	---	74.0	54.0
9608.000	---	---	---	---	2.6	---	---	74.0	54.0

b) Channel 39

Fundamental Frequency : 2441 MHz

Frequency (MHz)	Reading (dBUV)				Factor (dB) Corr.	Result @3m (dBUV/m) Peak Ave (H/V Max.)		Limit @3m (dBUV/m) Peak Ave.	
	H Peak	H Ave	V Peak	V Ave		Peak	Ave	Peak	Ave.
4882.000	---	---	---	---	0.5	---	---	74.0	54.0
7323.000	---	---	---	---	2.9	---	---	74.0	54.0
9764.000	---	---	---	---	4.2	---	---	74.0	54.0

c) Channel 78

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBUV)				Factor (dB) Corr.	Result @3m (dBUV/m) Peak Ave (H/V Max.)		Limit @3m (dBUV/m) Peak Ave.	
	H Peak	H Ave	V Peak	V Ave		Peak	Ave	Peak	Ave.
4960.000	---	---	---	---	0.5	---	---	74.0	54.0
7440.000	---	---	---	---	2.9	---	---	74.0	54.0
9920.000	---	---	---	---	4.2	---	---	74.0	54.0
14880.000	---	---	---	---	3.1	---	---	74.0	54.0
17360.000	---	---	---	---	6.3	---	---	74.0	54.0

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark “---” means that the emissions level is too low to be measured.
3. Item “Margin” referred to Average limit while there is only peak result.
4. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

4.4.1.2 Operation Mode: 8DPSK

b) Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Jun. 18, 2009

Temperature : 28°C

Humidity : 68%

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave (H/V Max.)		Limit @3m (dBuV/m) Peak Ave.	
	H Peak	Ave	V Peak	Ave		Peak	Ave	Peak	Ave.
4804.000	---	---	---	---	0.6	---	---	74.0	54.0
7206.000	---	---	---	---	2.2	---	---	74.0	54.0
9608.000	---	---	---	---	2.6	---	---	74.0	54.0

b) Channel 39

Fundamental Frequency : 2441 MHz

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave (H/V Max.)		Limit @3m (dBuV/m) Peak Ave.	
	H Peak	Ave	V Peak	Ave		Peak	Ave	Peak	Ave.
4882.000	---	---	---	---	0.5	---	---	74.0	54.0
7323.000	---	---	---	---	2.9	---	---	74.0	54.0
9764.000	---	---	---	---	4.2	---	---	74.0	54.0

c) Channel 78

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave (H/V Max.)		Limit @3m (dBuV/m) Peak Ave.	
	H Peak	Ave	V Peak	Ave		Peak	Ave	Peak	Ave.
4960.000	---	---	---	---	0.5	---	---	74.0	54.0
7440.000	---	---	---	---	2.9	---	---	74.0	54.0
9920.000	---	---	---	---	4.2	---	---	74.0	54.0
14880.000	---	---	---	---	3.1	---	---	74.0	54.0
17360.000	---	---	---	---	6.3	---	---	74.0	54.0

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark “---” means that the emissions level is too low to be measured.
3. Item “Margin” referred to Average limit while there is only peak result.
4. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

4.4.2 Other Emission4.4.2.1 Operation Mode: TX

4.4.2.1.1 Emission frequencies below 1 GHz

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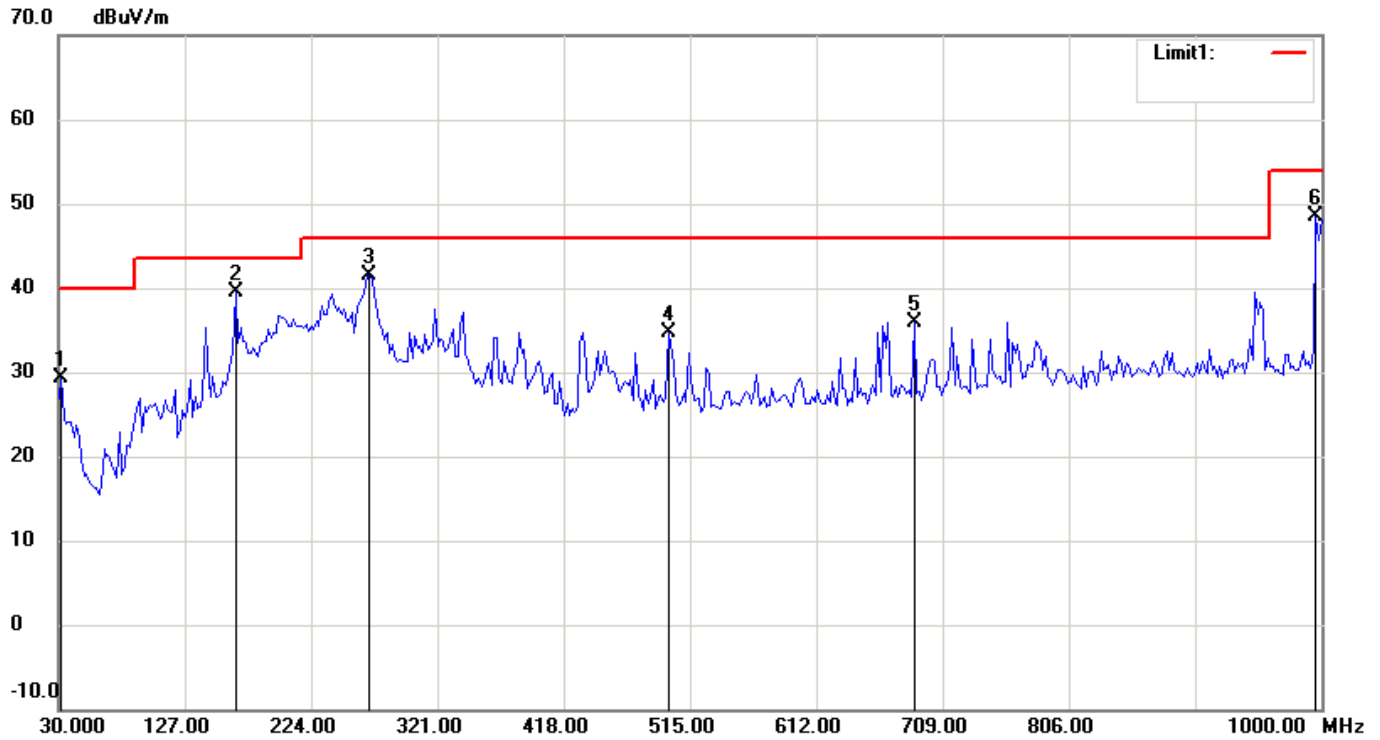
Data: #31

Date: 2009/6/18

Temperature: 28 °C

Time: PM 06:45:03

Humidity: 68 %



Condition: FCC Part 15B Class B

Polarization: Horizontal

EUT:

Distance: 3m

Model:

Test Mode:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	31.9439	6.28	peak	23.04	29.32	40.00	-10.68	254	116
2	166.0721	23.63	peak	15.82	39.45	43.50	-4.05	254	85
3	269.0982	23.26	peak	18.18	41.44	46.00	-4.56	254	226
4	498.4770	11.02	peak	23.60	34.62	46.00	-11.38	254	90
5	687.0341	10.49	peak	25.49	35.98	46.00	-10.02	254	277
6	996.1122	20.22	peak	28.25	48.47	54.00	-5.53	254	333

File: 520

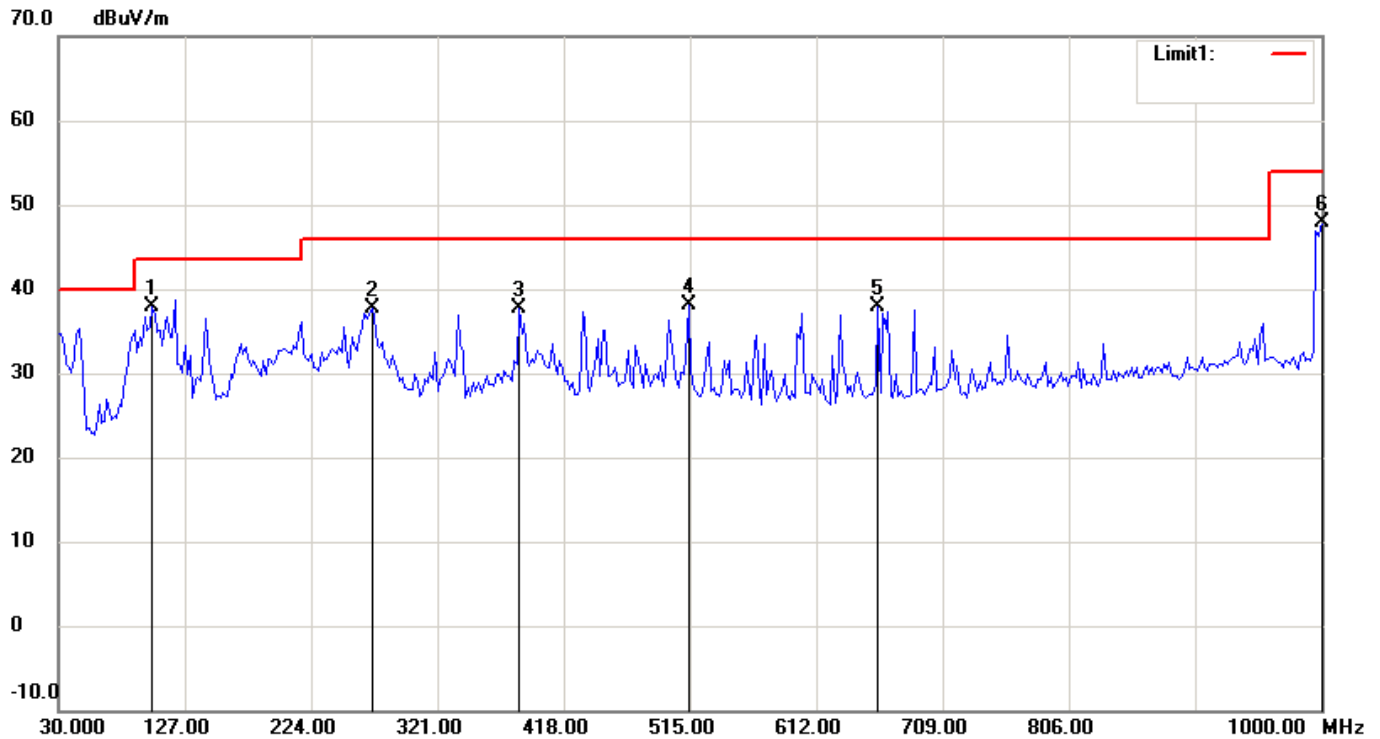
Data: #32

Date: 2009/6/18

Temperature: 28 °C

Time: PM 06:47:51

Humidity: 68 %



Condition: FCC Part 15B Class B

Polarization: Vertical

EUT:

Distance: 3m

Model:

Test Mode:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	101.9238	21.43	peak	16.45	37.88	43.50	-5.62	254	65
2	271.0421	19.42	peak	18.19	37.61	46.00	-8.39	254	330
3	383.7876	16.73	peak	20.96	37.69	46.00	-8.31	254	111
4	514.0281	14.53	peak	23.66	38.19	46.00	-7.81	254	39
5	659.8196	12.48	peak	25.41	37.89	46.00	-8.11	254	9
6	1000.0000	19.59	peak	28.33	47.92	54.00	-6.08	254	357

4.4.2.1.2 Emission frequencies above 1 GHz

Frequency (MHz)	Ant Pol H / V	Reading (dBuV) Peak	Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m) Peak AVG	Limit @3m (dBuV/m) Peak AVG	Margins (dB)
Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured.							

Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "****" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
 - $\pm 4.6\text{dB}$ ($30\text{MHz} \leq f < 300\text{MHz}$).
 - $\pm 4.4\text{dB}$ ($300\text{MHz} \leq f < 1000\text{MHz}$).
 - $\pm 4.1\text{dB}$ ($1\text{GHz} \leq f \leq 18\text{GHz}$).
 - $\pm 4.4\text{dB}$ ($18\text{GHz} < f \leq 40\text{GHz}$).
- 4 Remark "---" means that the emissions level is too low to be measured.

4.4.2.2 Operation Mode: RX

4.4.2.2.1 Emission frequencies below 1 GHz

File: 520

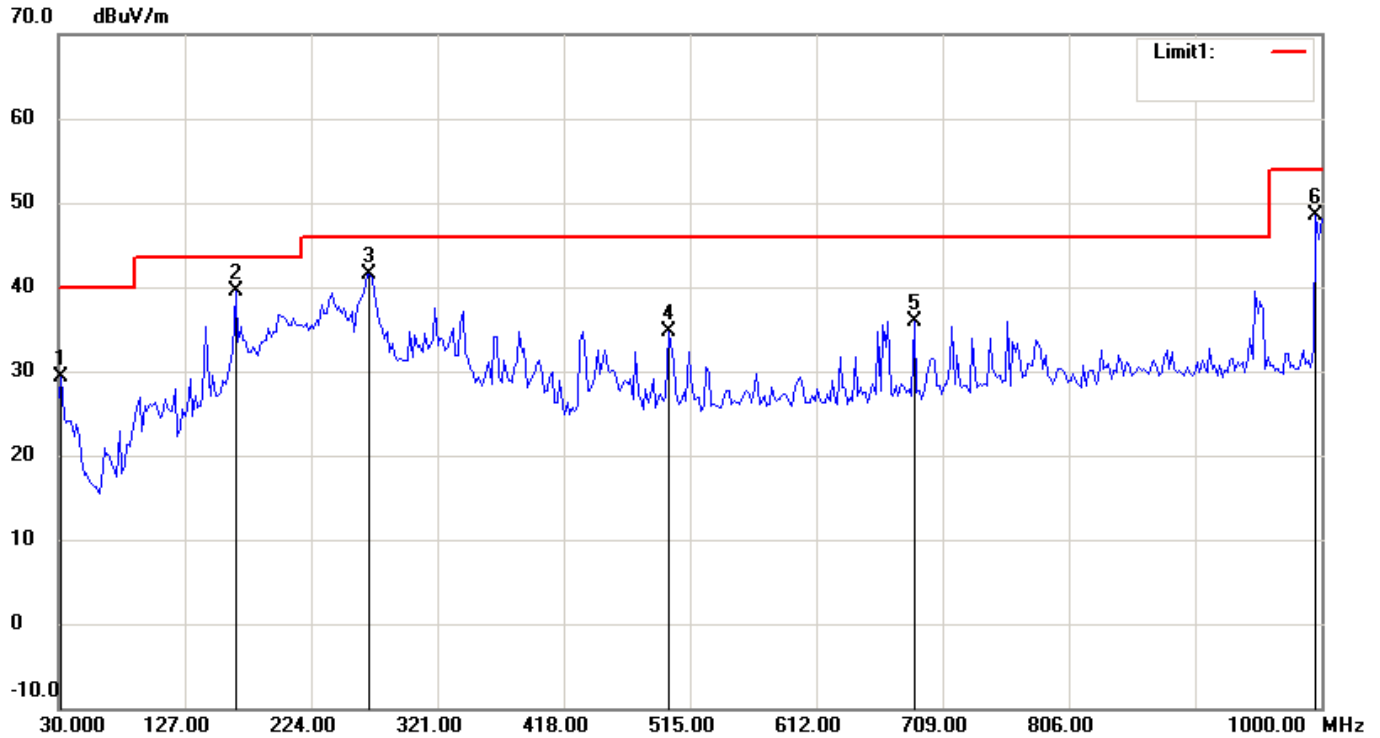
Data: #31

Date: 2009/6/18

Temperature: 28 °C

Time: PM 06:45:03

Humidity: 68 %



Condition: FCC Part 15B Class B

Polarization: Horizontal

EUT:

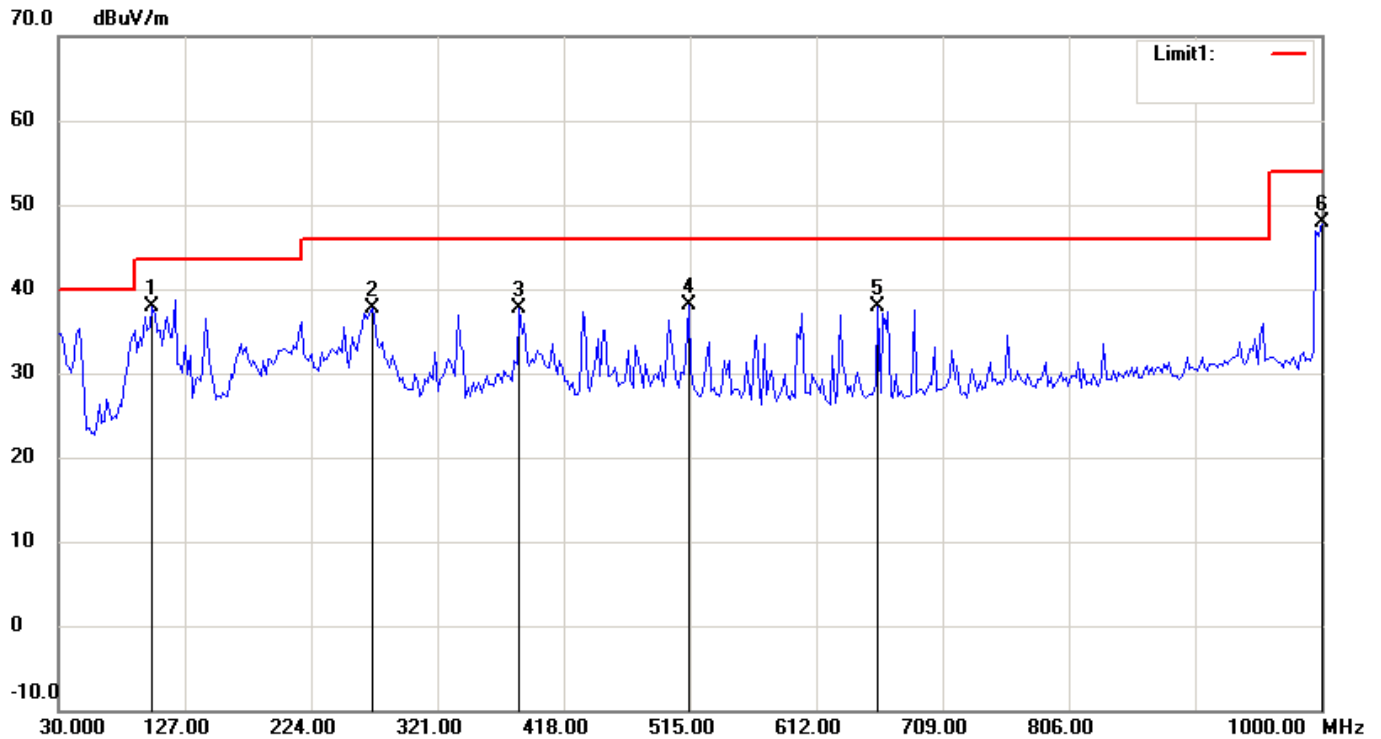
Distance: 3m

Model:

Test Mode:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	31.9439	6.28	peak	23.04	29.32	40.00	-10.68	254	116
2	166.0721	23.63	peak	15.82	39.45	43.50	-4.05	254	85
3	269.0982	23.26	peak	18.18	41.44	46.00	-4.56	254	226
4	498.4770	11.02	peak	23.60	34.62	46.00	-11.38	254	90
5	687.0341	10.49	peak	25.49	35.98	46.00	-10.02	254	277
6	996.1122	20.22	peak	28.25	48.47	54.00	-5.53	254	333

File: 520 Data: #32 Date: 2009/6/18 Temperature: 28 °C
Time: PM 06:47:51 Humidity: 68 %



Condition: FCC Part 15B Class B Polarization: Vertical
EUT: Distance: 3m
Model:
Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	101.9238	21.43	peak	16.45	37.88	43.50	-5.62	254	65
2	271.0421	19.42	peak	18.19	37.61	46.00	-8.39	254	330
3	383.7876	16.73	peak	20.96	37.69	46.00	-8.31	254	111
4	514.0281	14.53	peak	23.66	38.19	46.00	-7.81	254	39
5	659.8196	12.48	peak	25.41	37.89	46.00	-8.11	254	9
6	1000.0000	19.59	peak	28.33	47.92	54.00	-6.08	254	357

4.4.2.2.2 Emission frequencies above 1 GHz

Frequency (MHz)	Ant Pol H / V	Reading (dBuV) Peak	Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m) Peak AVG	Limit @3m (dBuV/m) Peak AVG	Margins (dB)
Radiated emission frequencies above 1 GHz to 25 GHz were too low to be measured.							

Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "****" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
 - $\pm 4.6\text{dB}$ ($30\text{MHz} \leq f < 300\text{MHz}$).
 - $\pm 4.4\text{dB}$ ($300\text{MHz} \leq f < 1000\text{MHz}$).
 - $\pm 4.1\text{dB}$ ($1\text{GHz} \leq f \leq 18\text{GHz}$).
 - $\pm 4.4\text{dB}$ ($18\text{GHz} < f \leq 40\text{GHz}$).
- 4 Remark "---" means that the emissions level is too low to be measured.

4.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies4.4.3.1 Operation Mode: GFSK

(A)

Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Jun. 18, 2009

Temperature : 28°C

Humidity : 68%

Frequency (MHz)	Reading (dBUV)				Factor (dB) Corr.	Result @3m (dBUV/m)		Limit @3m (dBUV/m)	
	H		V			Peak (H/V Max.)	Ave	Peak	Ave.
	Peak	Ave	Peak	Ave					
2390.000	24.57	16.58	26.35	18.52	30.3	56.65	48.82	74.0	54.0

Note:

The result is the highest value of radiated emission from restrict band of 2310 ~2390 MHz.

(B)

Channel 78

Operation Mode : Transmitting

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V			Peak Peak	Ave Ave (H/V Max.)	Peak	Ave.
	Peak	Ave	Peak	Ave					
2483.500	24.36	16.42	26.21	18.37	30.3	56.51	48.67	74.0	54.0

Note:

The result is the highest value of radiated emission from restrict band of 2483.5 ~2500 MHz.

4.4.3.2 Operation Mode: 8DPSK

(A)

Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Jun. 18, 2009

Temperature : 28°C

Humidity : 68%

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave (H/V Max.)		Limit @3m (dBuV/m) Peak Ave.	
	H Peak	V Ave	H Peak	V Ave		Peak	Ave	Peak	Ave.
2390.000	24.13	17.21	26.54	18.78	30.3	56.84	49.08	74.0	54.0

Note:

The result is the highest value of radiated emission from restrict band of 2310 ~2390 MHz.

(B)

Channel 78

Operation Mode : Transmitting

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV)				Factor (dB) Corr.	Result @3m (dBuV/m) Peak Ave (H/V Max.)		Limit @3m (dBuV/m) Peak Ave.	
	H Peak	V Ave	H Peak	V Ave		Peak	Ave	Peak	Ave.
2483.500	24.96	17.33	26.58	18.41	30.3	56.88	48.71	74.0	54.0

Note:

The result is the highest value of radiated emission from restrict band of 2483.5 ~2500 MHz.

4.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

$$\text{Result} = \text{Reading} + \text{Corrected Factor}$$

where

$$\text{Corrected Factor} = \text{Antenna Factor} + \text{Cable Loss} + \text{High Pass Filter Loss} - \text{Amplifier Gain}$$

5 CONDUCTED EMISSION MEASUREMENT

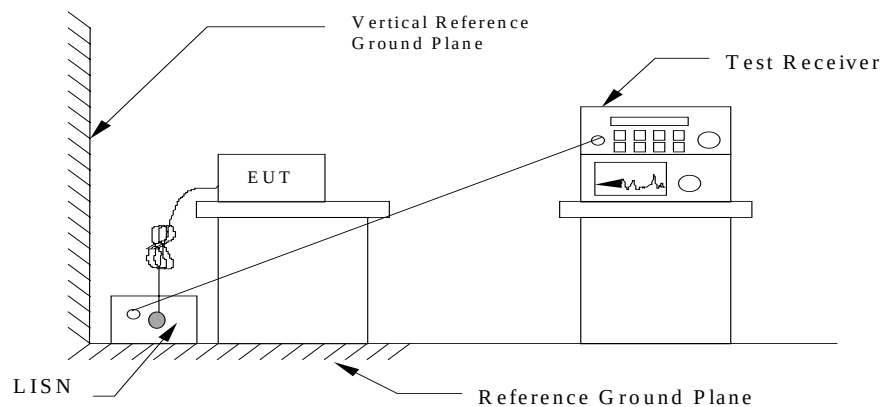
5.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and §15.207(a) respectively. Both Limits are identical specification.

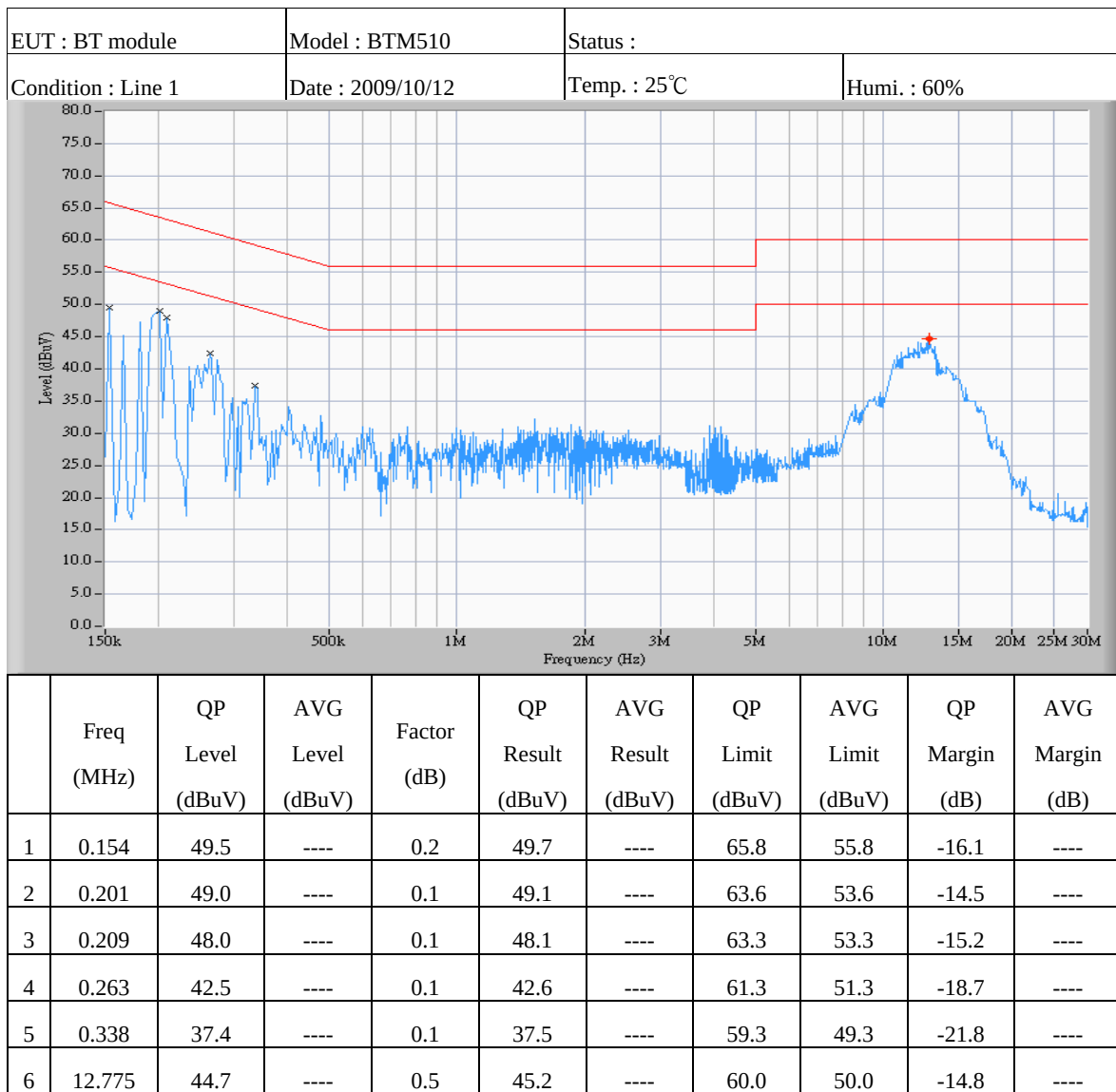
5.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration

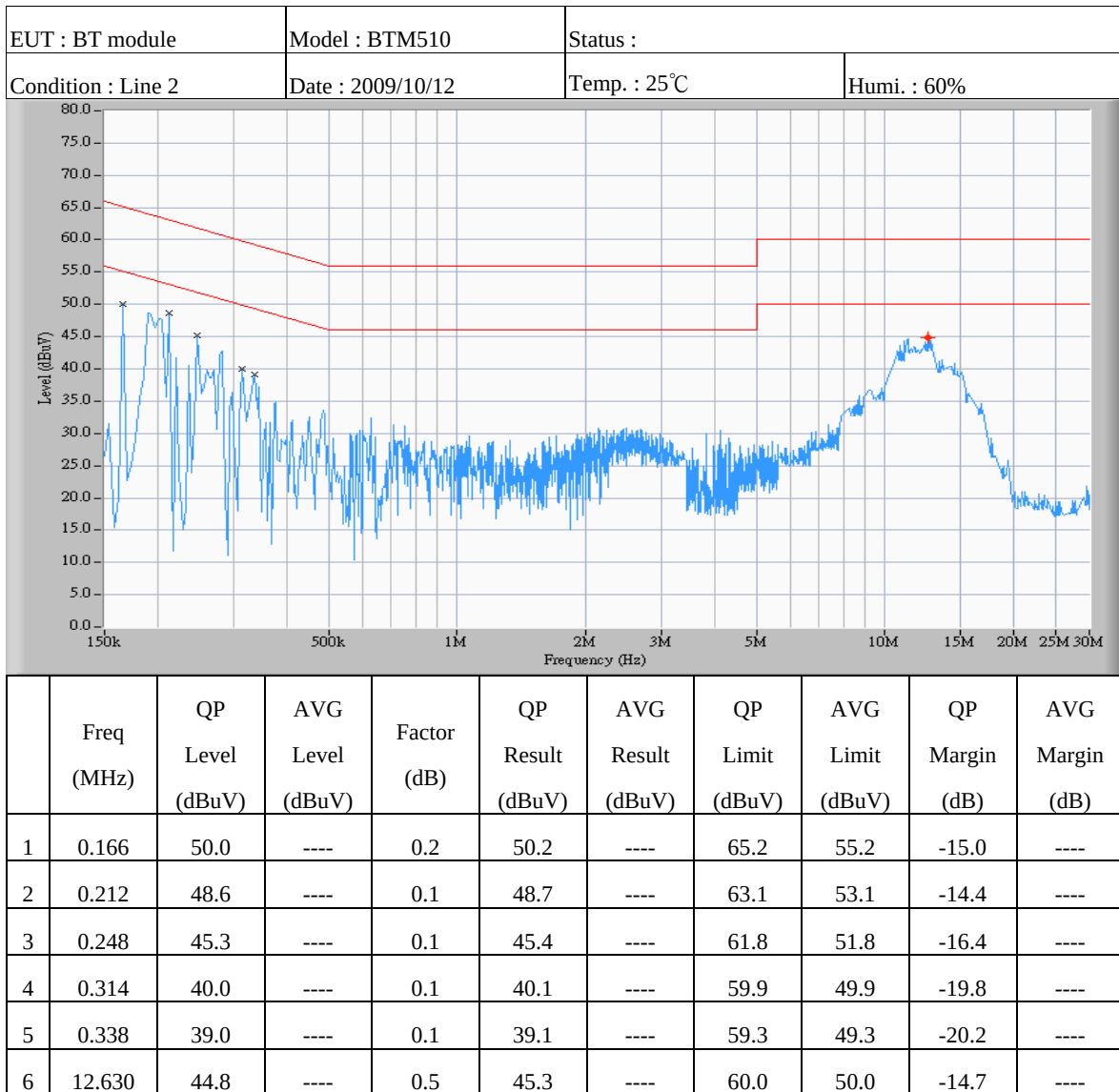


5.3 Conducted Emission Data



Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of “----” means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.



Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of “----” means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.

5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

$$\textbf{RESULT} = \textbf{READING} + \textbf{LISN FACTOR (Included Cable Loss)}$$

5.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

Equipment	Manufacturer	Model No.	Next Cal. Due
RF Test Receiver	Rohde and Schwarz	ESCS30	08/22/2010
LISN	EMCO	37100/2M	02/11/2010

6 ANTENNA REQUIREMENT

6.1 Standard Applicable

For intentional device, according to §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 §15.247 (b), if Receiving 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.

6.2 Antenna Construction and Directional Gain

The antennas is a Monopole antenna. The peak gain of antenna used is 0 dBi.

7 20dB EMISSION BANDWIDTH MEASUREMENT

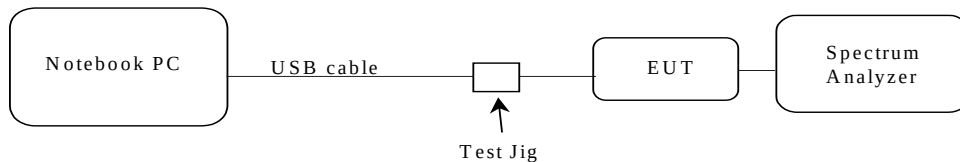
7.1 Standard Applicable

According to 15.247(a)(1), for frequency hopping systems, hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

7.2 Measurement Procedure

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

Figure 4: Emission bandwidth measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

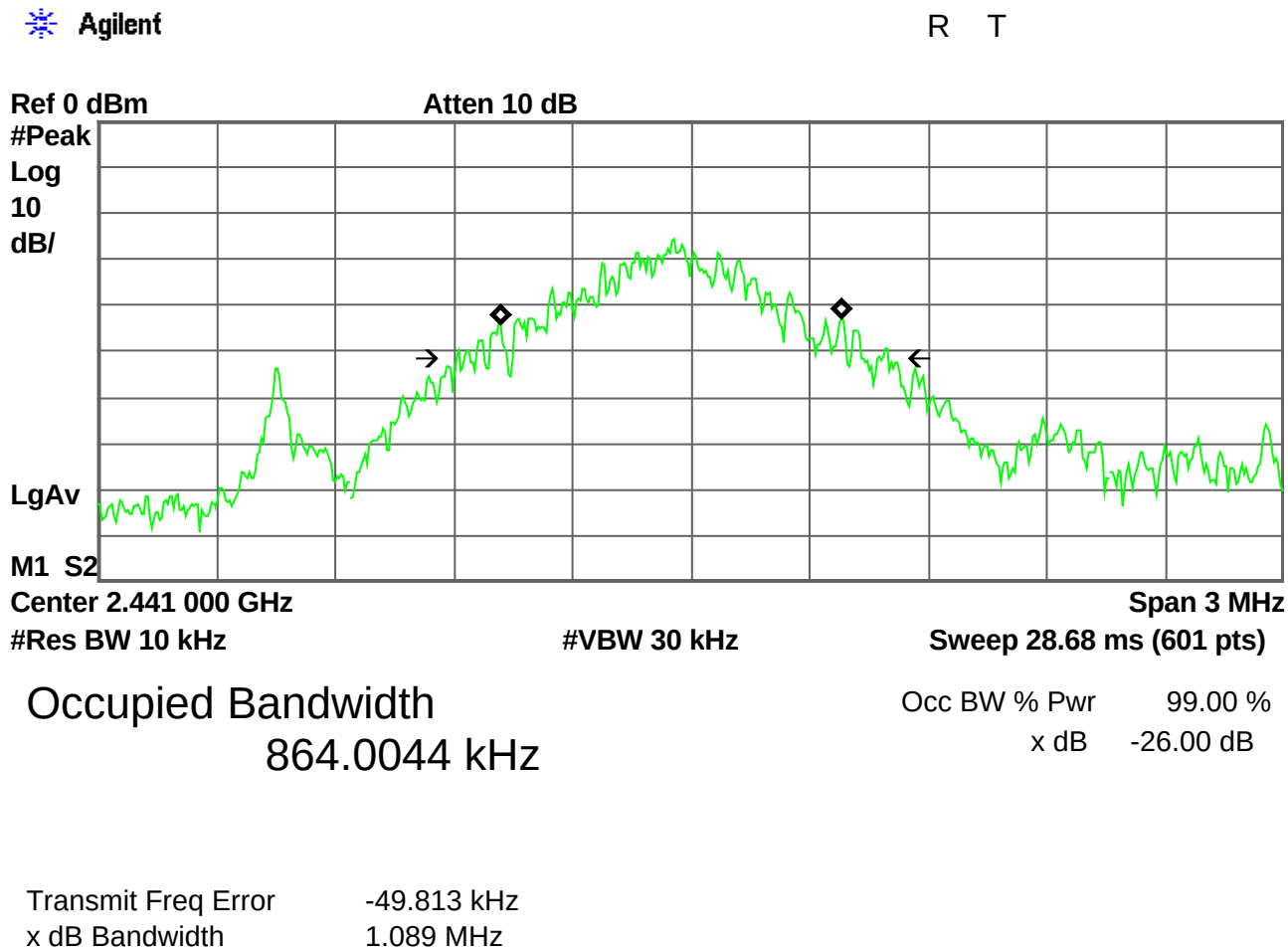
7.4 Measurement Data

7.4.1 Operation Mode: GFSK

Test Date : Jun. 11, 2009 Temperature : 28°C Humidity : 59%

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Chart
0	2402	0.85	Page 32
39	2441	0.87	Page 33
78	2480	0.83	Page 34

Note: Please refer to page 32 to page 34 for chart.



File: BTM510

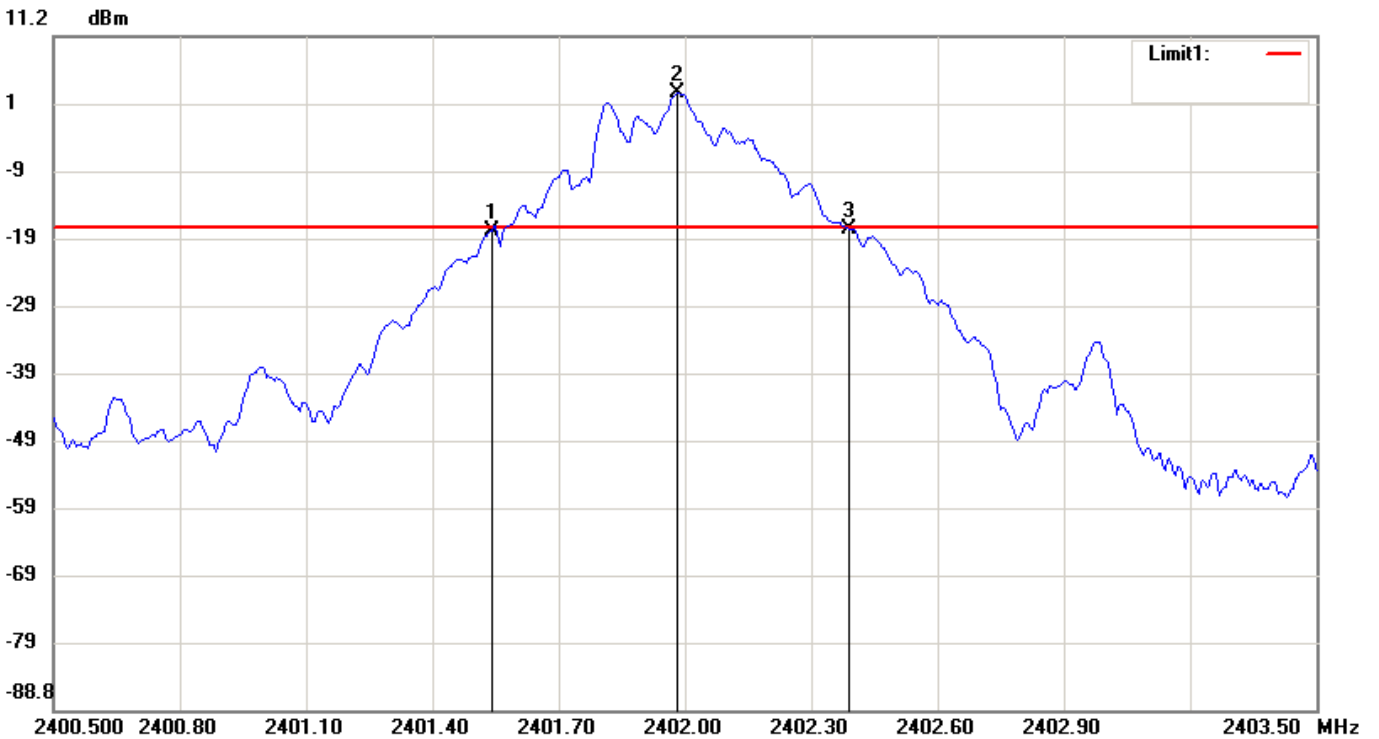
Data: #3

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:20:01

Humidity: 59 %



Condition: -17.3dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 3.2ms Att.: 20dB

Model: BTM510

RBW: 30 KHz VBW: 100 KHz

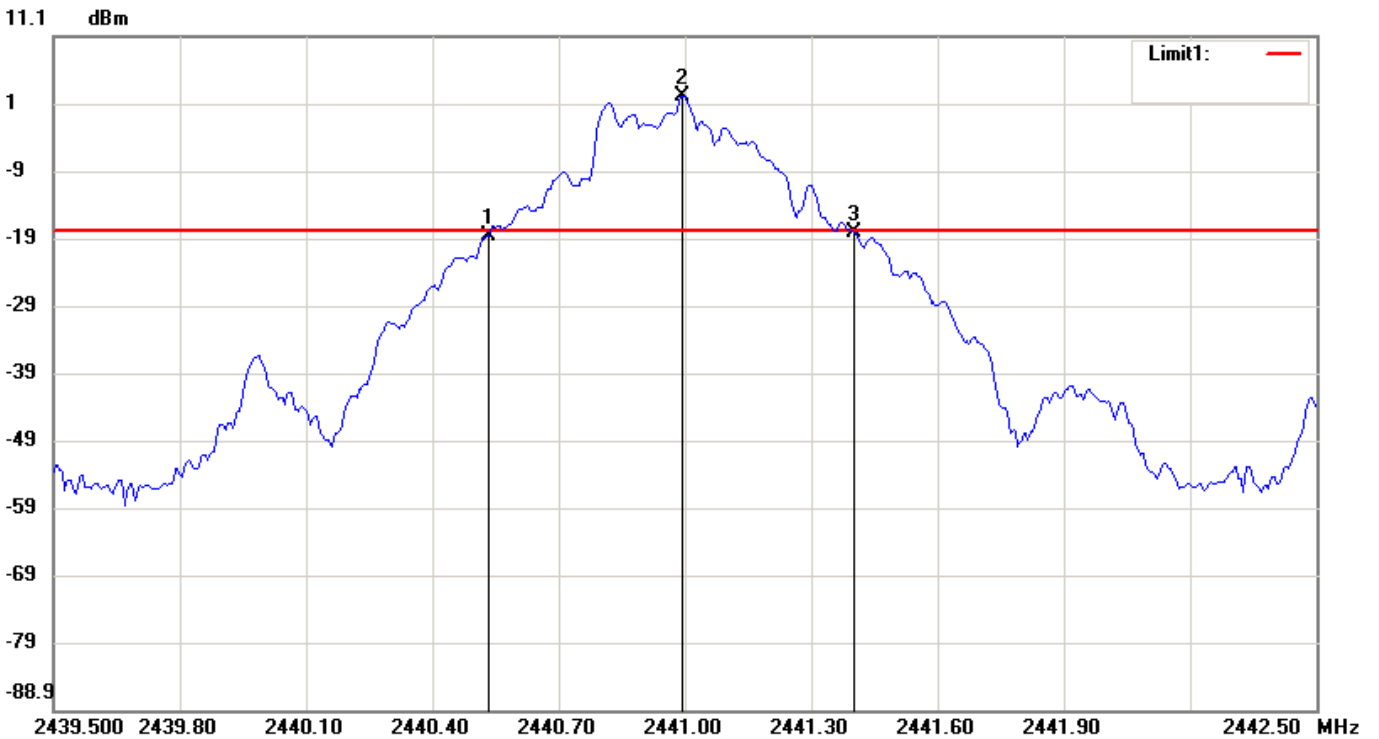
Test Mode:

Note: FCC-Bluetooth Channel 00-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2401.5400	-17.66
2	2401.9800	2.70
3	2402.3900	-17.53

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	0.85	0.13

File: BTM510 Data: #17 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:35:58 Humidity: 59 %

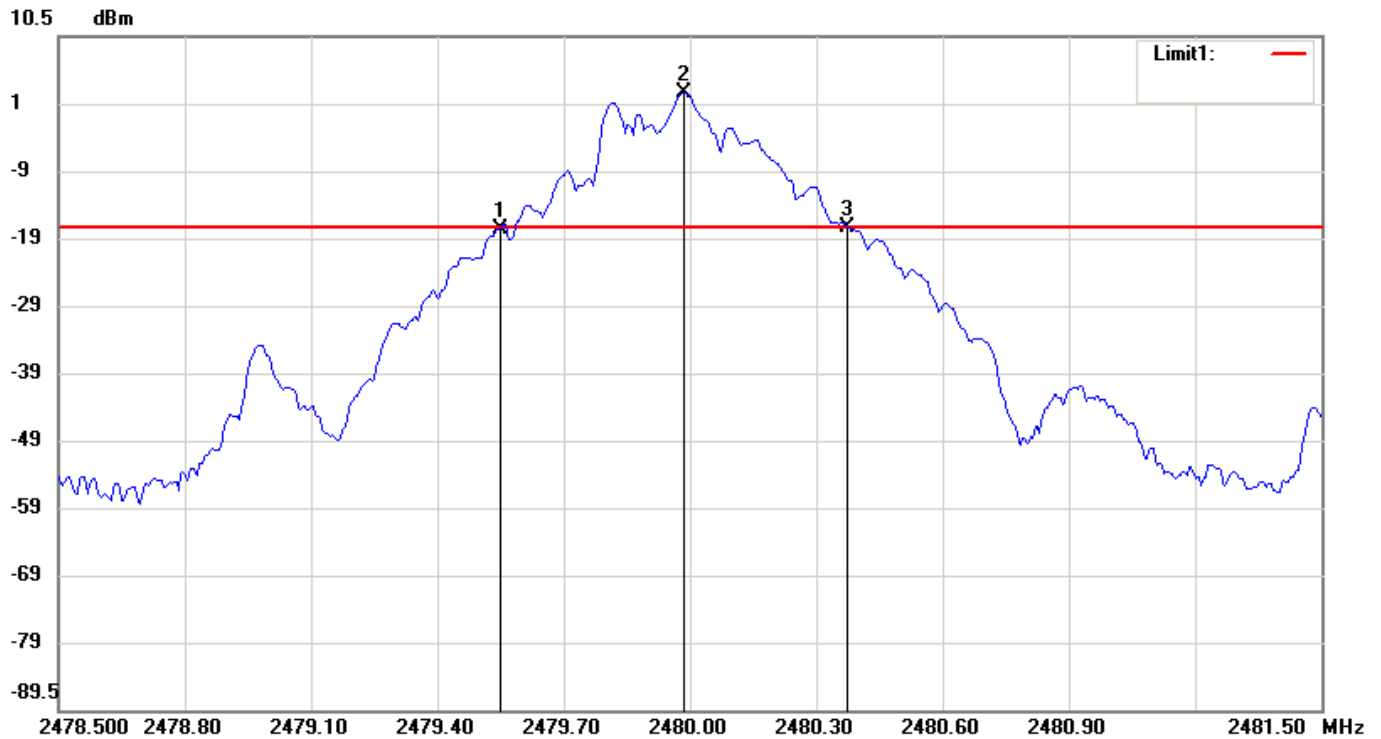


Condition: -17.71dBm Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 20dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Channel 39-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2440.5350	-18.48
2	2440.9950	2.29
3	2441.4000	-17.98

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	0.865	0.5

File: BTM510 Data: #10 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:26:03 Humidity: 59 %



Condition: -17.86dBm Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 20dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Channel 78-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2479.5500	-18.14
2	2479.9850	2.14
3	2480.3750	-17.93

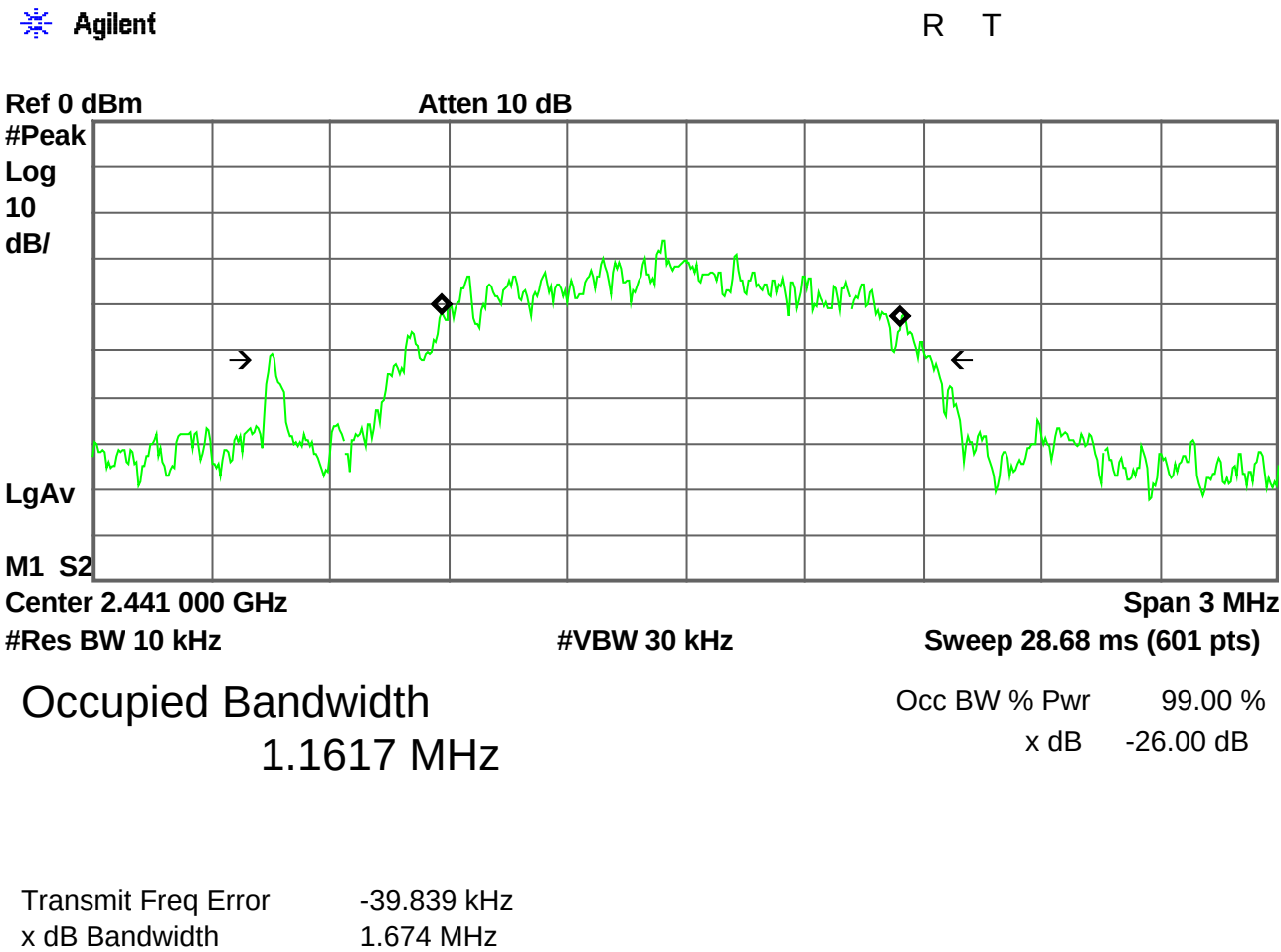
No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	0.825	0.21

7.4.2 Operation Mode: 8DPSK

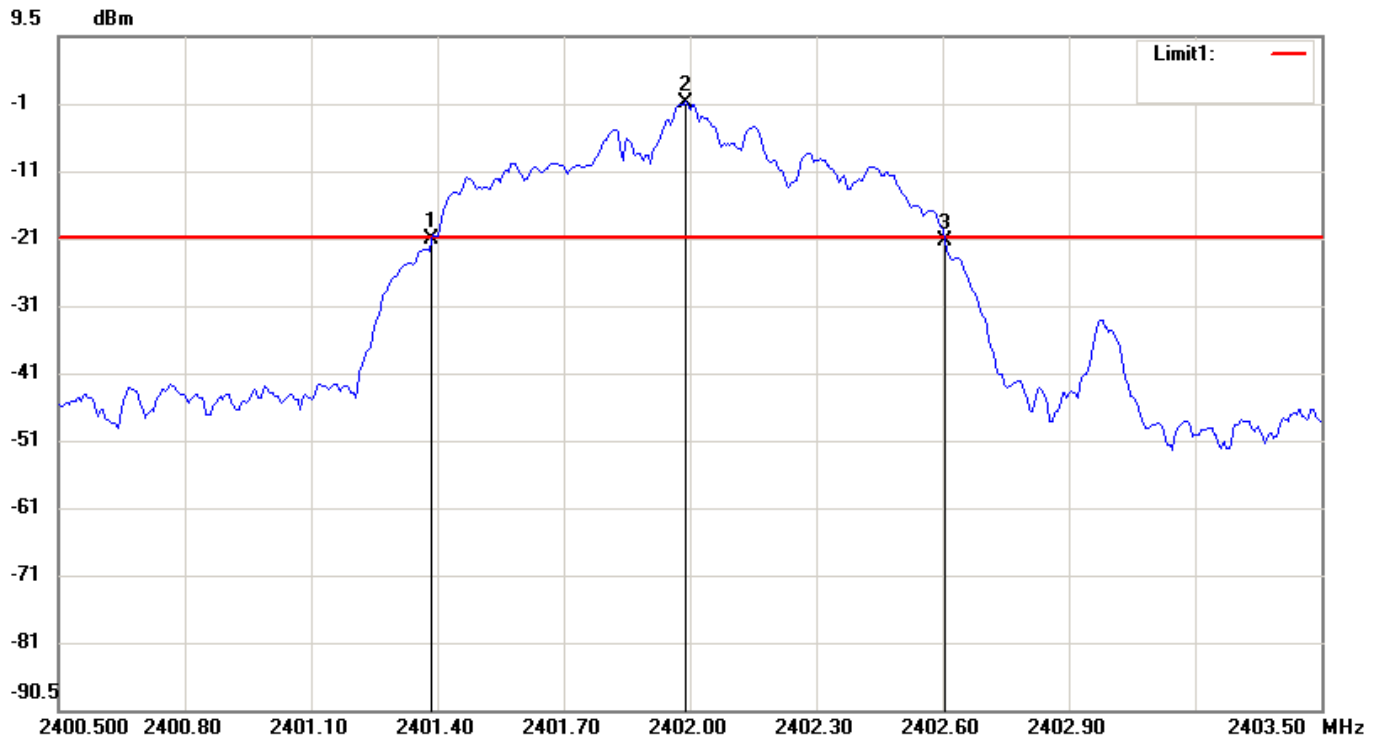
Test Date : Jun. 11, 2009 Temperature : 28°C Humidity : 59%

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Chart
0	2402	1.22	Page 36
39	2441	1.22	Page 37
78	2480	1.22	Page 38

Note: Please refer to page 36 to page 38 for chart.



File: BTM510 Data: #34 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:54:55 Humidity: 59 %

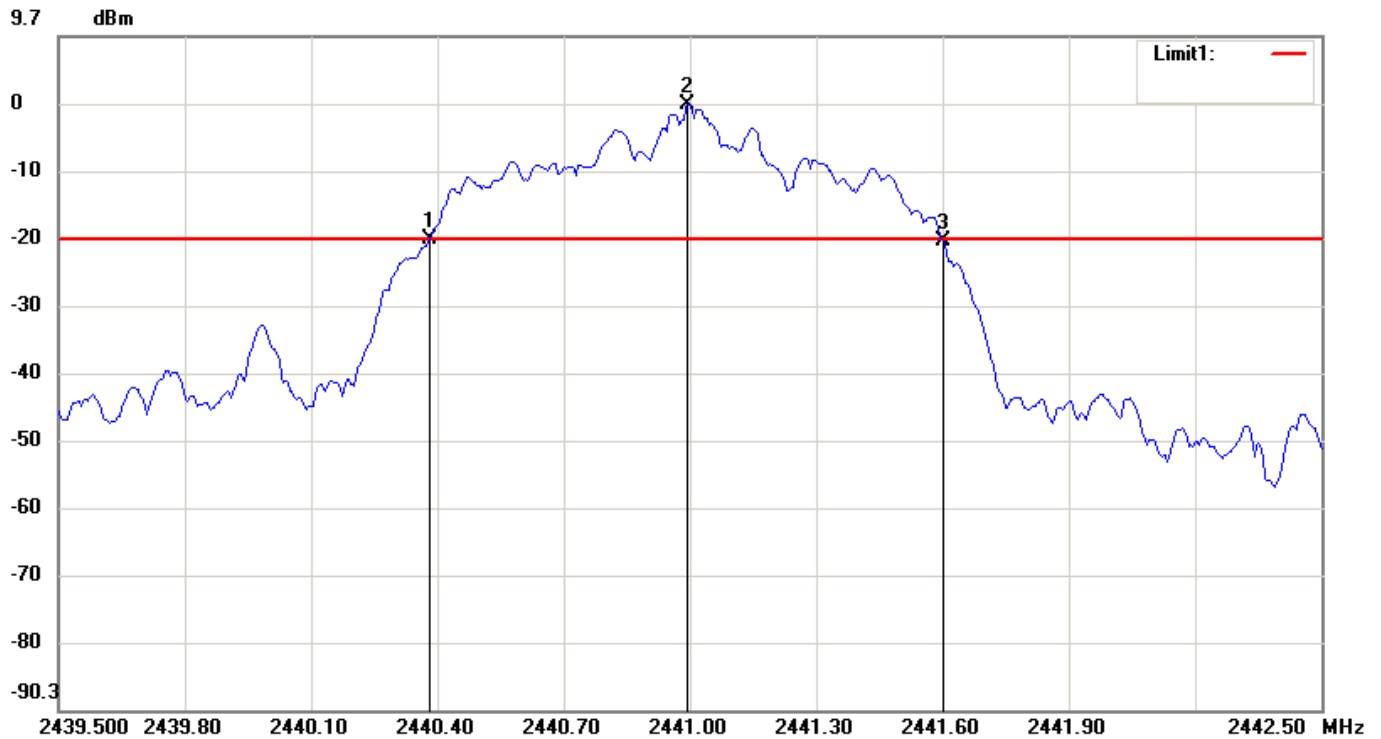


Condition: -20.27dBm Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 10dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Channel 00-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2401.3850	-20.68
2	2401.9900	-0.27
3	2402.6050	-20.93

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	1.22	-0.25

File: BTM510 Data: #48 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:07:19 Humidity: 59 %

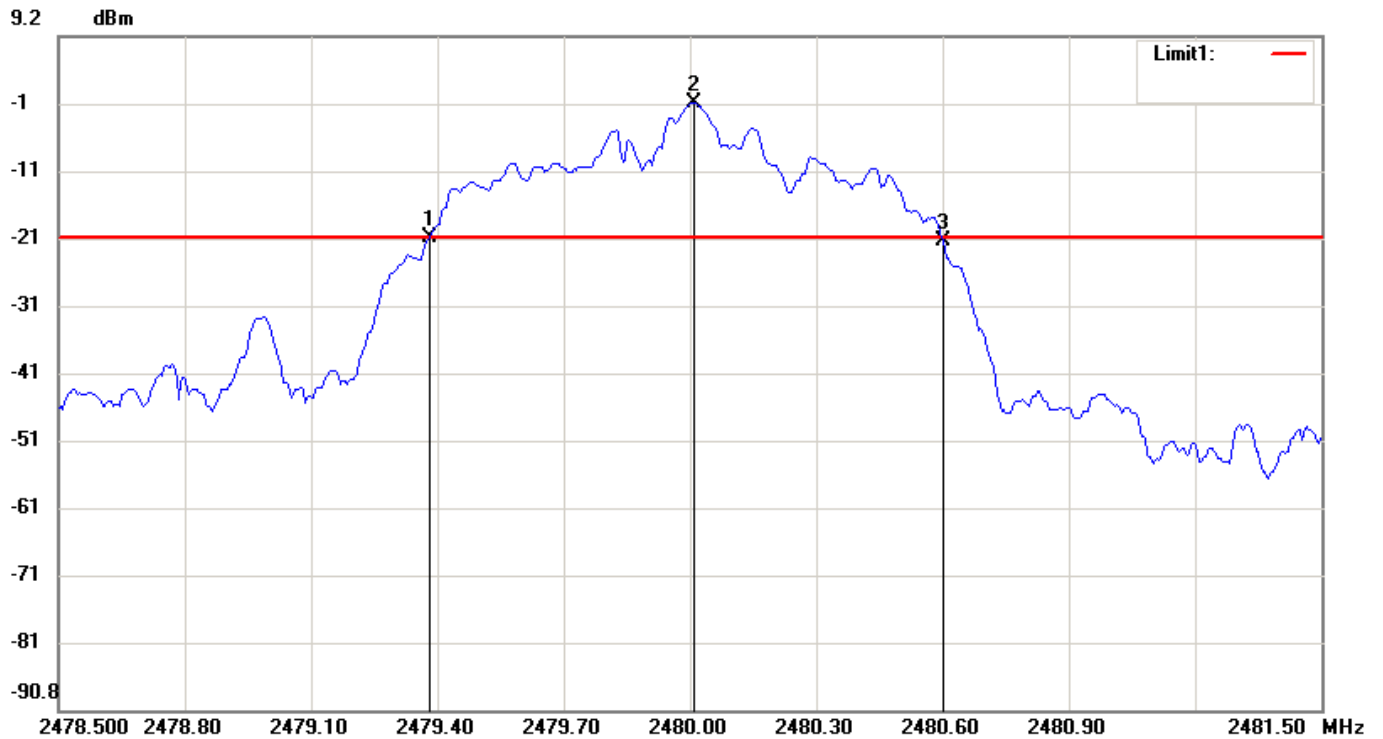


Condition: -20.3dBm Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 10dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Channel 39-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2440.3800	-20.50
2	2440.9950	-0.30
3	2441.6000	-20.54

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	1.22	-0.04

File: BTM510 Data: #41 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:02:24 Humidity: 59 %



Condition: -20.71dBm Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 10dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Channel 78-20dB EBW

No.	Frequency(MHz)	Level(dBm)
1	2479.3800	-20.77
2	2480.0100	-0.71
3	2480.6000	-21.23

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	1.22	-0.46

8 OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For frequency hopping system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If Receiving 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.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 2 MHz and VBW to 2 MHz.
4. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
5. Repeat above procedures until all frequencies measured were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

8.4 Measurement Data

8.4.1 Operation Mode: GFSK

Test Date : Jun. 11, 2009

Temperature : 28°C

Humidity : 59%

Channel	Frequency (MHz)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
0	2402	2.81	1.91	1000	Page 41
39	2441	2.82	1.91	1000	Page 42
78	2480	2.18	1.65	1000	Page 43

Note: 1. Please refer to page 41 to page 43 for chart.

2. Instrument have compensation for factor of result.

File: BTM510

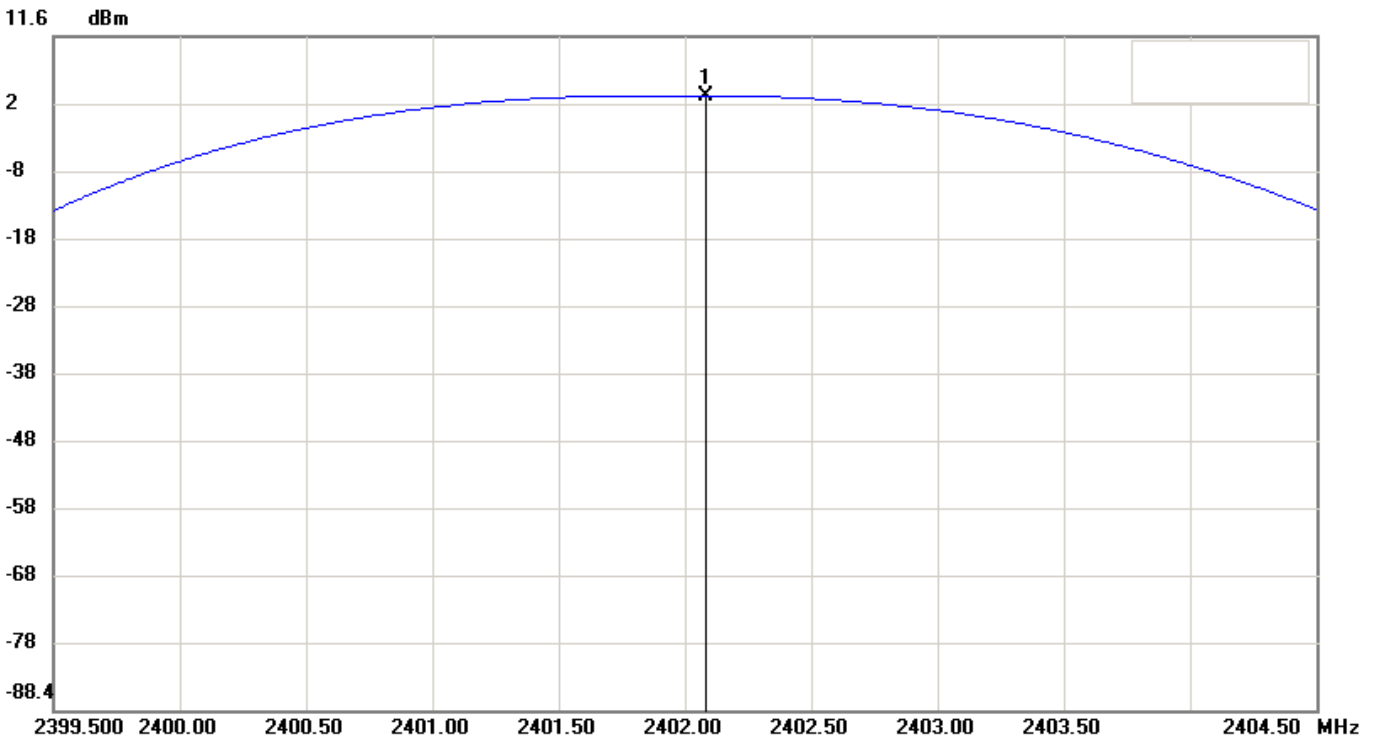
Data: #1

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:19:13

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC Bluetooth CH00 Output Power

Horizontal

Sweep Time: 1ms Att.: 20dB

RBW: 2000 KHz VBW: 2000 KHz

No.	Frequency(MHz)	Level(dBm)
1	2402.0833	2.81

File: BTM510

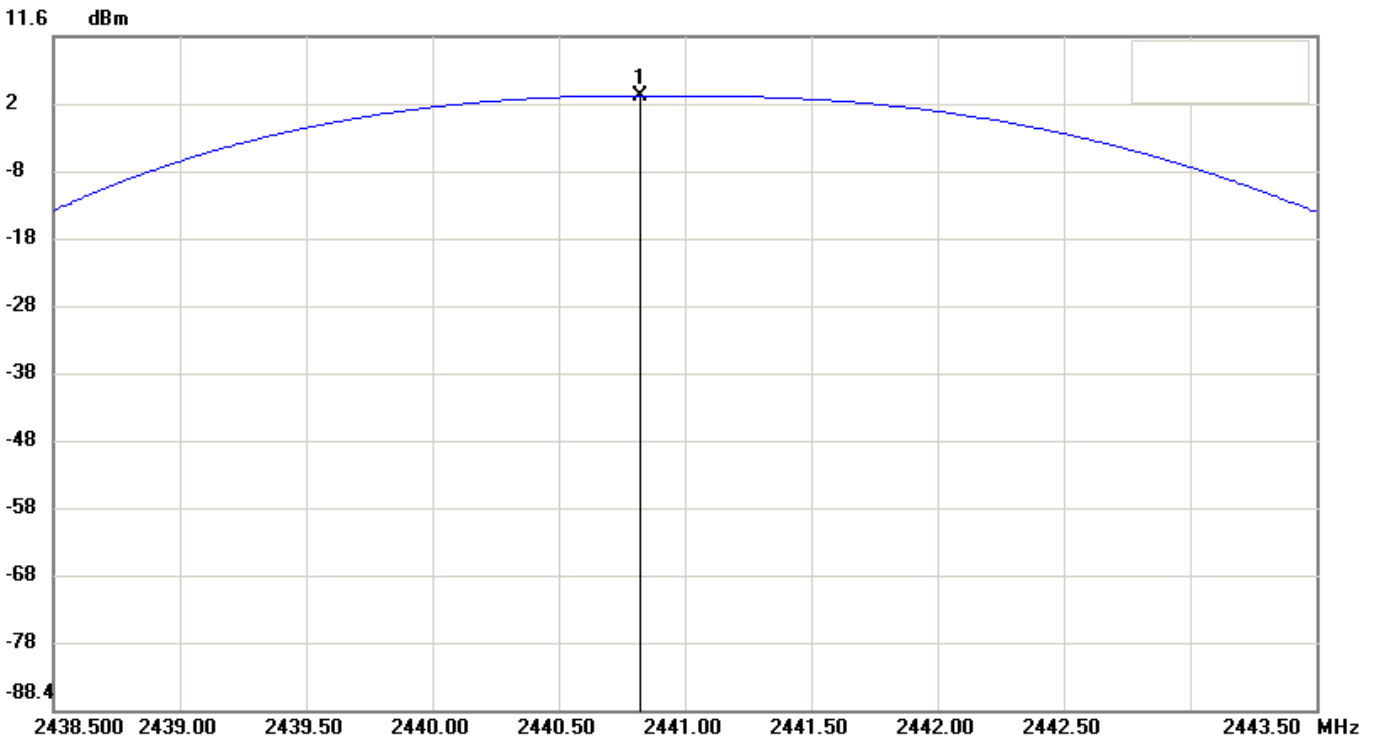
Data: #15

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:35:15

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC Bluetooth CH39 Output Power

Horizontal

Sweep Time: 1ms Att.: 20dB

RBW: 2000 KHz VBW: 2000 KHz

No.	Frequency(MHz)	Level(dBm)
1	2440.8250	2.82

File: BTM510

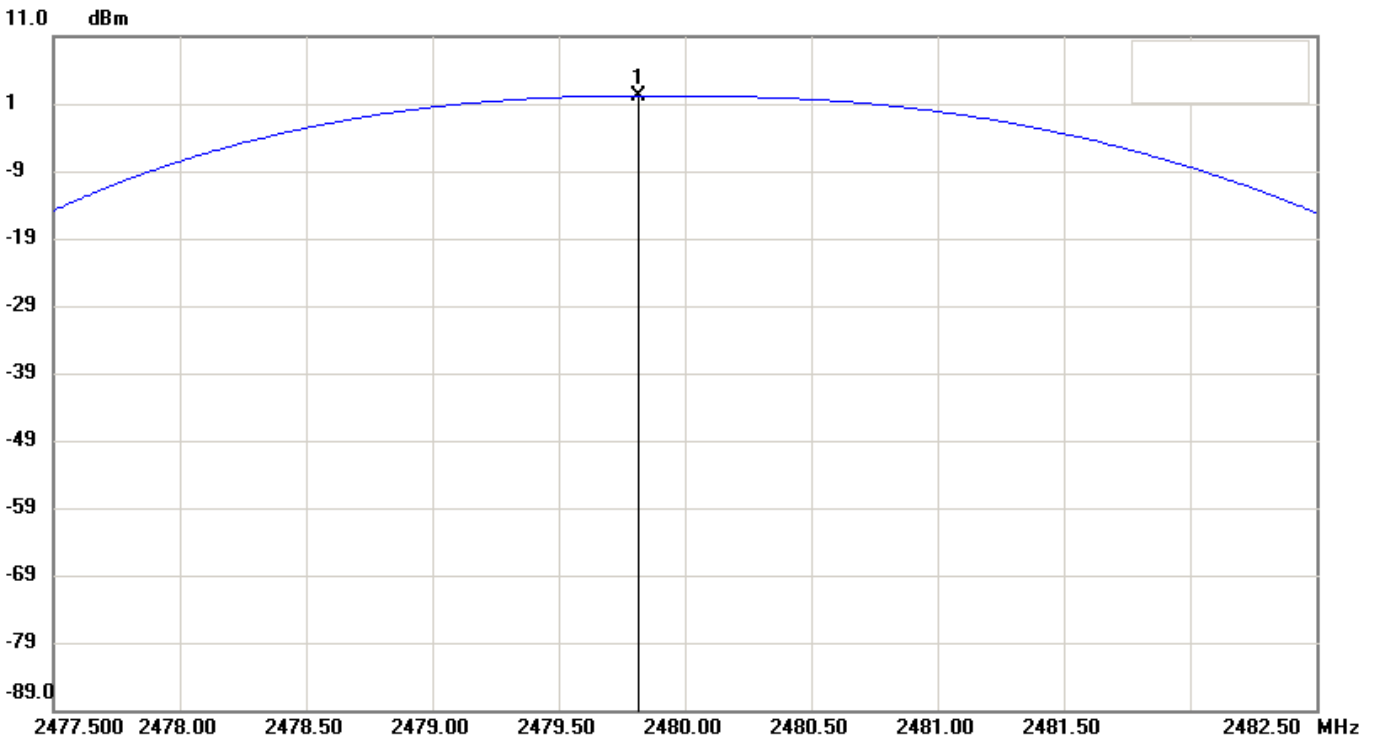
Data: #8

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:25:19

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC Bluetooth CH78 Output Power

Horizontal

Sweep Time: 1ms Att.: 20dB

RBW: 2000 KHz VBW: 2000 KHz

No.	Frequency(MHz)	Level(dBm)
1	2479.8167	2.18

8.4.2 Operation Mode: 8DPSK

Test Date : Jun. 11, 2009

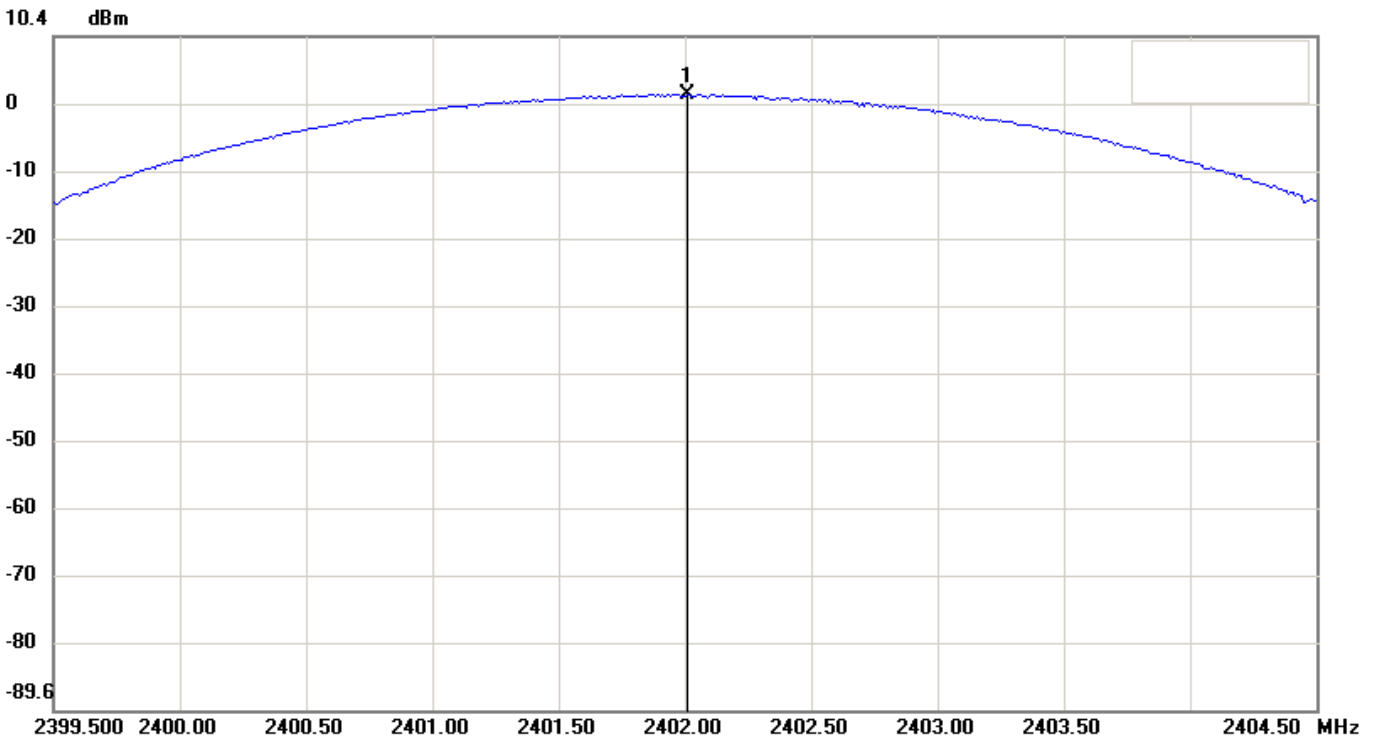
Temperature : 28°C

Humidity : 59%

Channel	Frequency (MHz)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
0	2402	1.78	1.51	1000	Page 45
39	2441	1.83	1.52	1000	Page 46
78	2480	1.15	1.30	1000	Page 47

Note: 1. Please refer to page 45 to page 47 for chart.***2. Instrument have compensation for factor of result.***

File: BTM510 Data: #32 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:54:11 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 1ms Att.: 20dB
Model: BTM510 RBW: 2000 KHz VBW: 2000 KHz
Test Mode:
Note: FCC Bluetooth CH00 Output Power

No.	Frequency(MHz)	Level(dBm)
1	2402.0083	1.78

File: BTM510

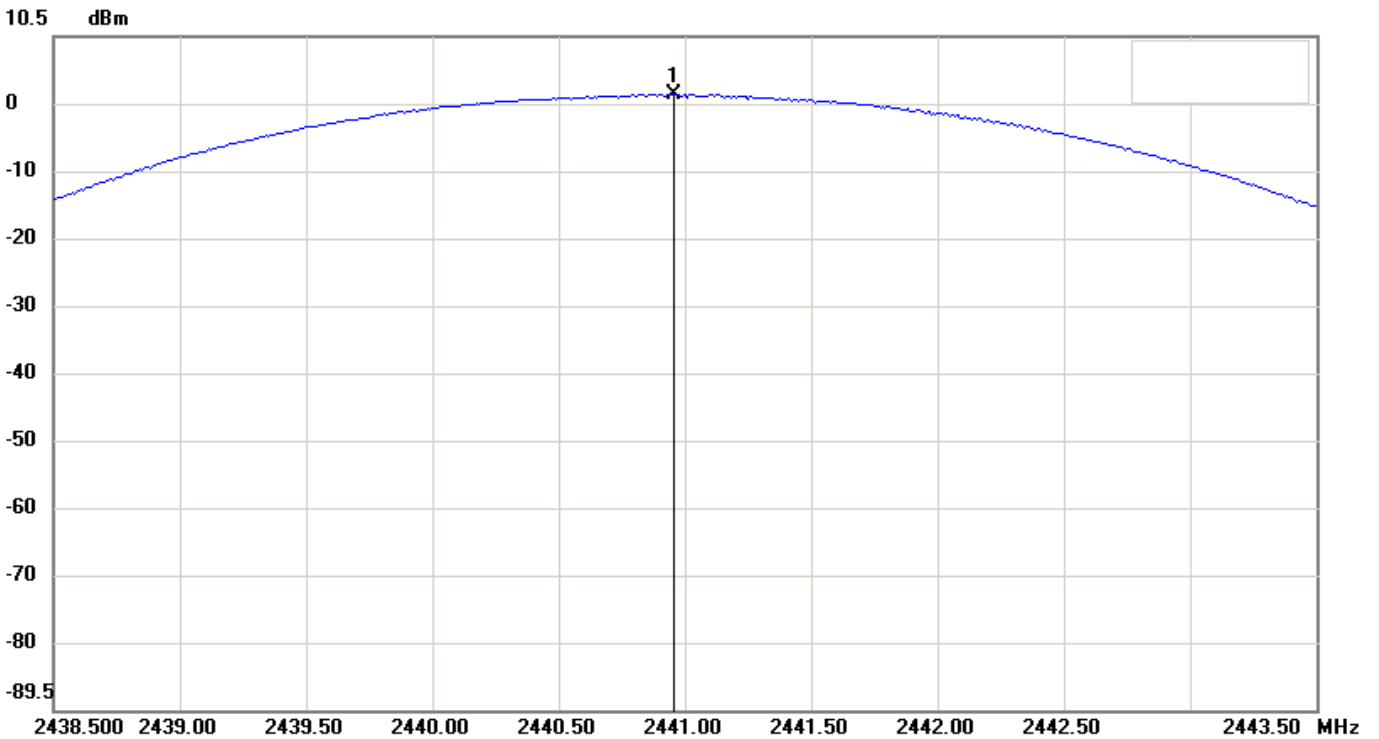
Data: #46

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:06:37

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC Bluetooth CH39 Output Power

Horizontal

Sweep Time: 1ms Att.: 20dB

RBW: 2000 KHz VBW: 2000 KHz

No.	Frequency(MHz)	Level(dBm)
1	2440.9583	1.83

File: BTM510

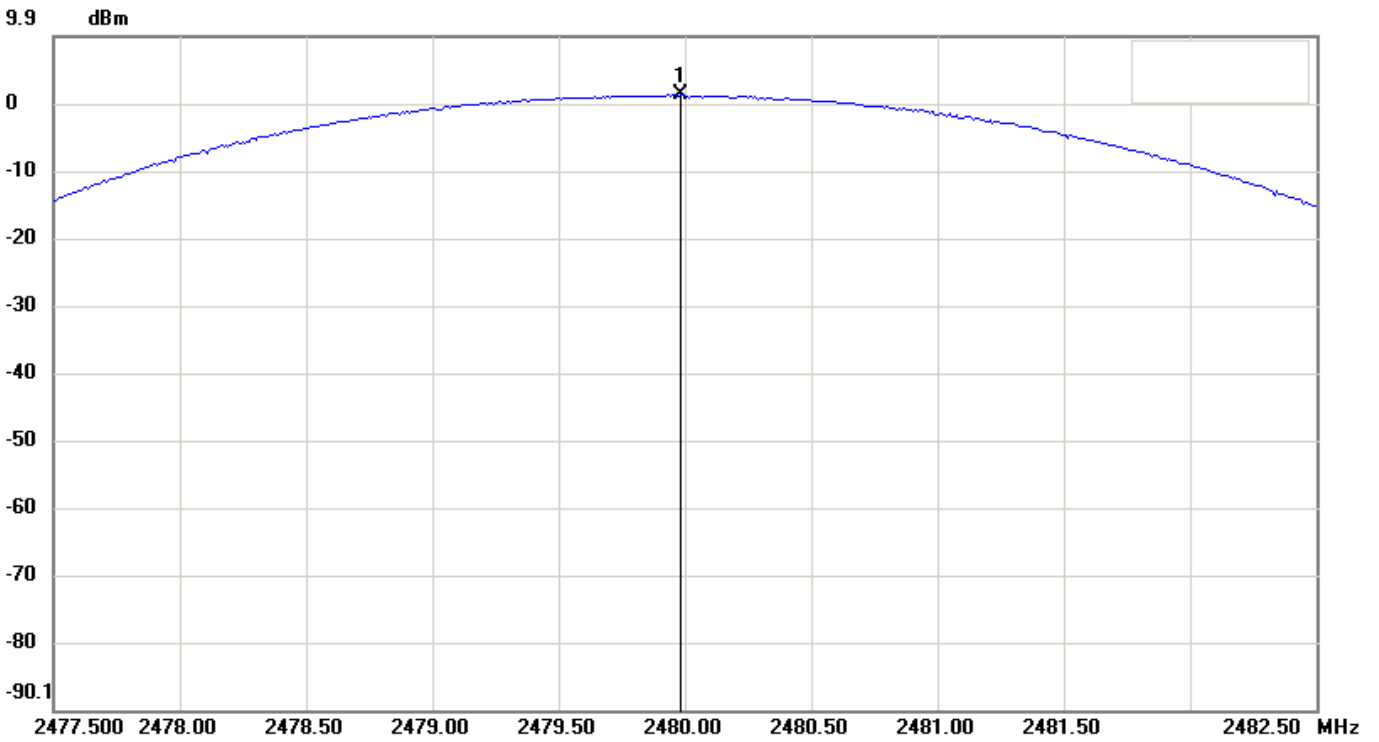
Data: #39

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:01:41

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC Bluetooth CH78 Output Power

Horizontal

Sweep Time: 1ms Att.: 10dB

RBW: 2000 KHz VBW: 2000 KHz

No.	Frequency(MHz)	Level(dBm)
1	2479.9833	1.15

9 OUT-OF-BAND RF CONDUCTED SPURIOUS EMISSION MEASUREMENT

9.1 Standard Applicable

According to 15.247(c), if any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in §15.209(a), whichever results in the lesser attenuation.

9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

9.4 Measurement Data

9.4.1 Operation Mode: GFSK

Test Date : Jun. 11, 2009

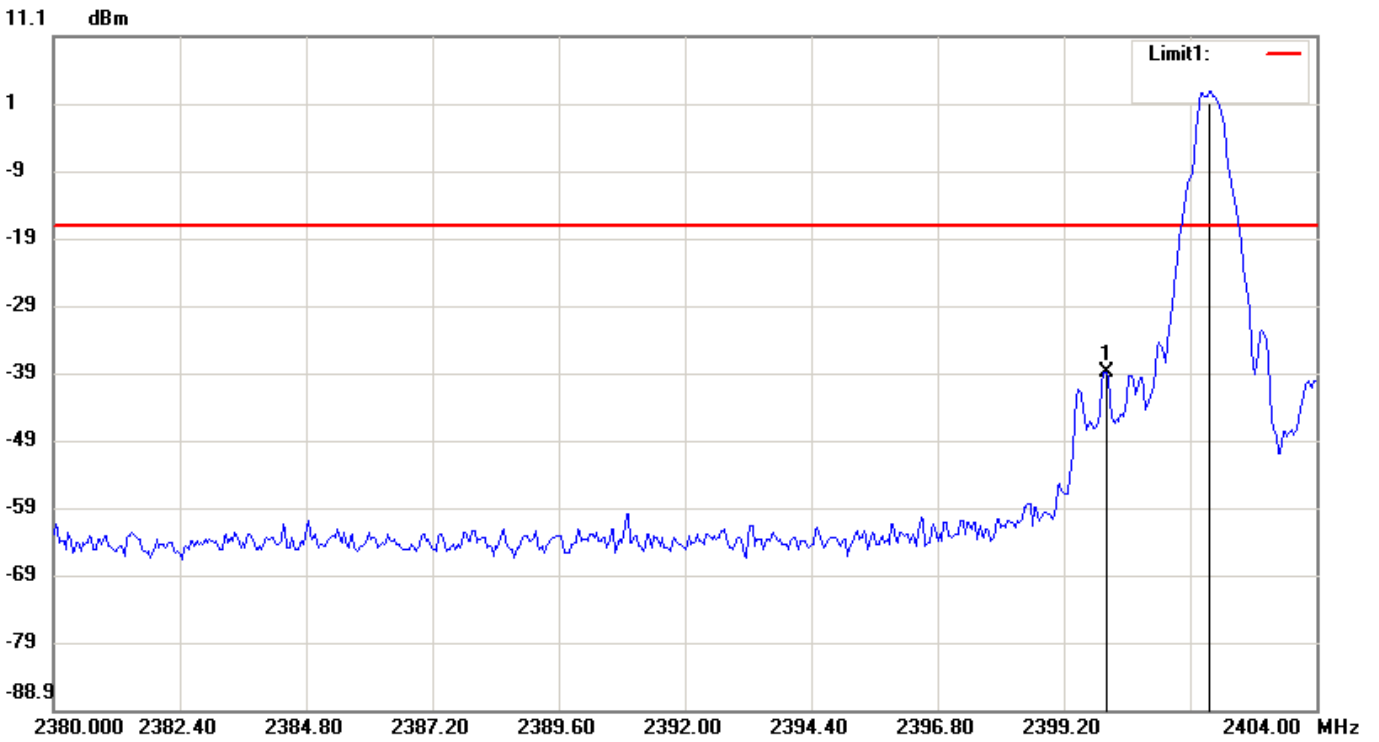
Temperature : 28°C

Humidity : 59%

Channel	Test Frequency Range	Note	Chart
0	2350 MHz - 2450 MHz	Lower Band Edge	Page 50
78	2433.5 MHz - 2533.5 MHz	Upper Band Edge	Page 51
0	30 MHz - 25 GHz		Page 52
39	30 MHz - 25 GHz		Page 53
78	30 MHz - 25 GHz		Page 54

Note: Please refer to page 50 to page 54 for chart.

File: BTM510 Data: #6 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:21:23 Humidity: 59 %



Condition: -17.09dBm Horizontal
EUT: Bluetooth module Sweep Time: 2.32ms Att.: 20dB
Model: BTM510 RBW: 100 KHz VBW: 300 KHz
Test Mode:
Note: FCC-Bluetooth Channel 00-Bandedge (Fixed)

No.	Frequency(MHz)	Level(dBm)
1	2400.0000	-38.82
2	2401.9600	2.91

File: BTM510

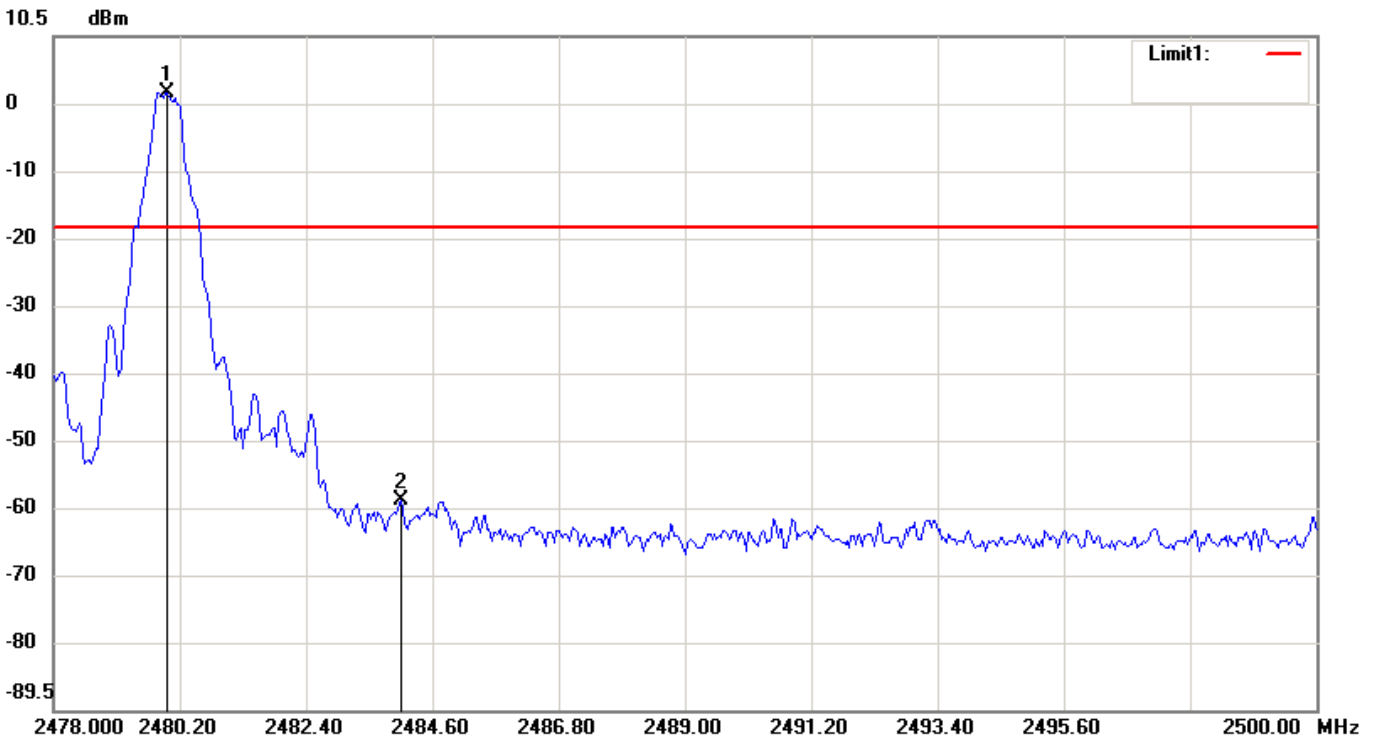
Data: #13

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:27:25

Humidity: 59 %



Condition: -17.83dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2.12ms Att.: 20dB

Model: BTM510

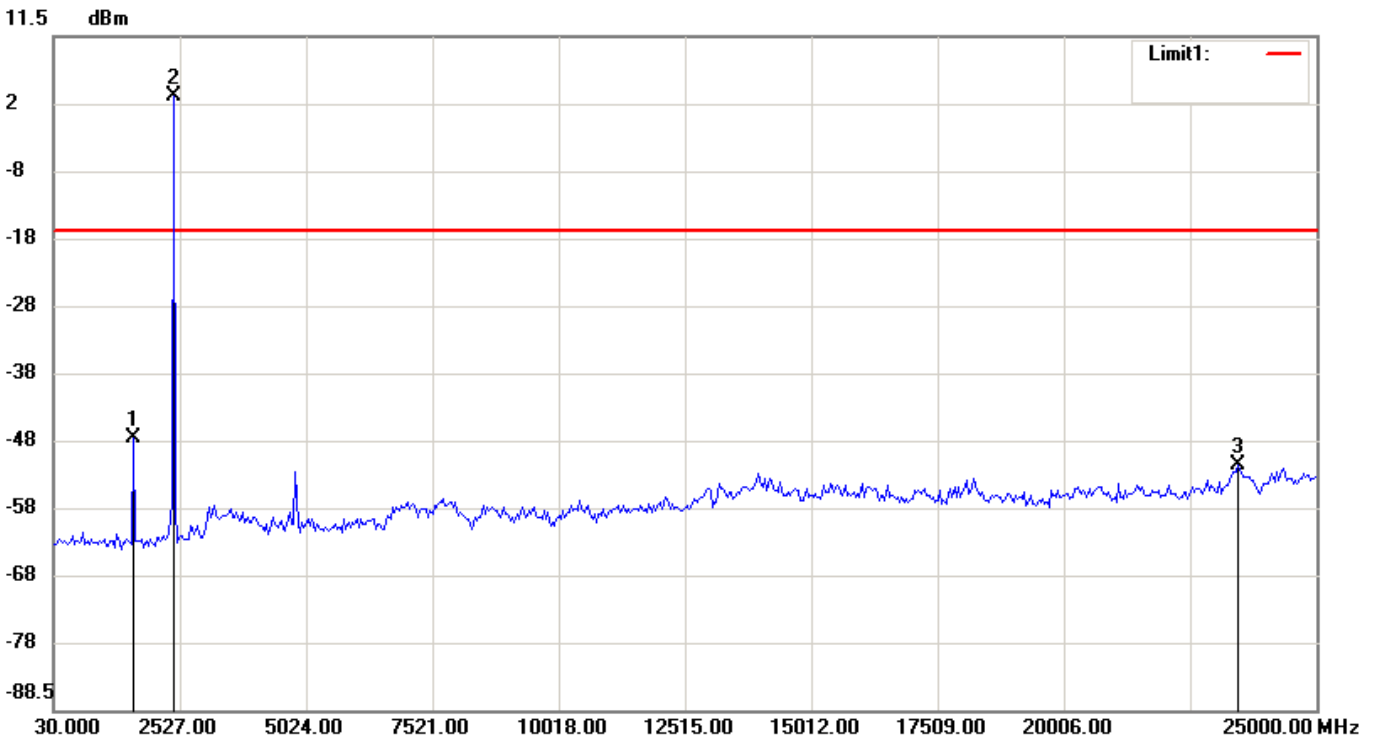
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-Bluetooth Channel 78-Bandedge (Fixed)

No.	Frequency(MHz)	Level(dBm)
1	2479.9800	2.17
2	2484.0500	-58.40

File: BTM510 Data: #5 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:20:57 Humidity: 59 %



Condition: -17.38dBm Horizontal
EUT: Bluetooth module Sweep Time: 2386.4ms Att.: 20dB
Model: BTM510 RBW: 100 KHz VBW: 300 KHz
Test Mode:
Note: FCC-BT Channel 00-Conducted Spurious

No.	Frequency(MHz)	Level(dBm)
1	1611.4333	-47.99
2	2402.1500	2.62
3	23460.1833	-51.99

File: BTM510

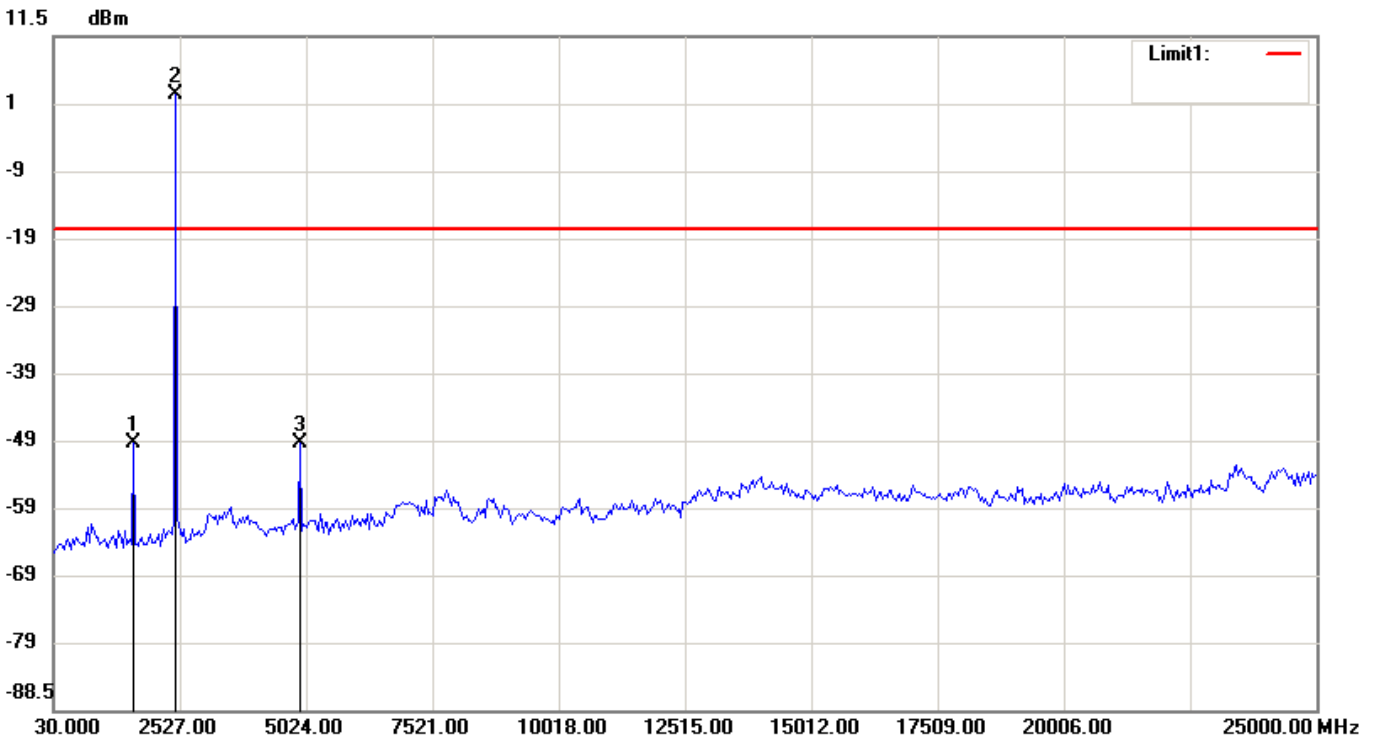
Data: #19

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:36:54

Humidity: 59 %



Condition: -17.05dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2386.4ms Att.: 20dB

Model: BTM510

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-BT Channel 39-Conducted Spurious

No.	Frequency(MHz)	Level(dBm)
1	1611.4333	-48.96
2	2443.7667	2.95
3	4899.1500	-48.82

File: BTM510

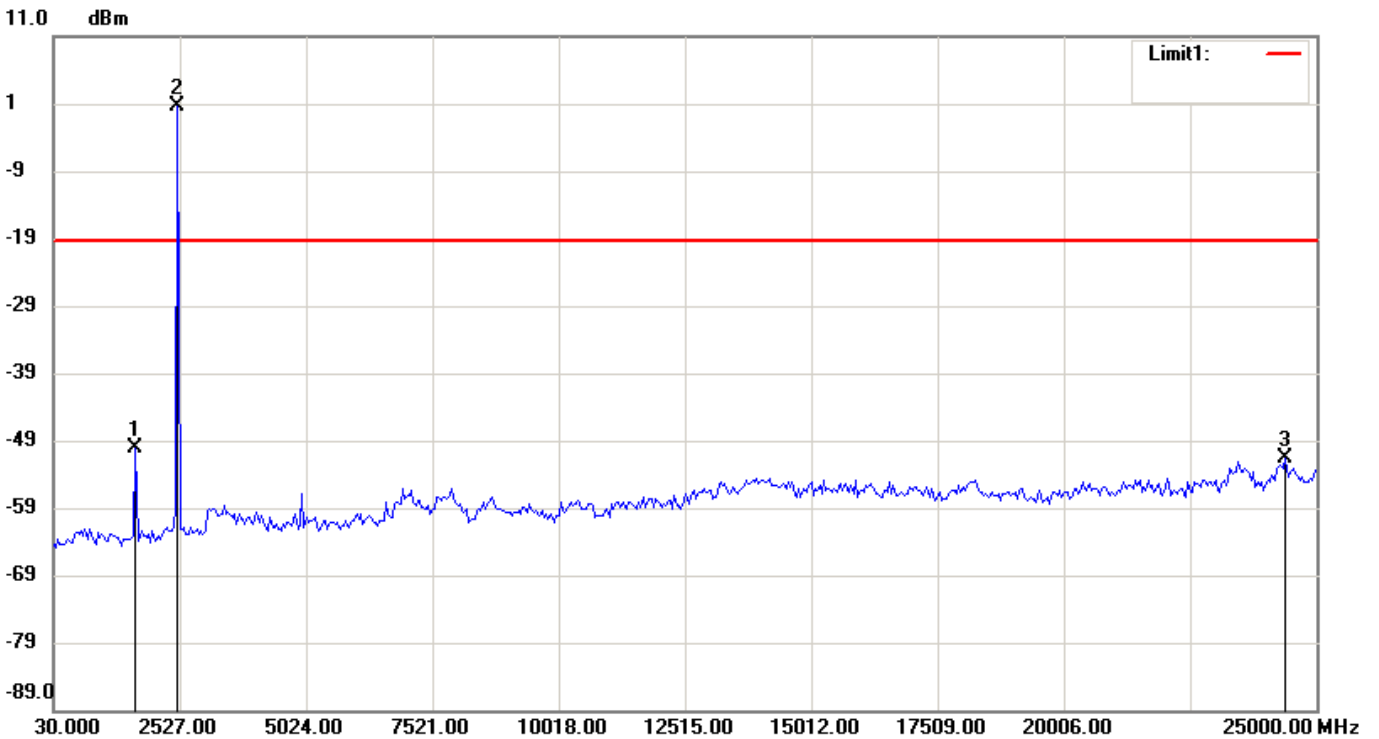
Data: #12

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:26:58

Humidity: 59 %



Condition: -19.27dBm

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC-BT Channel 78-Conducted Spurious

Horizontal

Sweep Time: 2386.4ms Att.: 20dB

RBW: 100 KHz VBW: 300 KHz

No.	Frequency(MHz)	Level(dBm)
1	1653.0500	-50.18
2	2485.3833	0.73
3	24375.7500	-51.55

9.4.2 Operation Mode: 8DPSK

Test Date : Jun. 11, 2009

Temperature : 28°C

Humidity : 59%

Channel	Test Frequency Range	Note	Chart
0	2350 MHz - 2450 MHz	Lower Band Edge	Page 56
78	2433.5 MHz - 2533.5 MHz	Upper Band Edge	Page 57
0	30 MHz - 25 GHz		Page 58
39	30 MHz - 25 GHz		Page 59
78	30 MHz - 25 GHz		Page 60

Note: Please refer to page 56 to page 60 for chart.

File: BTM510

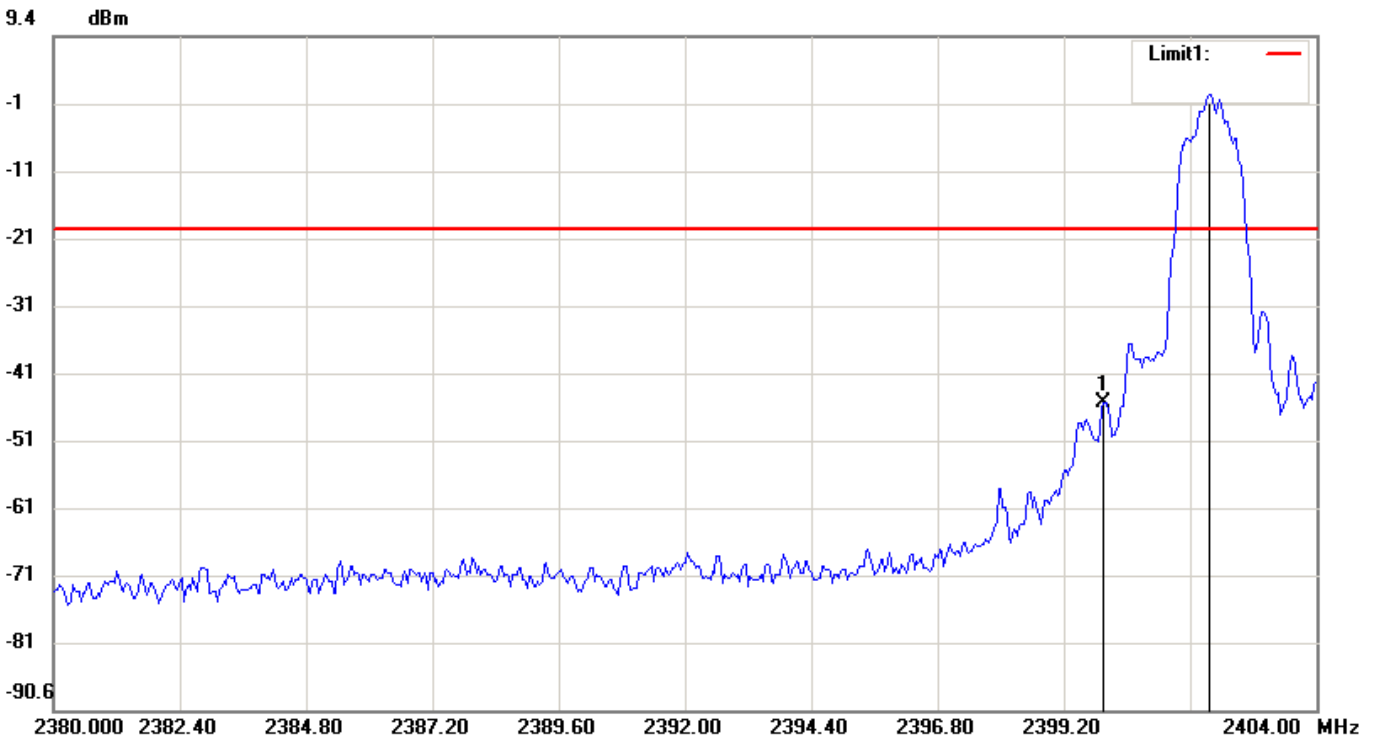
Data: #37

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:56:18

Humidity: 59 %



Condition: -19.15dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2.32ms Att.: 10dB

Model: BTM510

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-Bluetooth Channel 00-Bandedge (Fixed)

No.	Frequency(MHz)	Level(dBm)
1	2399.9600	-44.95
2	2401.9600	0.85

File: BTM510

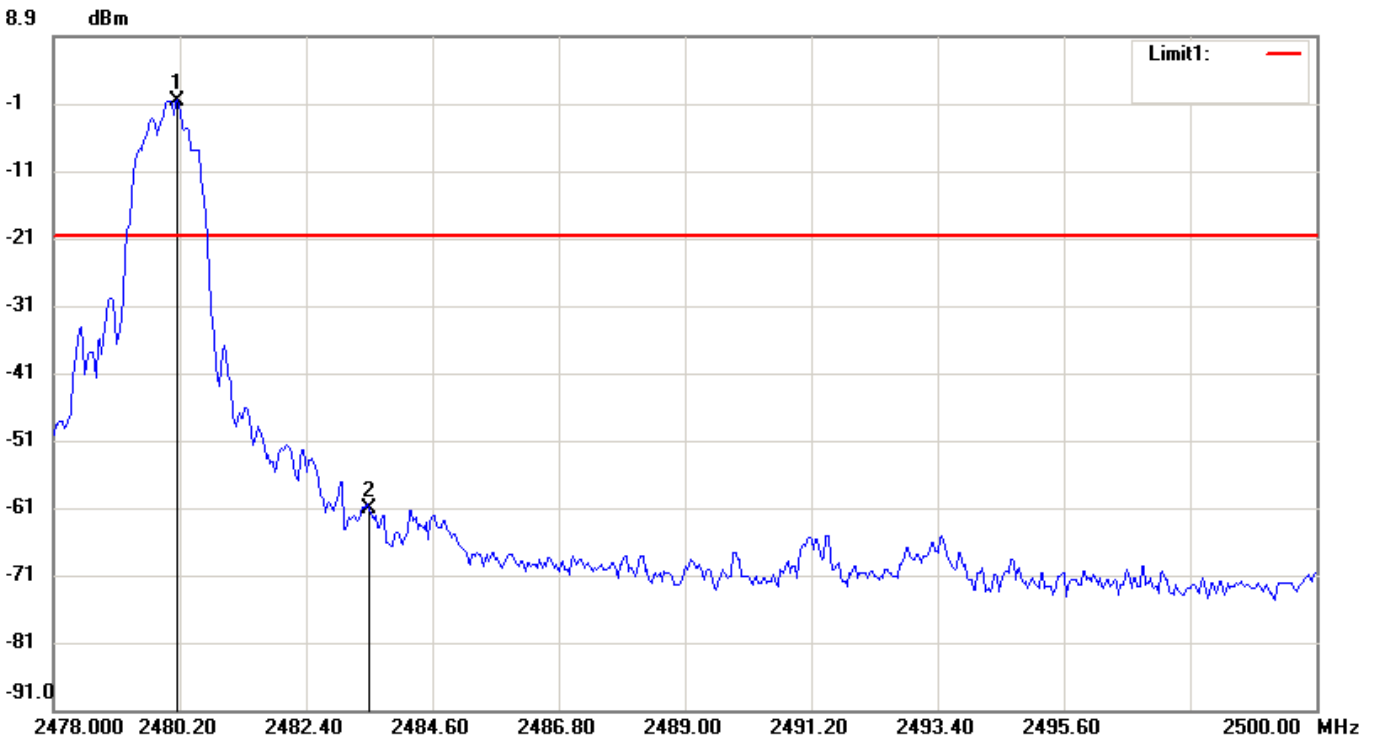
Data: #44

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:03:47

Humidity: 59 %



Condition: -20.55dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2.12ms Att.: 10dB

Model: BTM510

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-Bluetooth Channel 78-Bandedge (Fixed)

No.	Frequency(MHz)	Level(dBm)
1	2480.1633	-0.55
2	2483.5000	-61.05

File: BTM510

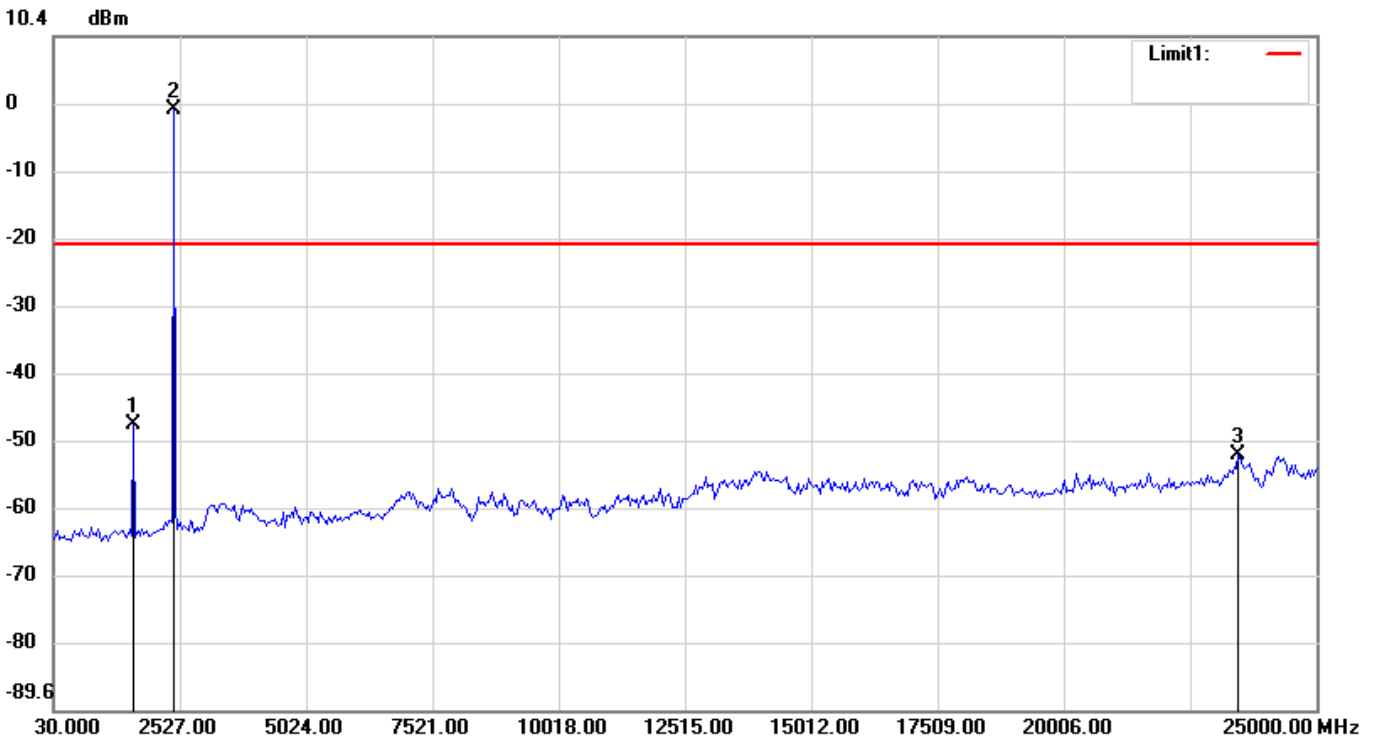
Data: #36

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:55:51

Humidity: 59 %



Condition: -20.57dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2386.4ms Att.: 20dB

Model: BTM510

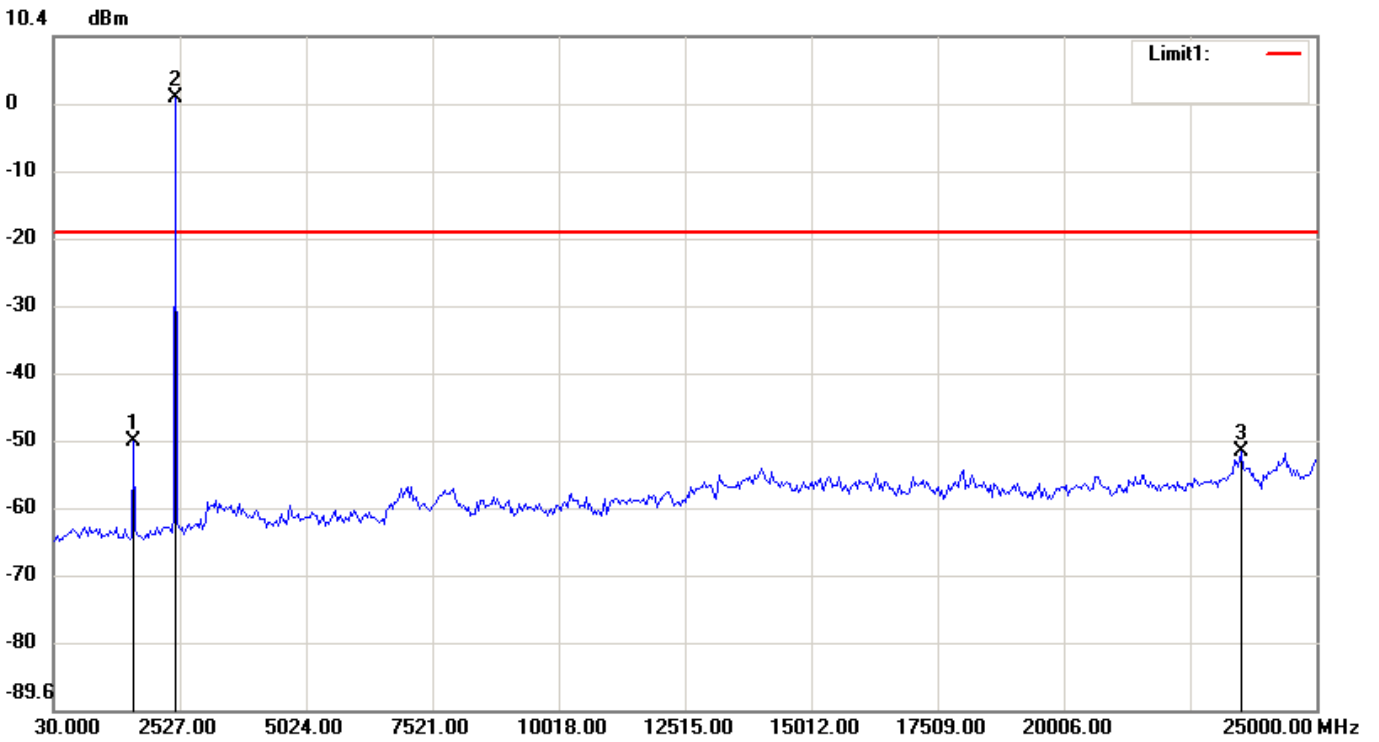
RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-BT Channel 00-Conducted Spurious

No.	Frequency(MHz)	Level(dBm)
1	1611.4333	-47.17
2	2402.1500	-0.57
3	23460.1833	-51.84

File: BTM510 Data: #50 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:08:16 Humidity: 59 %



Condition: -18.8dBm Horizontal
EUT: Bluetooth module Sweep Time: 2386.4ms Att.: 20dB
Model: BTM510 RBW: 100 KHz VBW: 300 KHz
Test Mode:
Note: FCC-BT Channel 39-Conducted Spurious

No.	Frequency(MHz)	Level(dBm)
1	1611.4333	-49.70
2	2443.7667	1.20
3	23501.8000	-51.22

File: BTM510

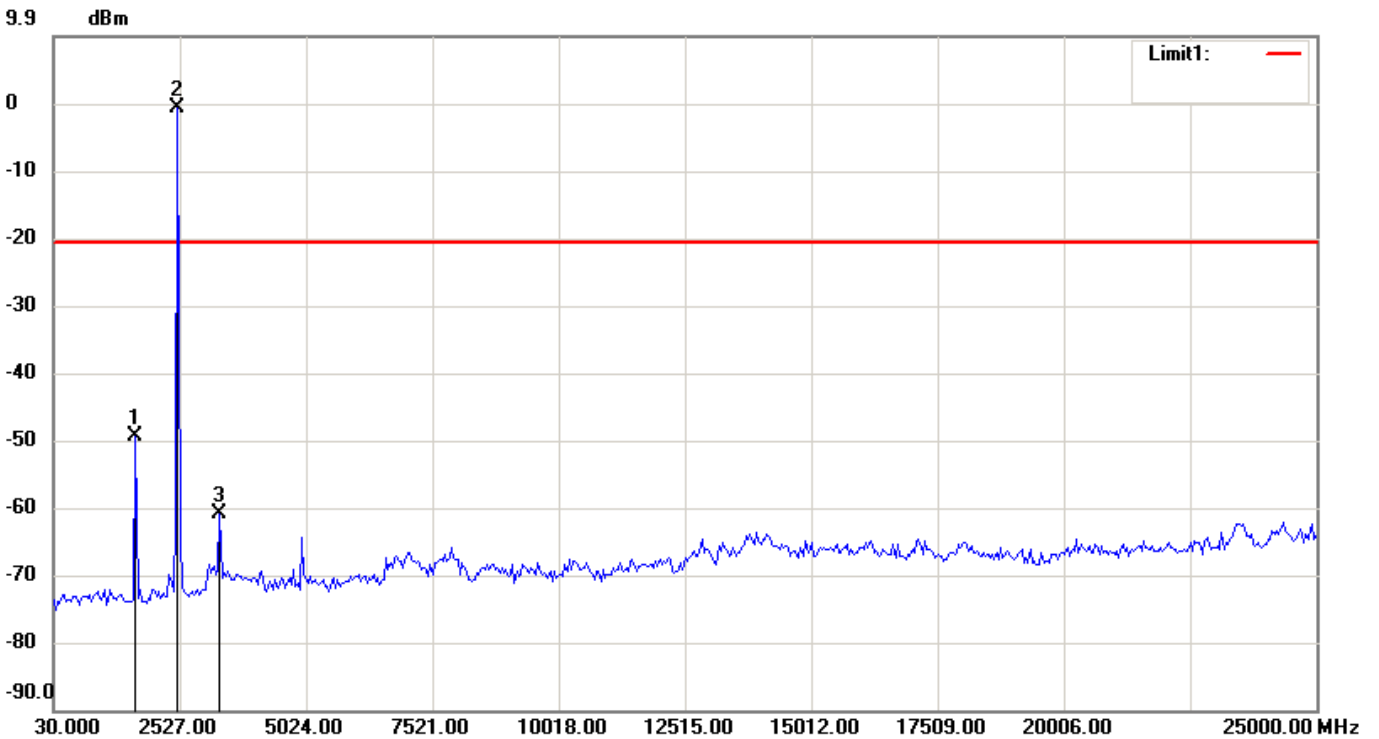
Data: #43

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:03:21

Humidity: 59 %



Condition: -20.74dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 2386.4ms Att.: 10dB

Model: BTM510

RBW: 100 KHz VBW: 300 KHz

Test Mode:

Note: FCC-BT Channel 78-Conducted Spurious

No.	Frequency(MHz)	Level(dBm)
1	1653.0500	-49.44
2	2485.3833	-0.74
3	3317.7167	-61.03

10 NUMBER of HOPPING CHANNELS

10.1 Standard Applicable

According to 15.247(b)(1), for frequency hopping systems, operating in the 2400-2483.5MHz band employing at least 75 hopping channels

10.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to hopping operating mode and set spectrum analyzer maximum to measure the number of hopping channels.

10.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

10.4 Measurement Data

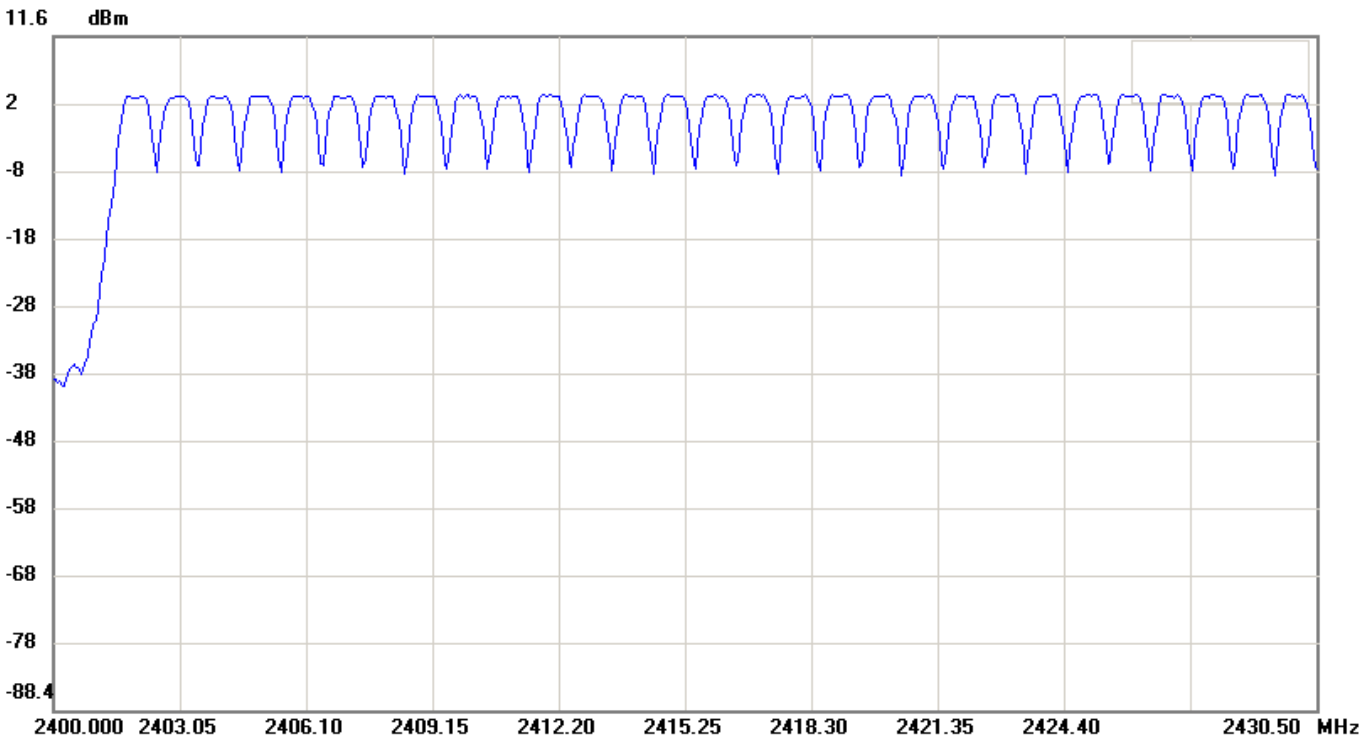
10.4.1 Operation Mode: GFSK

Test Date : Jun. 11, 2009 Temperature : 28°C Humidity : 59%

Number of hopping channels = 79 channels

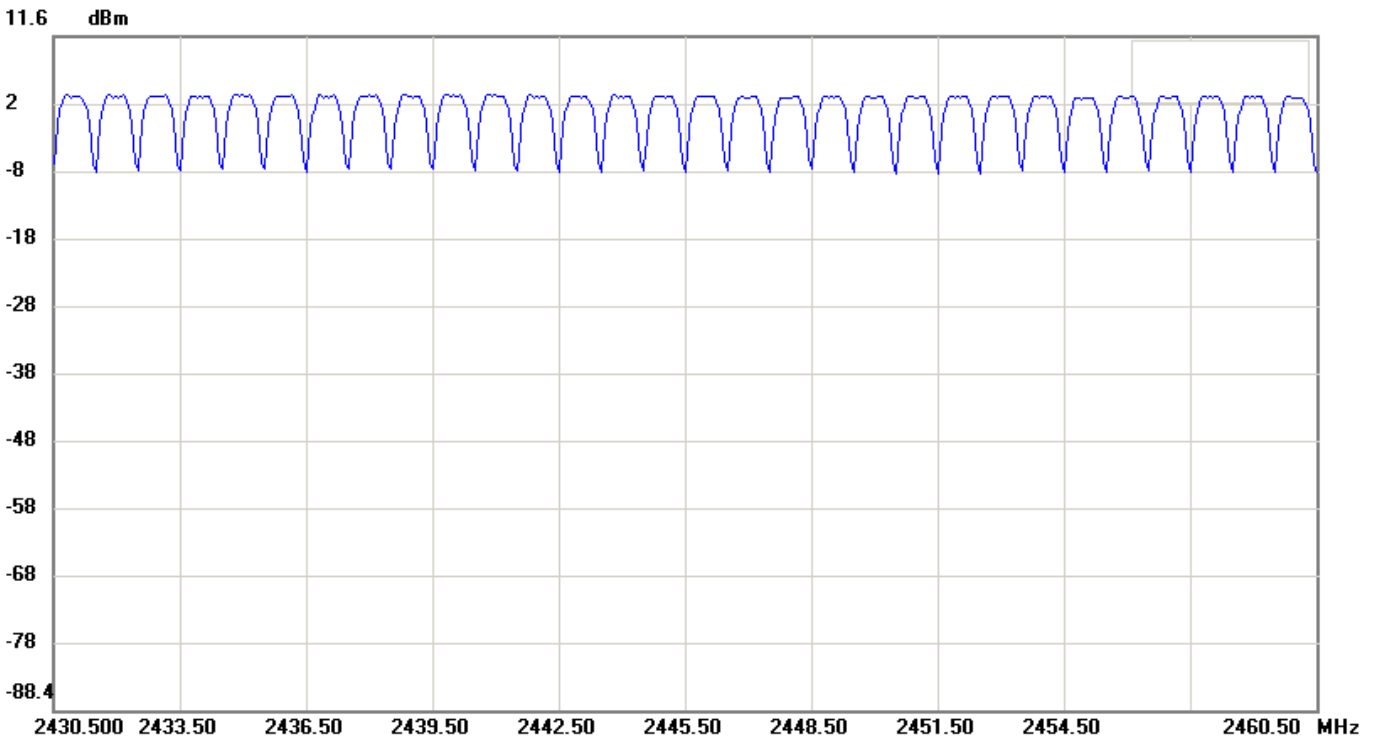
Note: Please refer to page 62 to page 64 for chart.

File: BTM510	Data: #29	Date: 2009/6/11	Temperature: 28 °C
		Time: PM 02:48:47	Humidity: 59 %



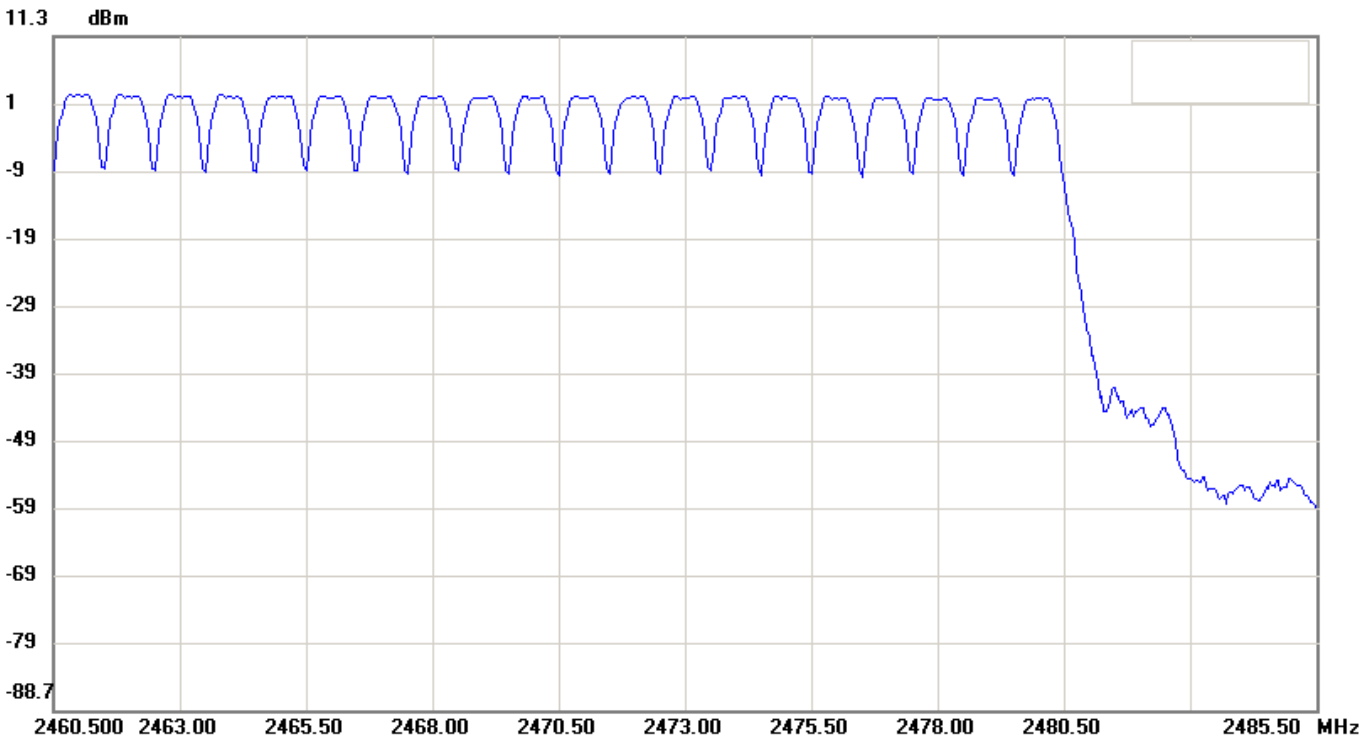
Condition:	Horizontal		
EUT:	Bluetooth module	Sweep Time: 1ms	Att.: 20dB
Model:	BTM510	RBW: 300 KHz	VBW: 300 KHz
Test Mode:			
Note:	FCC-Bluetooth Number of Hopping Channels -Part1		

File: BTM510 Data: #30 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:50:39 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 1ms Att.: 20dB
Model: BTM510 RBW: 300 KHz VBW: 300 KHz
Test Mode:
Note: FCC-Bluetooth Number of Hopping Channels -Part2

File: BTM510 Data: #31 Date: 2009/6/11 Temperature: 28 °C
Time: PM 02:52:30 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 1ms Att.: 20dB
Model: BTM510 RBW: 300 KHz VBW: 300 KHz
Test Mode:
Note: FCC-Bluetooth Number of Hopping Channels -Part3

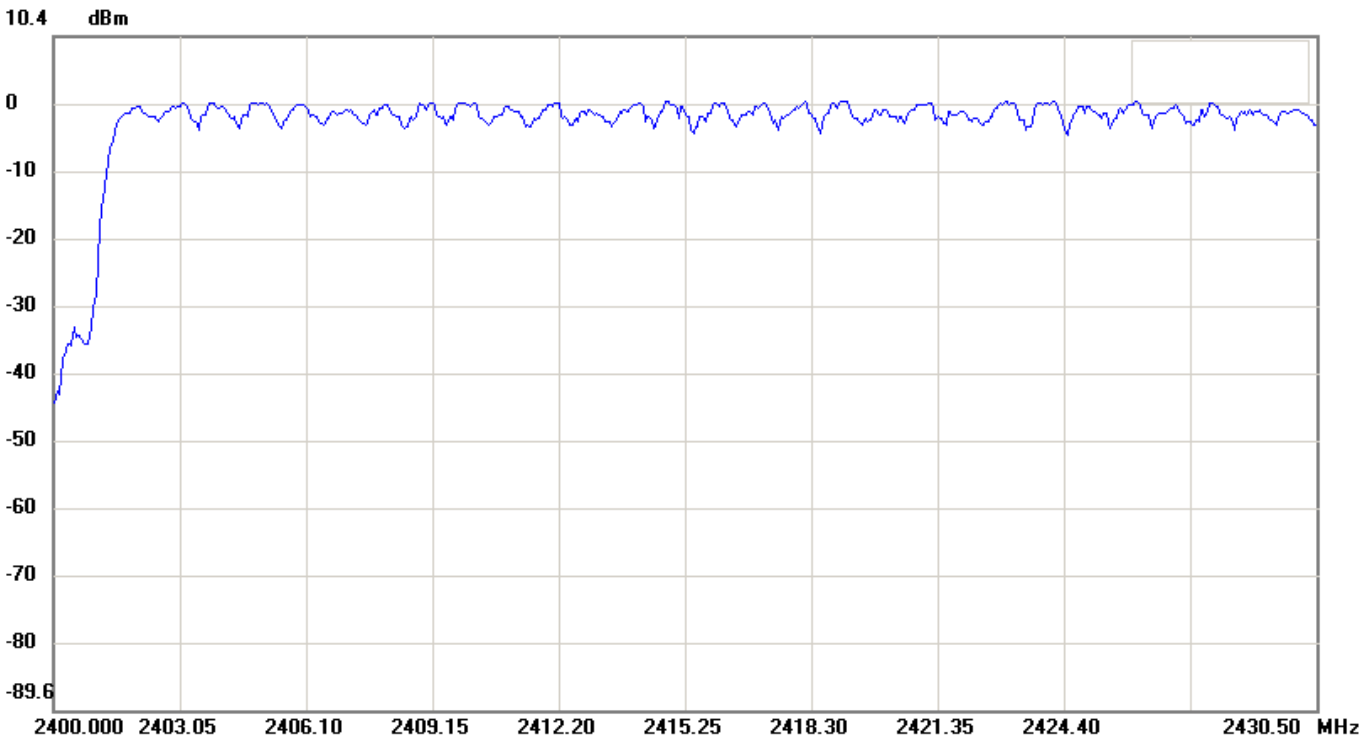
10.4.2 Operation Mode: 8DPSK

Test Date : Jun. 12, 2009 Temperature : 28°C Humidity : 59%

Number of hopping channels = 79 channels

Note: Please refer to page 66 to page 68 for chart.

File: BTM510 Data: #60 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:19:48 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 1ms Att.: 20dB
Model: BTM510 RBW: 300 KHz VBW: 300 KHz
Test Mode:
Note: FCC-Bluetooth Number of Hopping Channels -Part1

File: BTM510

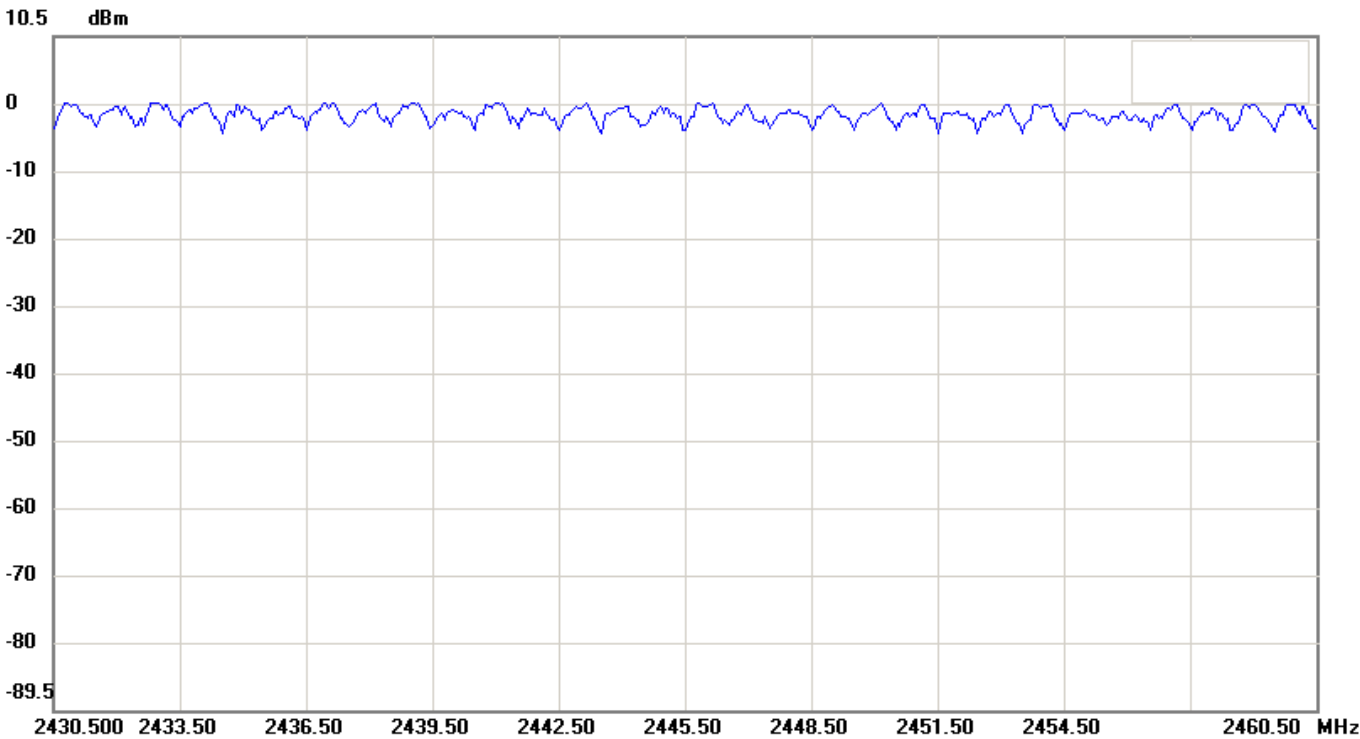
Data: #61

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:21:40

Humidity: 59 %



Condition: Horizontal

EUT: Bluetooth module

Model: BTM510

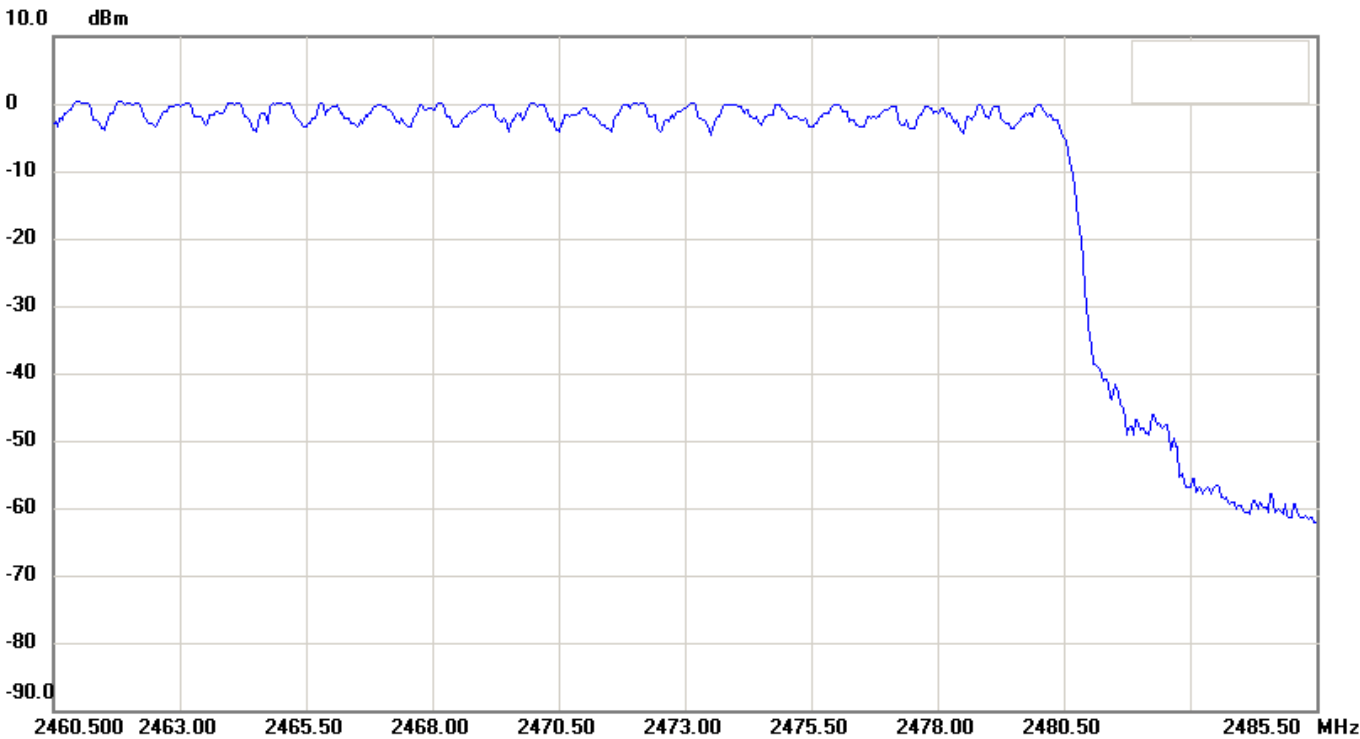
Test Mode:

Note: FCC-Bluetooth Number of Hopping Channels -Part2

Sweep Time: 1ms Att.: 20dB

RBW: 300 KHz VBW: 300 KHz

File: BTM510 Data: #62 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:23:31 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 1ms Att.: 10dB
Model: BTM510 RBW: 300 KHz VBW: 300 KHz
Test Mode:
Note: FCC-Bluetooth Number of Hopping Channels -Part3

11 HOPPING CHANNEL CARRIER FREQUENCY SEPARATED

11.1 Standard Applicable

According to 15.247(a)(1), the frequency hopping system shall have hopping channel carrier frequencies separated by minimum of 25kHz or the 20dB bandwidth of hopping channel, whichever is greater.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measurement frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set spectrum analyzer maximum hold to measure channel carrier frequency, then adjust channel carrier frequency to adjacent channel.
4. Repeat above procedure until all measured frequencies were complete.

11.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

11.4 Measurement Data

11.4.1 Operation Mode: GFSK

Test Date : Jun. 11, 2009 Temperature : 28℃ Humidity : 59%

Channel	Frequency (MHz)	Hopping Channel Carrier Frequency Separated (MHz)	Chart
39	2441	1.025	Page 71

Note: Please refer to page 71 for chart.

File: BTM510

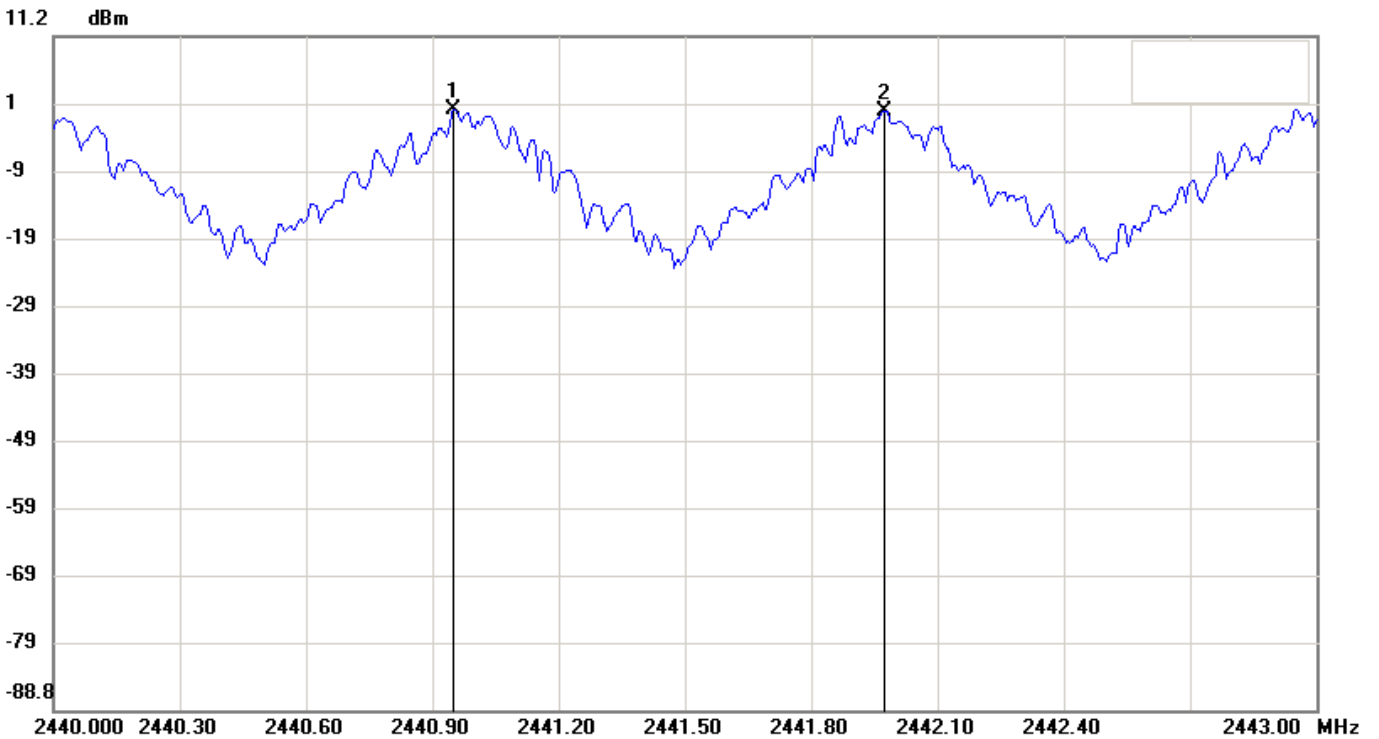
Data: #26

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:44:55

Humidity: 59 %



Condition:

EUT: Bluetooth module

Model: BTM510

Test Mode:

Note: FCC-Bluetooth Carrier Frequency Separation

Horizontal

Sweep Time: 3.2ms Att.: 20dB

RBW: 30 KHz VBW: 100 KHz

No.	Frequency(MHz)	Level(dBm)
1	2440.9500	0.40
2	2441.9750	0.16

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk2-mk1	1.025	-0.24

11.4.2 Operation Mode: 8DPSK

Test Date : Jun. 11, 2009

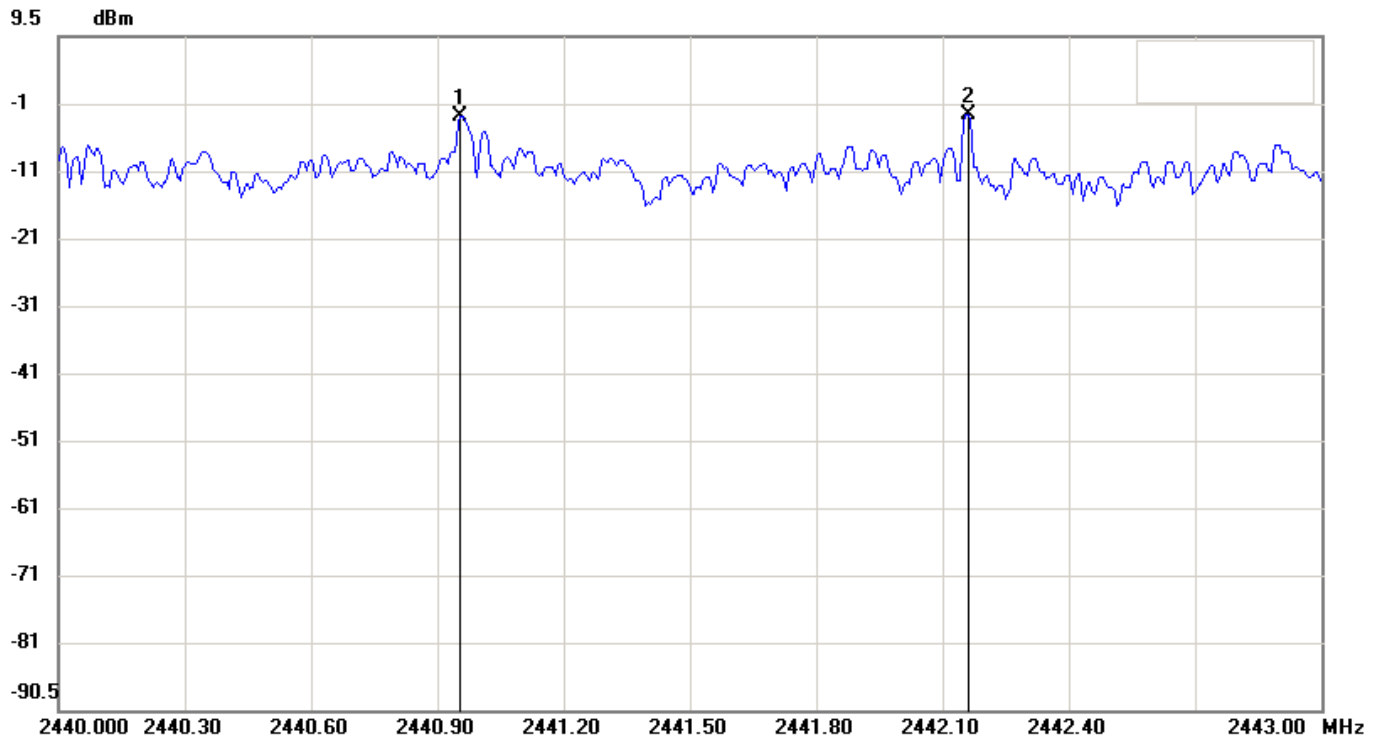
Temperature : 28°C

Humidity : 59%

Channel	Frequency (MHz)	Hopping Channel Carrier Frequency Separated (MHz)	Chart
39	2441	1.205	Page 73

Note: Please refer to page 73 for chart.

File: BTM510 Data: #57 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:15:55 Humidity: 59 %



Condition: Horizontal
EUT: Bluetooth module Sweep Time: 3.2ms Att.: 10dB
Model: BTM510 RBW: 30 KHz VBW: 100 KHz
Test Mode:
Note: FCC-Bluetooth Carrier Frequency Separation

No.	Frequency(MHz)	Level(dBm)
1	2440.9550	-2.27
2	2442.1600	-2.06

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk2-mk1	1.205	0.21

12 Dwell Time

12.1 Standard Applicable

According to 15.247(a)(1)(iii), frequency hopping system in the 2400-2483.5MHz band employing at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 second multiplied by the number of hopping channels employed.

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 4.

12.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/30/2009

12.4 Measurement Data

Test Date : Jun. 11, 2009

Temperature : 28°C

Humidity : 59%

12.4.1 DH1

Test period=0.4(second/channel)× 79 channel=31.6sec

2402MHz dwell time= 415.0 us× 340 = 141.1 ms

Note: Please refer to page 75 to page 76 for chart.

File: BTM510

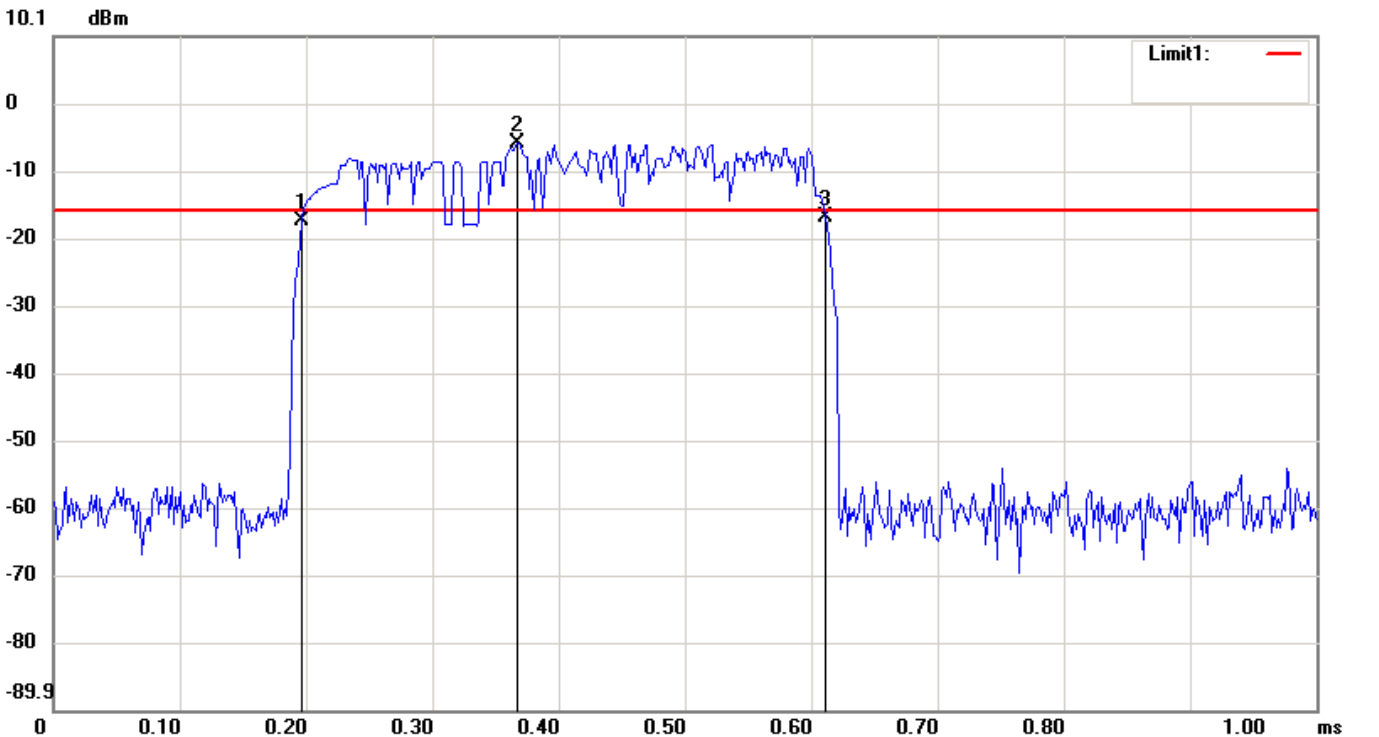
Data: #52

Date: 2009/6/11

Temperature: 28 °C

Time: PM 03:09:25

Humidity: 59 %



Condition: -15.72dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 1ms Att.: 20dB

Model: BTM510

RBW: 1000 KHz VBW: 1000 KHz

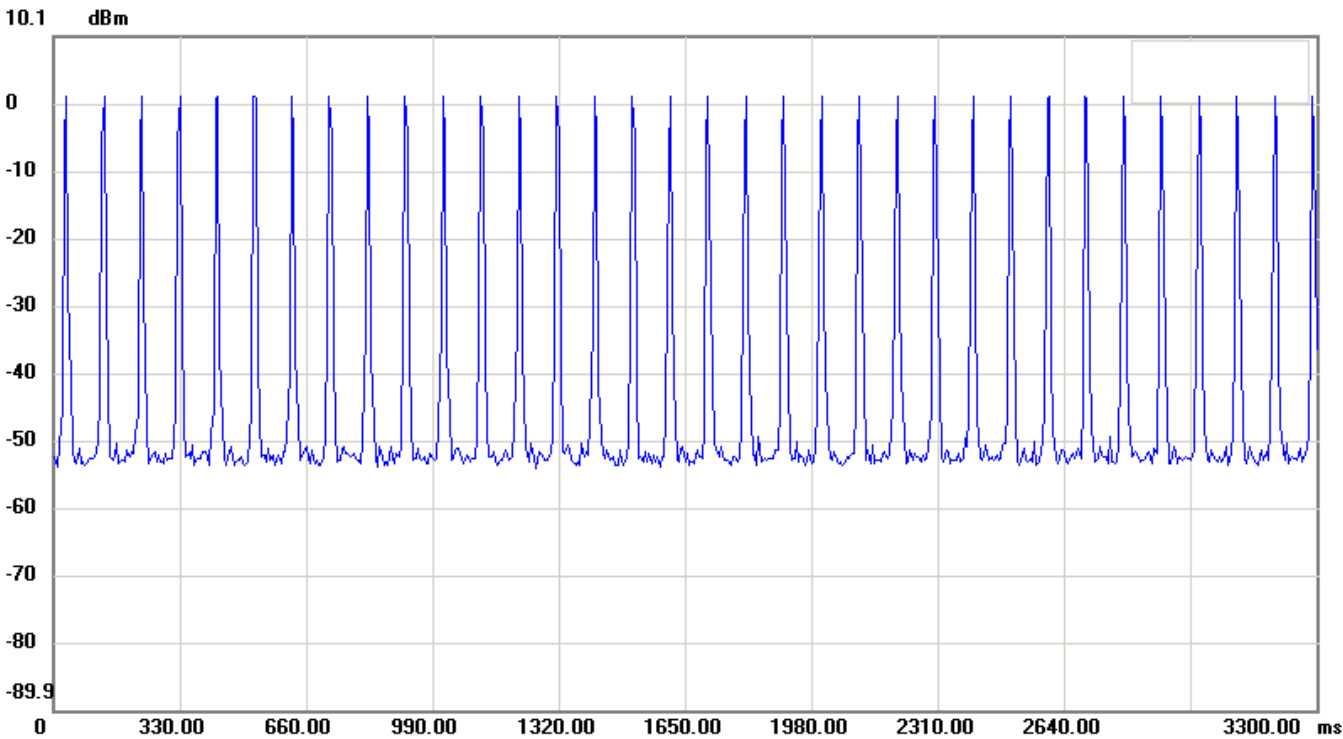
Test Mode:

Note: DH1 pulse width

No.	Sweep time(ms)	Level(dBm)
1	0.1967	-17.16
2	0.3667	-5.72
3	0.6117	-16.82

No.		Δ Time(ms)	Δ Level(dB)
1	mk3-mk1	0.415	0.34

File: BTM510	Data: #51	Date: 2009/6/11	Temperature: 28 °C
		Time: PM 03:09:08	Humidity: 59 %



Condition:		Horizontal
EUT:	Bluetooth module	Sweep Time: 3300ms Att.: 20dB
Model:	BTM510	RBW: 1000 KHz VBW: 1000 KHz
Test Mode:		
Note:	DH1 Hops per 3.16 seconds	

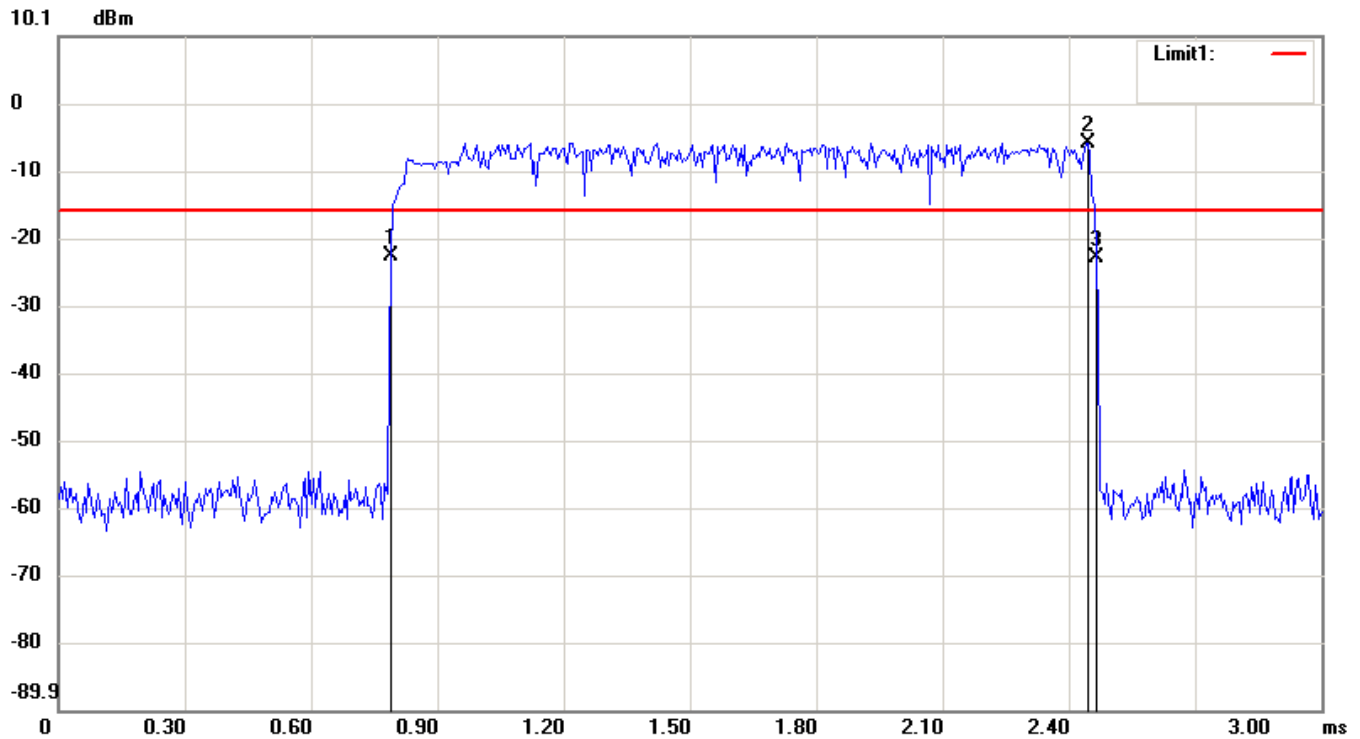
12.4.2 DH3

Test period=0.4(second/channel)×79 channel=31.6sec

2441MHz dwell time= 1.675 ms×170 = 284.8 ms

Note: Please refer to page 78 to page 79 for chart.

File: BTM510 Data: #54 Date: 2009/6/11 Temperature: 28 °C
Time: PM 03:11:43 Humidity: 59 %

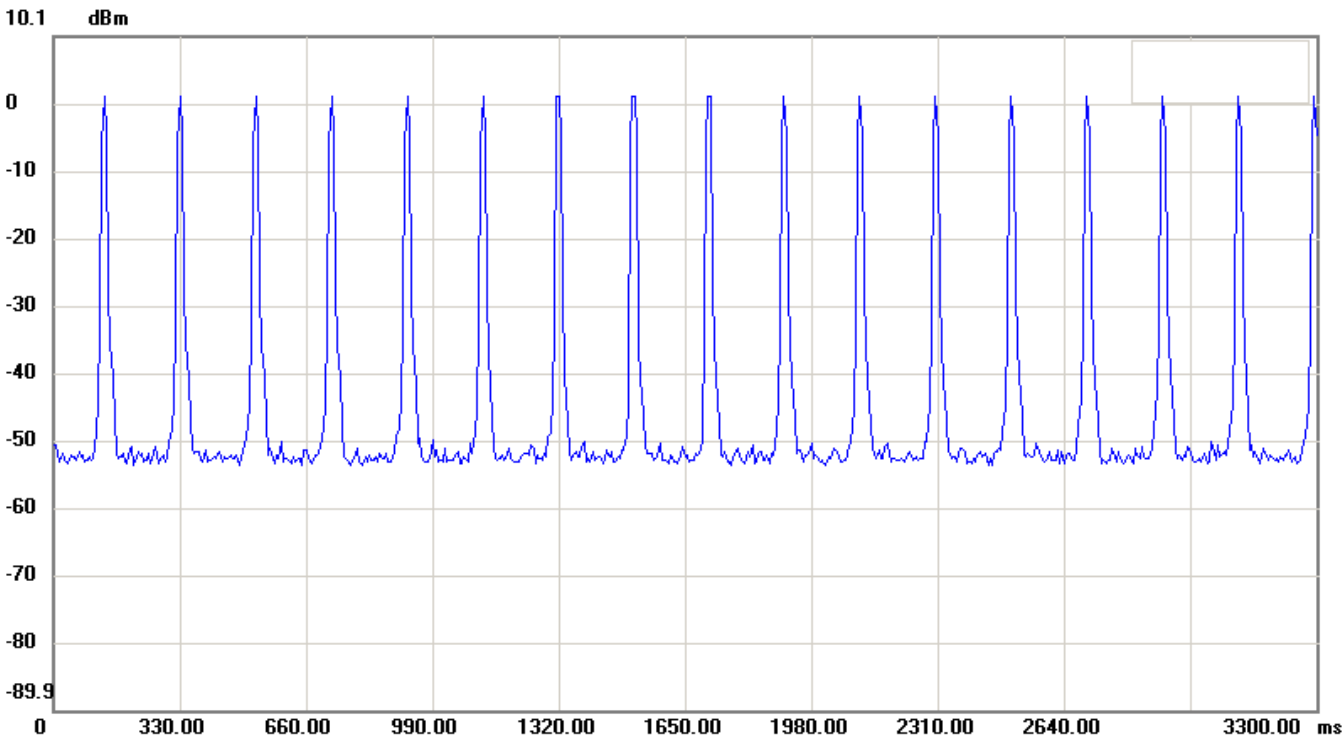


Condition: -15.67dBm Horizontal
EUT: Bluetooth module Sweep Time: 3ms Att.: 20dB
Model: BTM510 RBW: 1000 KHz VBW: 1000 KHz
Test Mode:
Note: DH3 pusle width

No.	Sweep time(ms)	Level(dBm)
1	0.7900	-22.49
2	2.4450	-5.67
3	2.4650	-22.67

No.		Δ Time(ms)	Δ Level(dB)
1	mk3-mk1	1.675	-0.18

File: BTM510	Data: #53	Date: 2009/6/11	Temperature: 28 °C
		Time: PM 03:11:26	Humidity: 59 %



Condition:		Horizontal
EUT:	Bluetooth module	Sweep Time: 3300ms Att.: 20dB
Model:	BTM510	RBW: 1000 KHz VBW: 1000 KHz
Test Mode:		
Note:	DH3 Hops per 3.16 seconds	

12.4.3 DH5

Test period=0.4(second/channel)×79 channel=31.6sec

2480MHz dwell time= 2.917 ms×110 = 320.8 ms

Note: Please refer to page 81 to page 82 for chart.

File: BTM510

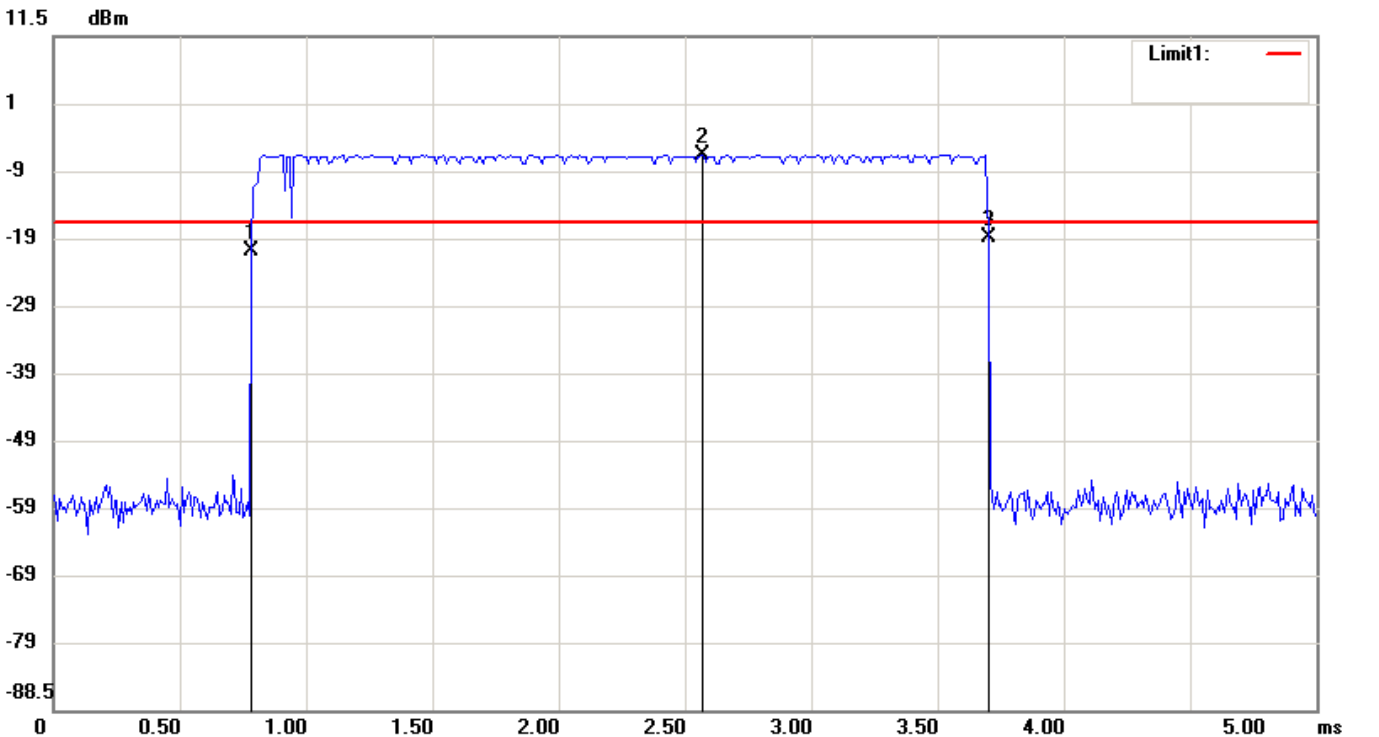
Data: #25

Date: 2009/6/11

Temperature: 28 °C

Time: PM 02:43:55

Humidity: 59 %



Condition: -16.19dBm

Horizontal

EUT: Bluetooth module

Sweep Time: 5ms Att.: 20dB

Model: BTM510

RBW: 1000 KHz VBW: 1000 KHz

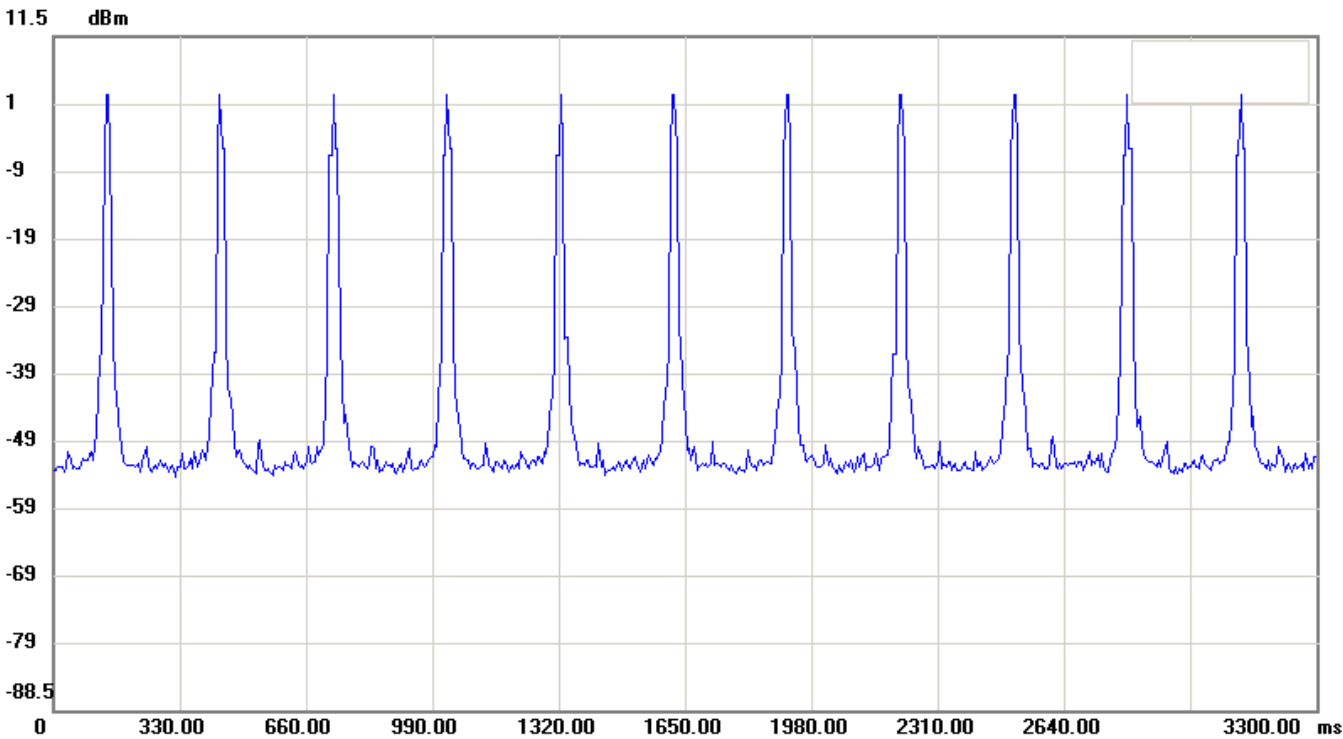
Test Mode:

Note: DH5 pulse width

No.	Sweep time(ms)	Level(dBm)
1	0.7833	-20.45
2	2.5667	-6.19
3	3.7000	-18.43

No.		Δ Time(ms)	Δ Level(dB)
1	mk3-mk1	2.9167	2.02

File: BTM510	Data: #24	Date: 2009/6/11	Temperature: 28 °C
		Time: PM 02:43:37	Humidity: 59 %



Condition:		Horizontal
EUT:	Bluetooth module	Sweep Time: 3300ms Att.: 20dB
Model:	BTM510	RBW: 1000 KHz VBW: 1000 KHz
Test Mode:		
Note:	DH5 Hops per 3.16 seconds	