MEASUREMENT REPORT
of
Matias Bluetooth Folding Keyboard

Applicant	**:**	Matias Corporation
EUT	**:**	Matias Bluetooth Folding Keyboard
FCC ID	**:**	WKMFK304305
Model	**:**	FK304, FK305, FK304-XX, FK-305-XX, FK304RM, FK304M, FK305RM, FK305M (X=A~Z)

Tested by :

Training Research Co., Ltd.

TEL : 886-2-26935155 FAX : 886-2-26934440

No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (2003) as a reference. All test were conducted by ***Training Research Co., Ltd.***, *No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.* Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.247.

Applicant	**:**	Matias Corporation
Applicant address	**:**	129 Rowntree Dairy Rd, Unit 20, Vaughan, Ontario, L4L 6eE1, Canada
FCC ID	**:**	WKMFK304305
Report No.	**:**	I2615080229
Test Date	**:**	July 31, 2008

Prepared by: *Jack Tsai* **Approved by:** *Frank Tsai*

Conditions of issue :

(1) This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.

(2) This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.

(3) This test report, measurements made by TRC are traceable to the NIST only Conducted and Radiated Method.

NVLAP LAB CODE 200174-0

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Ⅰ. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of applicant in support that the certification in accordance with Part 2 Subpart J and Part 15 Subpart A and C of the Commission's Rules and Regulations.

1.2 Description of EUT

FCC ID	**:**	WKMFK304305
Product Name	**:**	Matias Bluetooth Folding Keyboard
Model	**:**	FK304, FK305, FK304-XX, FK-305-XX, FK304RM, FK304M, FK305RM, FK305M (X=A~Z)
Frequency Range	**:**	2402MHz to 2480MHz
Support Channel	**:**	79 Channels
Channel Spacing	**:**	1MHz
Modulation Skill	**:**	GFSK
Power Type	**:**	Powered by DC 1.5V batteries (AAA*2)

1.3 Test method

1 Powered by batteries.

2 The notebook PC and test fixture is connected by RS-232 cable, and then test fixture connected with EUT setting test mode.

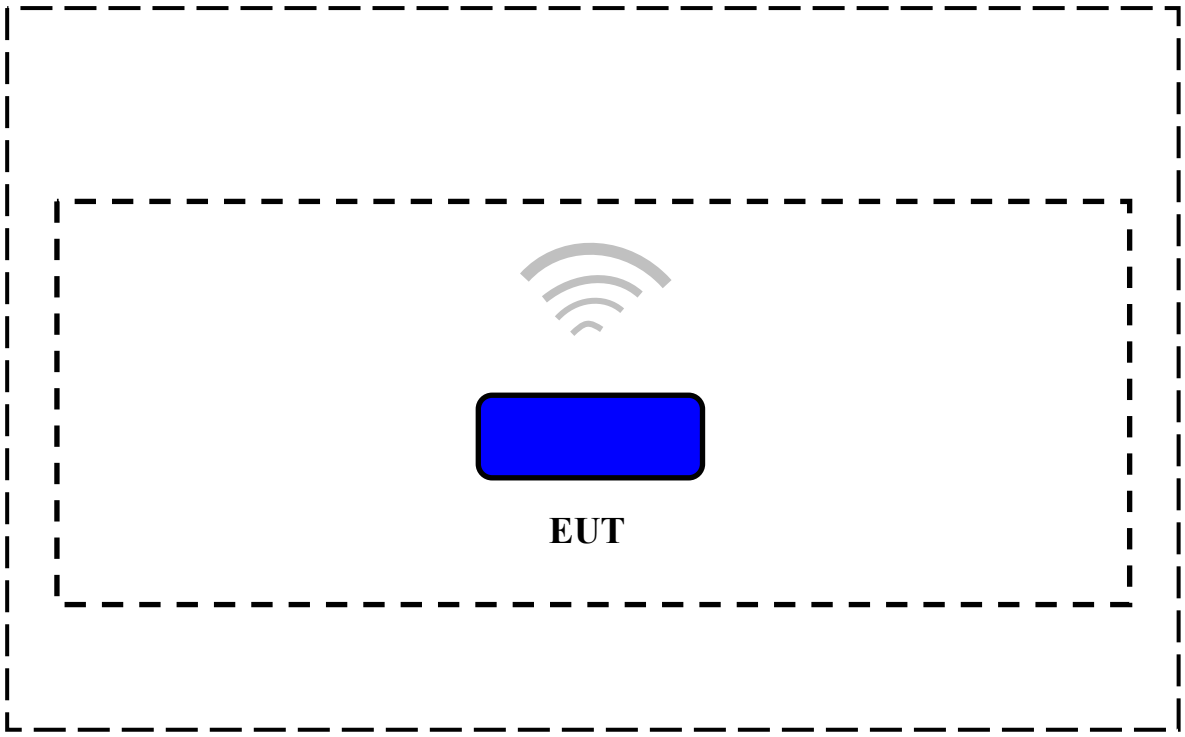
3 The Notebook PC and test fixture is moving when test mode set finish. The software provided by the manufacturer, the test is performed under the specific conditions.

4 Set different channel (CH1/CH40/CH79) and making EUT to the mode of continuous transmission.

1.4 Description of Support Equipment

Notebook PC	**:**	**IBM**
Model No.	:	2668HT
Serial No.	:	FX-V3657 01/11
FCC ID	:	DoC Approved
BSMI	:	3892B565
Power type	:	By AC Adapter
Test fixture	**:**	**Ione Technology Inc.**
Model No.	:	YFBT-01 Firmwear_updata_Board
Power type	:	By Notebook PC
Data cable	:	Shielded, 1.2m length, without ferrite core

1.5 Configuration of System Under Test



The tests below are carried with the EUT transmitter set at high power in TDD mode. The EUT is forced to select of output power level and channel number by NB PCMCIA interface.

The setting up procedure was recorded in 1.3 test method.

1.6 Verify the Frequency (MHz) and Channel

CH	0	1	2	3	4	5	6	7	8	9
0		2402	2403	2404	2405	2406	2407	2408	2409	2410
1	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420
2	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430
3	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440
4	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450
5	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460
6	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470
7	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480

Note:

1. This is for confirming that all frequencies are in 2.402GHz to 2.480GHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz.
   (The locations of these frequencies one near the top, one near the middle and one near the bottom.)
3. After test, the EUT operating frequencies are in 2.402GHz to 2.480GHz. So all the items as followed in testing report are need to test these three frequencies:
   Top: Channel – 01; Middle: Channel – 40; Bottom: Channel – 79.

1.7 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (2003) and the pre-setup was written on 1.3 test method, the detail setup was written on each test item.

1.8 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Anechoic Chamber (FCC Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.9 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

There is a test condition apply in this test item, the test procedure description as <1.3 test method>. Three channels were tested, one in the top (CH1), one in the middle (CH40) and the other in bottom (CH79).

II. Section 15.203: Antenna requirement

The EUT has an integrated antenna permanently attached on the PCB, which inside the housing. In addition, there is no external antenna or connector employed. The antenna requirement stated in Sect.15.203 is inapplicable to this EUT.

III. Section 15.207: Power Line Conducted Emissions for AC Powered Units

3.1 Test Condition & Setup

The EUT operates solely by the batteries (AAA*2 DC 1.5V batteries).

According to the rule of section 15.207(c), the EUT exempt to the power line conducted test.

3.2 List of Test Instruments

N/A (Not applicable)

3.3 Test Result of Conducted Emissions

N/A (Not applicable)

IV. Section 15.247 (a): Technical description of the EUT

Based on the Section 2.1, *Frequency Hopping Spectrum System* is a spread spectrum system in which the carrier has been modulated by a *high speed spreading code* and an *information data stream* with its *known hopping algorithm* and *avoidance method.* The high speed code sequence dominates the "modulating function" and is the direct cause of the wide spreading of the transmitted signal. In the *operational description* demonstrates the operation principles of the base-band processor employed by the EUT, shows that which is a complete FHSS base-band processor and meets the definition of the *Frequency Hopping Spectrum System.*

V. Section 15.247(a)(1): Carrier Frequency Separation

5.1 Test Condition

The EUT must have its hopping function enabled. Use the following spectrum analyzer setting

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) bandwidth (RBW) ≧ 1% of the span

Video (or Average) Bandwidth (VBW) ≧ RBW

Sweep = Auto

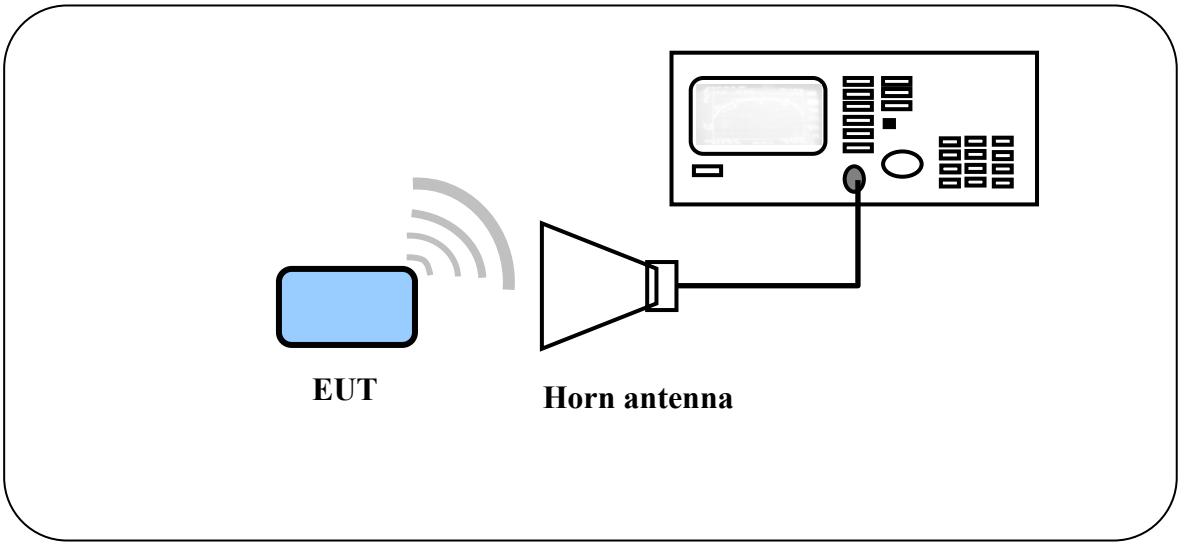
Detector Function = peak

Trace = max hold

Setting up procedure is written on 1.3 test method.

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channel. The limit is specified in one of the subparagraphs of this section. Submit this plot.

5.2 Test Instruments Configuration



Test Configuration of carrier frequency separation

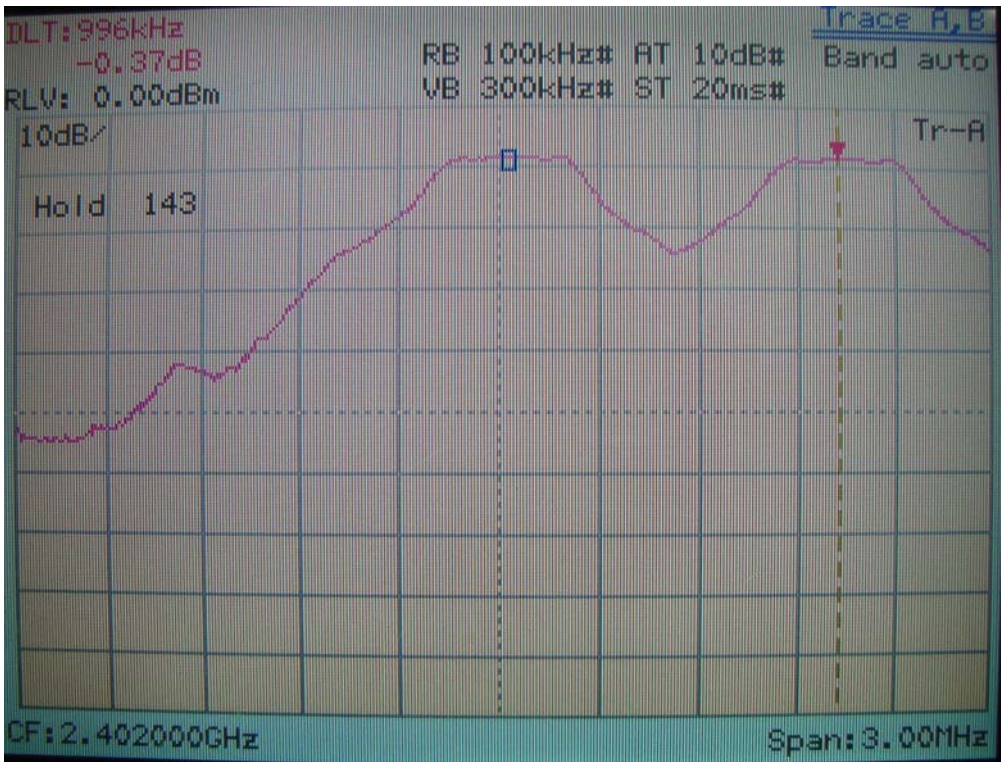
5.3 List of Test Instruments

				Calibration Date
Instrument Name	**Model No.**	**Brand**	**Serial No.**	**Next time**
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08
Horn Antenna	3115	EMCO	9104-3668	12/14/08

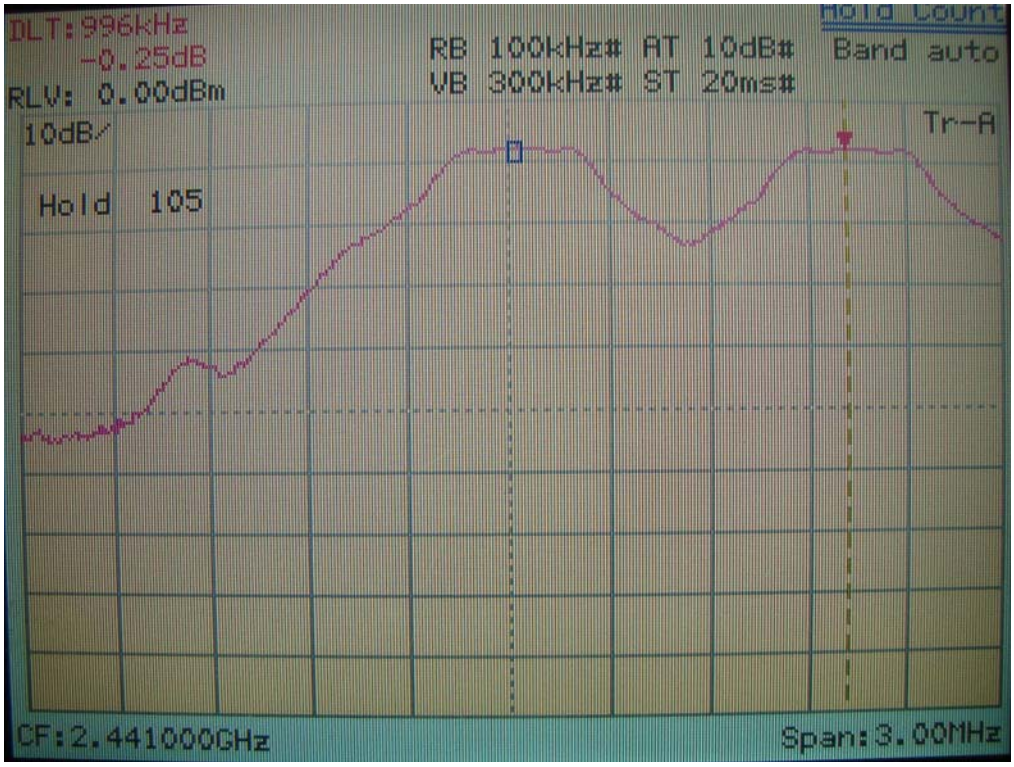
5.4 Test Results

Channel	Bluetooth
01	996 kHz
40	996 kHz
79	990 kHz

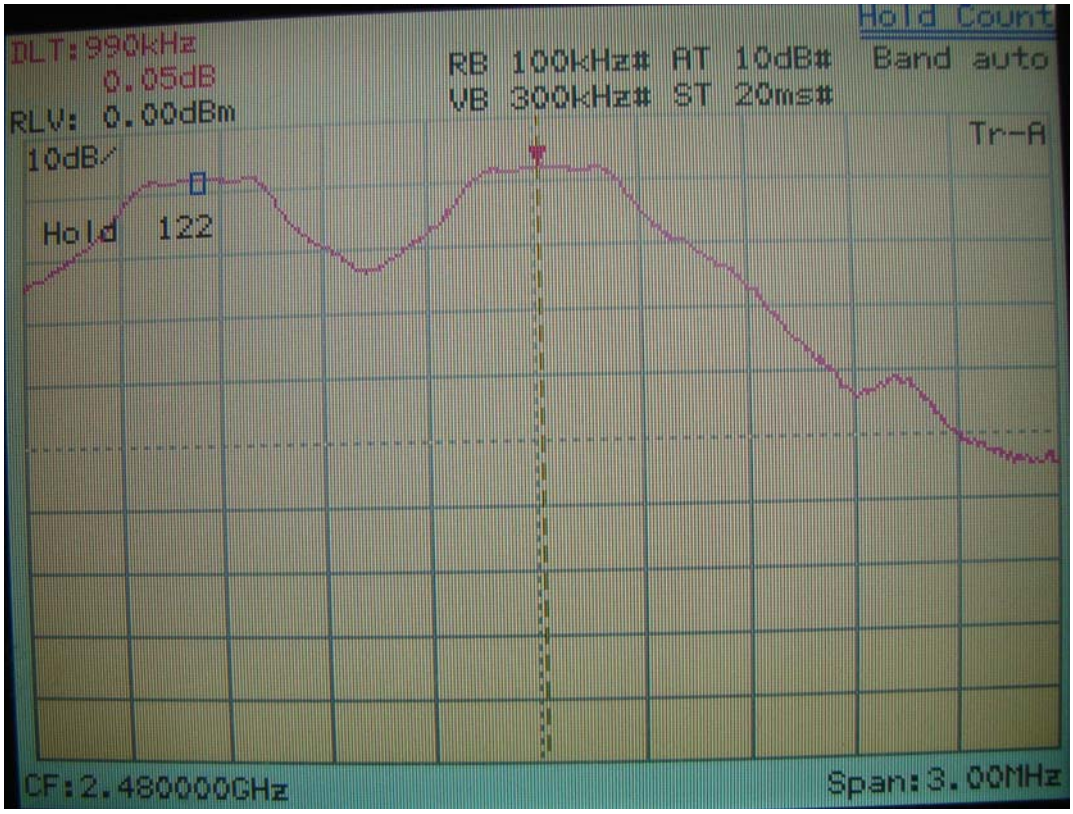
Carrier Frequency Separation for CH01



Carrier Frequency Separation for CH40



Carrier Frequency Separation for CH79



VI. Section 15.247(a)(1)(ii) Number of Hopping Frequencies

6.1 Test Condition

The EUT must have its Hopping function enabled. Use the following spectrum analyzer setting:

Span = the frequency band of operation

RBW ≧ 1% of the span

VBW ≧ RBW

Sweep = auto

Detector function = peak

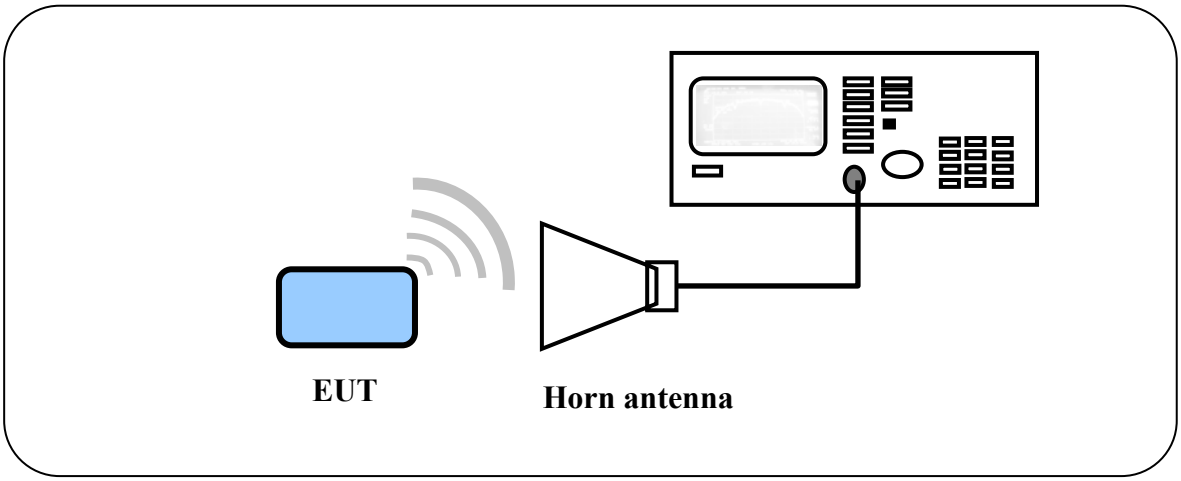
Trace = max hold

Allow the trace to stabilize. It may prove necessary to break the span up to sections. In order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this section.

6.2 List of Test Instruments

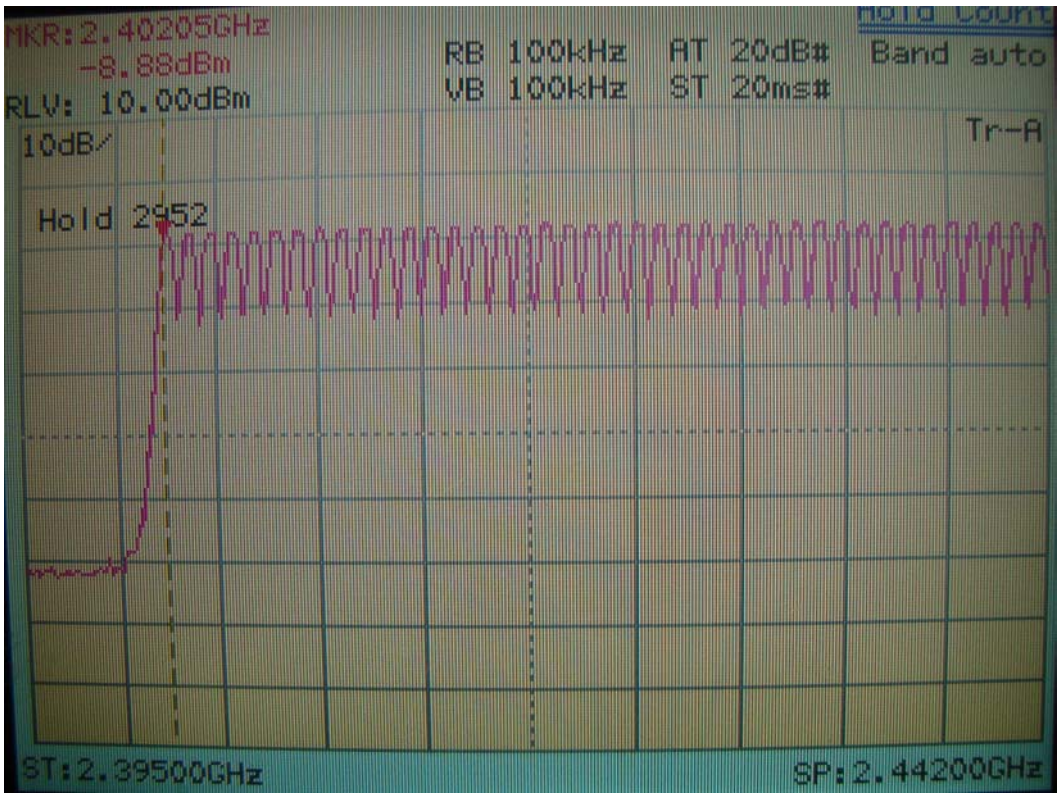
				Calibration Date
Instrument Name	**Model No.**	**Brand**	**Serial No.**	**Next time**
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08
Horn Antenna	3115	EMCO	9104-3668	12/14/08

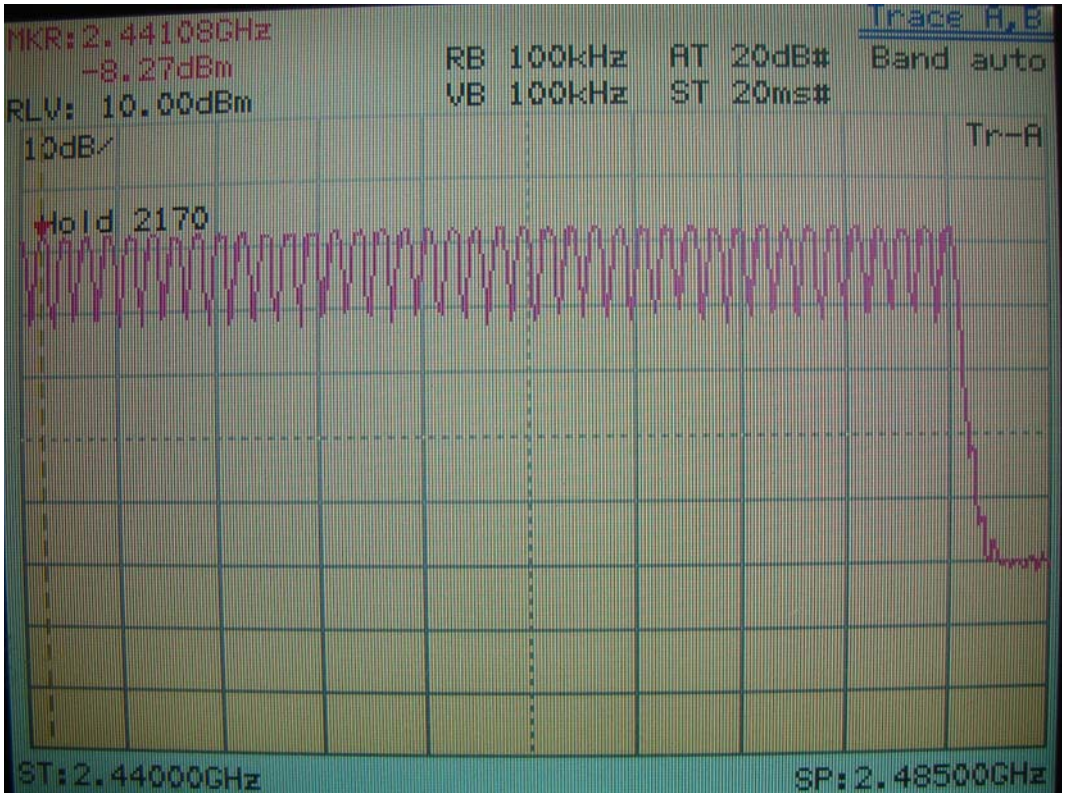
6.3 Test Instruments Configuration

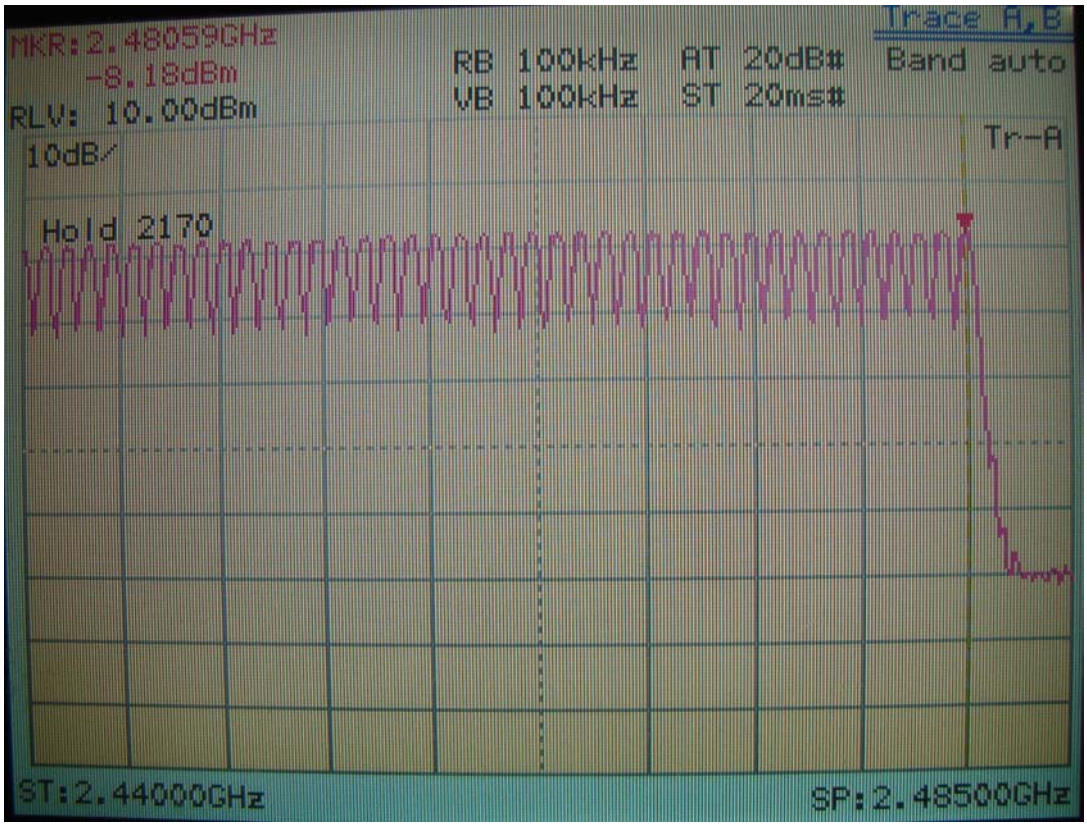


Test Configuration for number of hopping frequencies

6.4 Test Results




MKR:2.44108GHz
-8.27dBm
RLV: 10.00dBm
RB 100kHz AT 20dB#
VB 100kHz ST 20ms#
Trace A,B
Band auto
10dB/
Tr-A
Hold 2170
ST:2.44000GHz
SP:2.48500GHz


MKR:2.48059GHz
-8.18dBm
RLV: 10.00dBm
RB 100kHz AT 20dB#
VB 100kHz ST 20ms#
Trace A,B
Band auto
10dB/
Tr-A
Hold 2170
ST:2.44000GHz
SP:2.48500GHz

VII. Section 15.247(a)(1)(ii) Time of Occupancy (Dwell Time)

7.1 Test Condition

The EUT must have its hopping function enabled. Use the following spectrum analyzer setting:

Span = zero span, centered on a hopping channel

RBW = 1M

VBW ≧ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

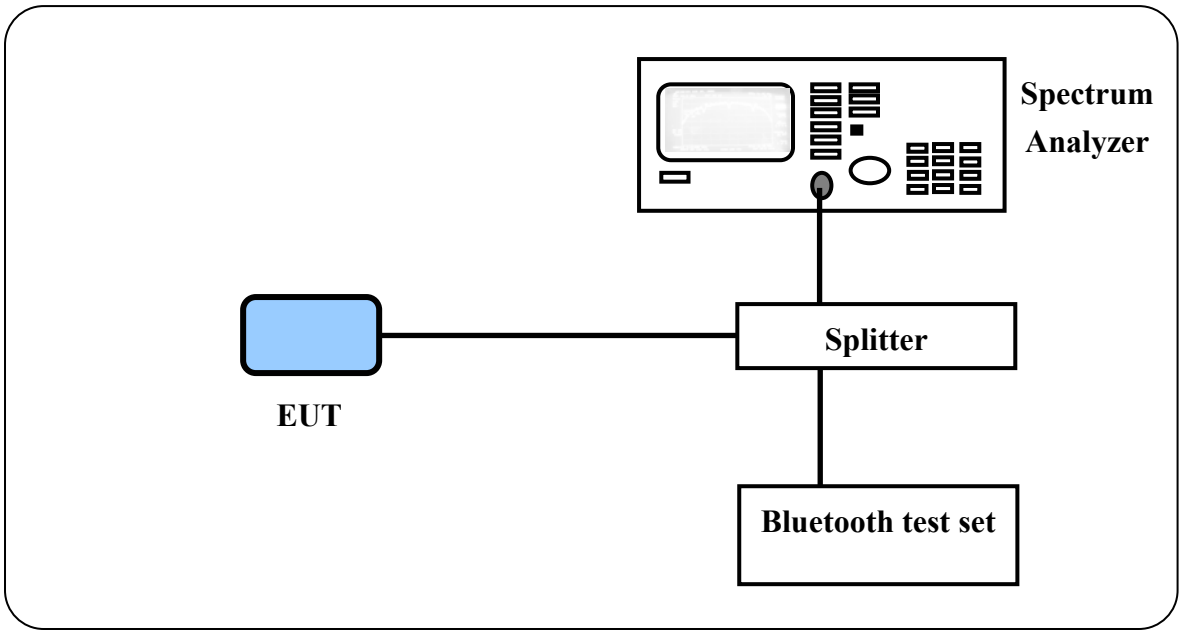
Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

7.2 List of Test Instruments

				Calibration Date
Instrument Name	**Model No.**	**Brand**	**Serial No.**	**Next time**
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08
Bluetooth Test Set	MT8852A	ANRITSU	6k00001241	N/A
RF Splitter	ZFSC-2-2500	MINI-CIRCUITS	SF863200403	N/A

7.3 Test Instruments Configuration



Note:

1. Running Bluetooth test set for Test mode.
2. Spectrum Analyzer record test results.

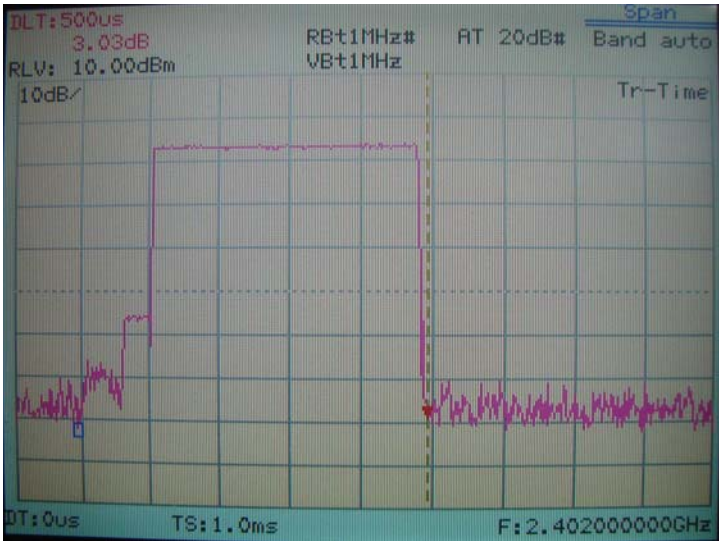
7.4 Test Results

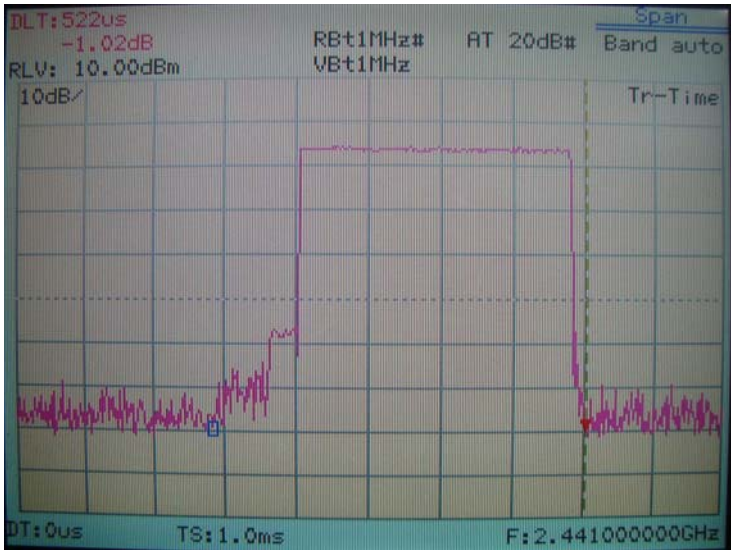
CH	DH1-Packet (ms)	DH3-Packet (ms)	DH5-Packet (ms)
01	0.500x31.6x10.12 = 159.90	1.788x31.6x5.06 = 285.89	3.03x31.6x3.37 = 322.67
40	0.522x31.6x10.12 = 166.93	1.768x31.6x5.06 = 282.70	3.02x31.6x3.37 = 321.61
79	0.500x31.6x10.12 = 159.90	1.768x31.6x5.06 = 282.70	3.03x31.6x3.37 = 322.67

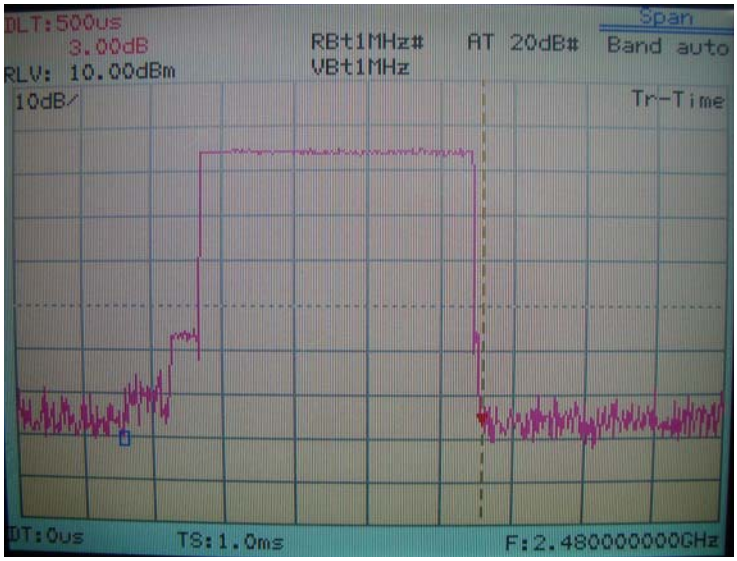
備註：1. 0.4 x 79 = 31.6 s

2. DH1: $1600 \div 79 \div 2 = 10.12$ ms
3. DH3: $1600 \div 79 \div 4 = 5.06$ ms
4. DH5: $1600 \div 79 \div 6 = 3.37$ ms
5. Show as following page.

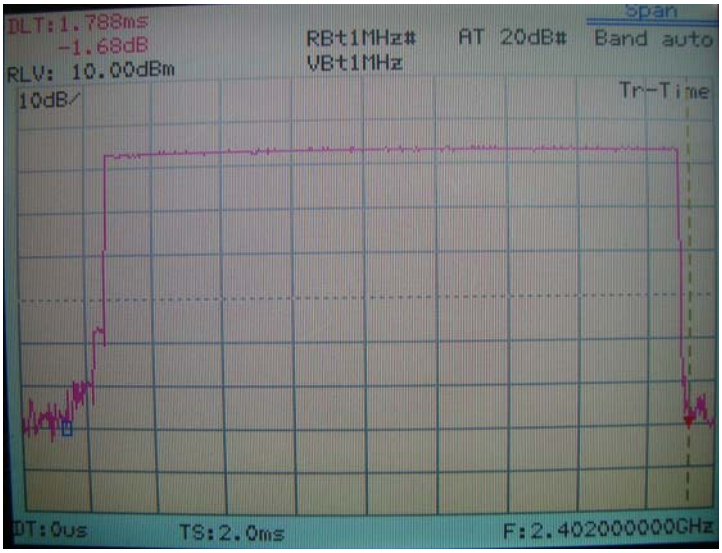
DH1-Packet：

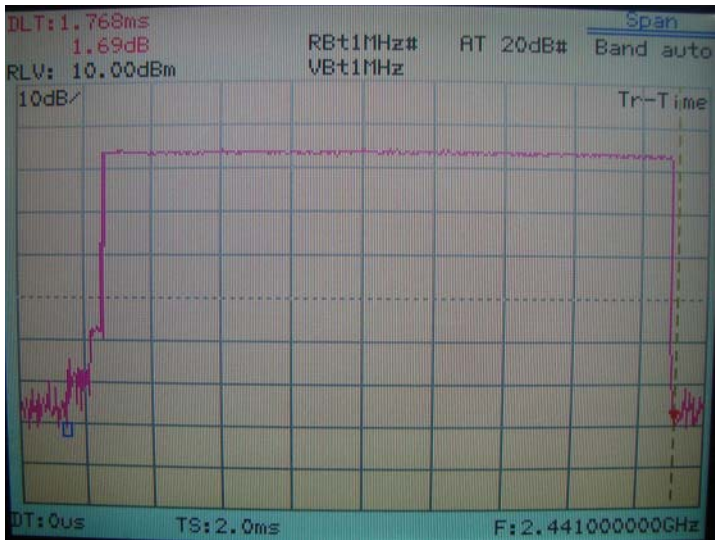

DLT:500us
3.03dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:1.0ms
F:2.402000000GHz


DLT:522us
-1.02dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:1.0ms
F:2.441000000GHz


DLT:500us
3.00dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:1.0ms
F:2.480000000GHz

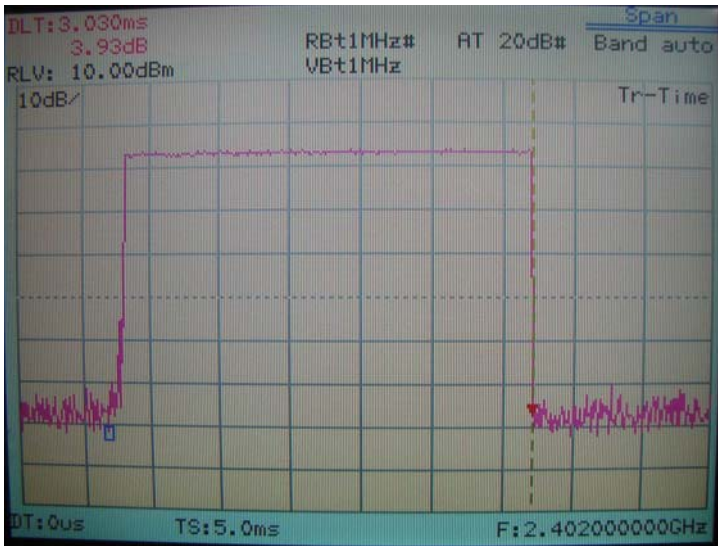
DH3-Packet：

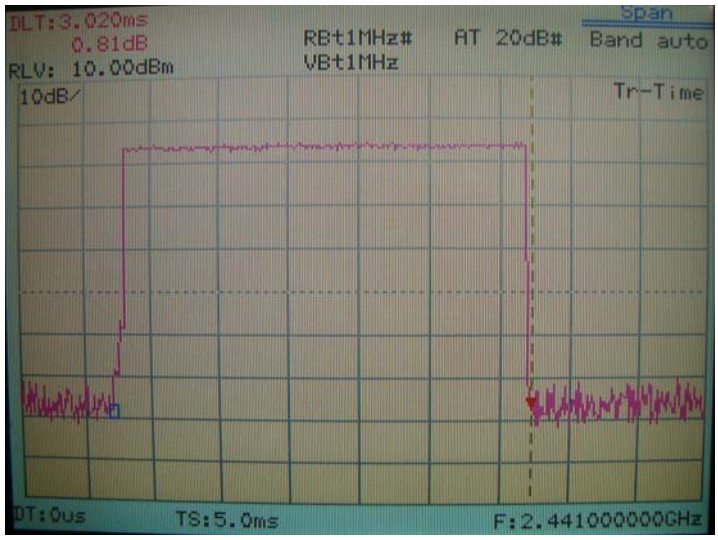

DLT:1.788ms
-1.68dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:2.0ms
F:2.402000000GHz

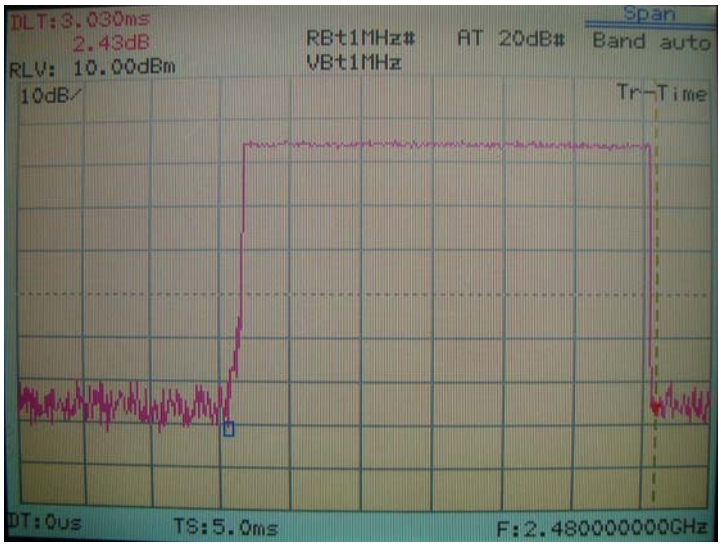

DLT:1.768ms
1.69dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:2.0ms
F:2.441000000GHz


DLT:1.768ms
-0.26dB
RLV: 10.00dBm
10dB/
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
Tr-Time
DT:0us
TS:2.0ms
F:2.480000000GHz

DH5-Packet：


DLT:3.030ms
3.93dB
RLV: 10.00dBm
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
10dB/
Tr-Time
DT:0us
TS:5.0ms
F:2.402000000GHz


DLT:3.020ms
0.81dB
RLV: 10.00dBm
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
10dB/
Tr-Time
DT:0us
TS:5.0ms
F:2.441000000GHz


DLT:3.030ms
2.43dB
RLV: 10.00dBm
RBt1MHz#
VBt1MHz
AT 20dB#
Span
Band auto
10dB/
Tr-Time
DT:0us
TS:5.0ms
F:2.480000000GHz

VIII. Section 15.247(a)(1)(ii) 20dB Bandwidth

8.1 Test Condition

Use the following spectrum analyzer setting:

Span = the frequency band of operation

RBW ≧ 1% of the emission bandwidth

VBW ≧ RBW

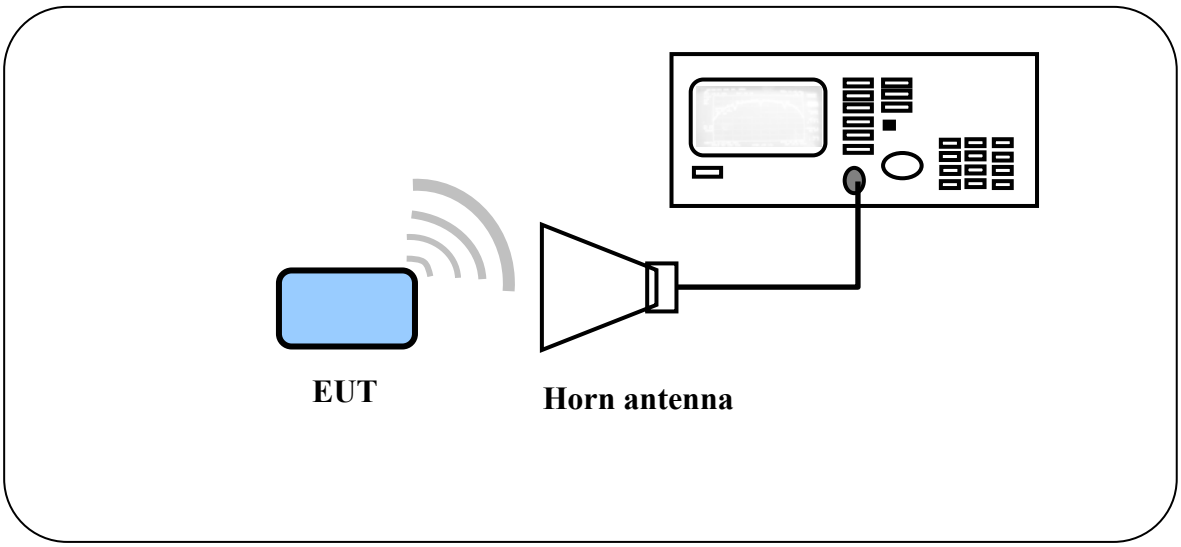
Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this section. Submit this plot(s).

8.2 Test Instruments Configuration



Test Configuration of Bandwidth for Frequency Hopping Spread Spectrum System

8.3 List of Test Instruments

Calibration Date

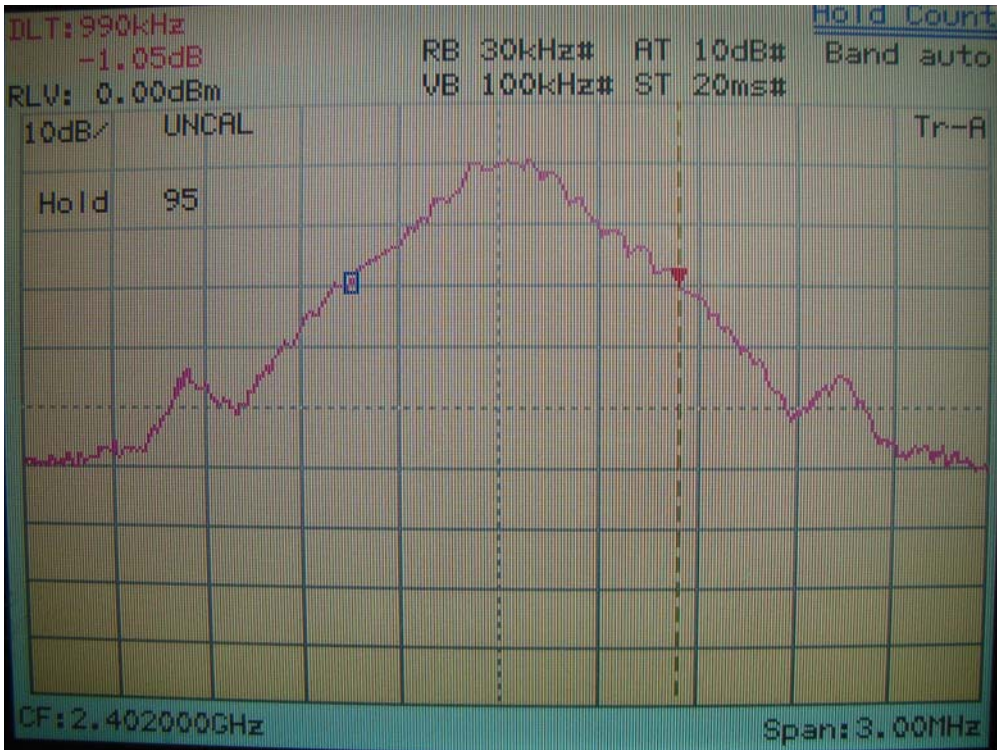
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08
Horn Antenna	3115	EMCO	9104-3668	12/14/08

8.4 Test Results

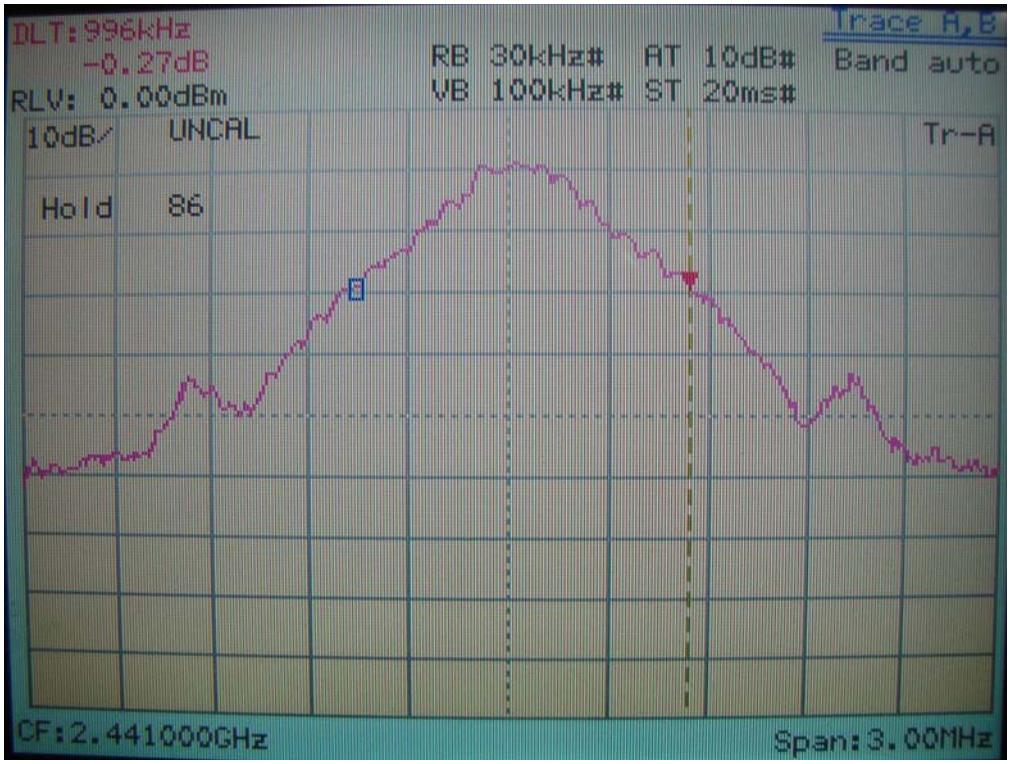
Channel	Bluetooth
01	990 kHz
40	996 kHz
79	996 kHz

Note:
The data in the above table are summarizing the following attachment spectrum analyzer.

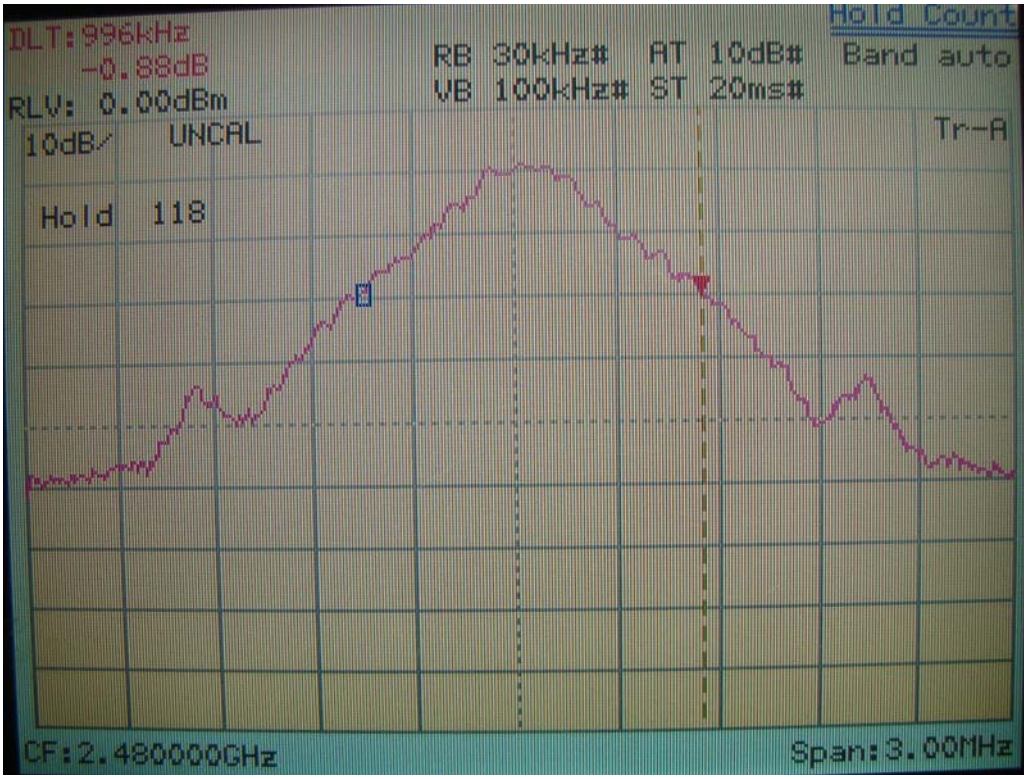
Bandwidth of Channel 1:



Bandwidth of Channel 40:

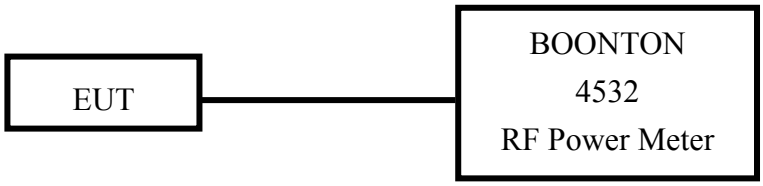


Bandwidth of Channel 79:



IX. Section 15.247(b) Peak Output Power

9.1 Test Condition & Setup



1. The output of the transmitter is connected to the BOONTON RF Power Meter.
2. The calibration is performed before every test. The values of the output power of the EUT will shown in the dBm directly are the transmitter output peak power. Recording as follows.

9.2 List of Test Instruments

Calibration Date

Instrument Name	Model No.	Brand	Serial No.	Next time
RF Power Meter	4532	BOONTON	117501	09/11/08
Peak Power Sensor	57340	BOONTON	2696	09/11/08

9.3 Test Result

Formula:

RF output power of EUT + |Cable loss| = Output peak power

Channel	RF Output	Cable Loss	Output Peak Power	
	dBm	dBm	dBm	mW
CH01	-5.32	1.50	-3.82	0.415
CH40	-4.90	1.50	-3.40	0.457
CH79	-4.87	1.50	-3.37	0.460

X. Section 15.247(c) Band-edge Compliance

10.1 Test Condition

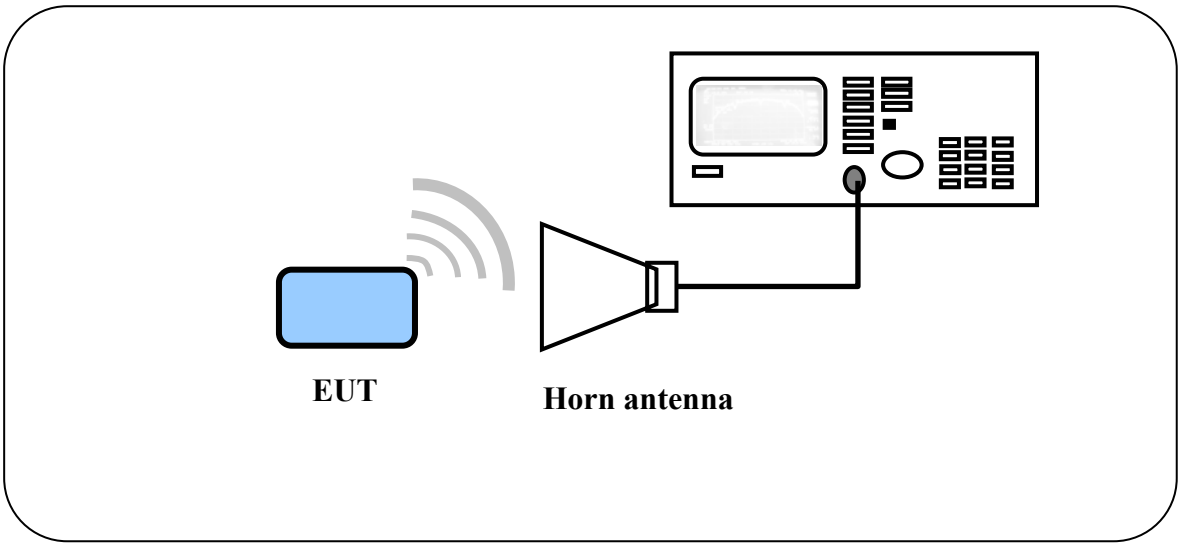
If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either *at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified id §15.209(a)*,

We perform this section by the *radiated manner*, the RBW is set to 100kHz and VBW>RBW. We'd made the observation *up to 10th harmonics and the criterion is all the harmonic/spurious emissions must be 20dB below the highest emission level measured.* If the emissions fall in the restricted bands stated in the Part15.205(a) must also *comply with the radiated emission limits specified in Part15.209(a). (Peak mode: RBW=VBW=1MHz, Average mode: RBW=1MHz; VBW=10Hz)*

10.2 List of Test Instruments

				Calibration Date
Instrument Name	**Model No.**	**Brand**	**Serial No.**	**Next time**
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08
Spectrum Analyzer	8564E	HP	3720A00840	11/07/08
Microwave Preamplifier	84125C	HP	US36433002	11/05/08
Horn Antenna	3115	EMCO	9104-3668	12/14/08

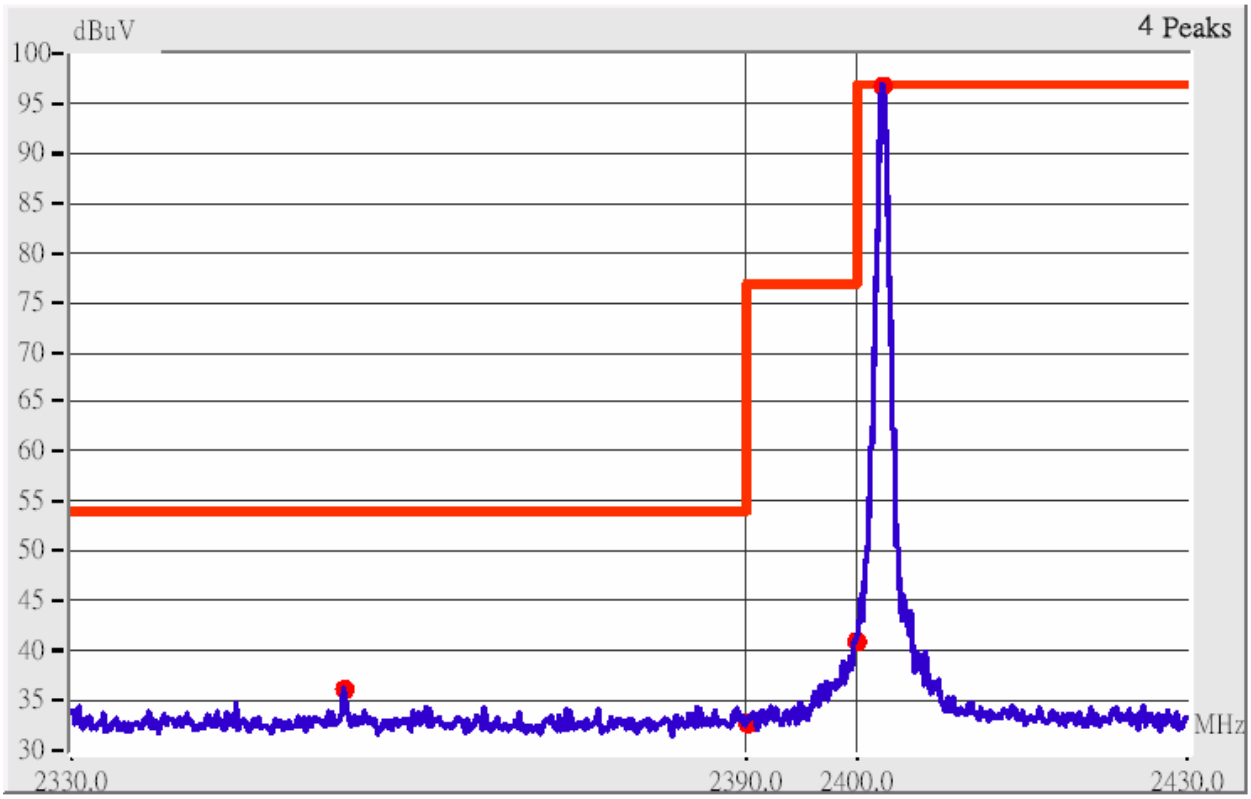
10.3 Test Instruments Configuration



10.4 Test Result of the Bandedge

The following pages show our observations referring to the channel 1 and 79 respectively.

Channel 1

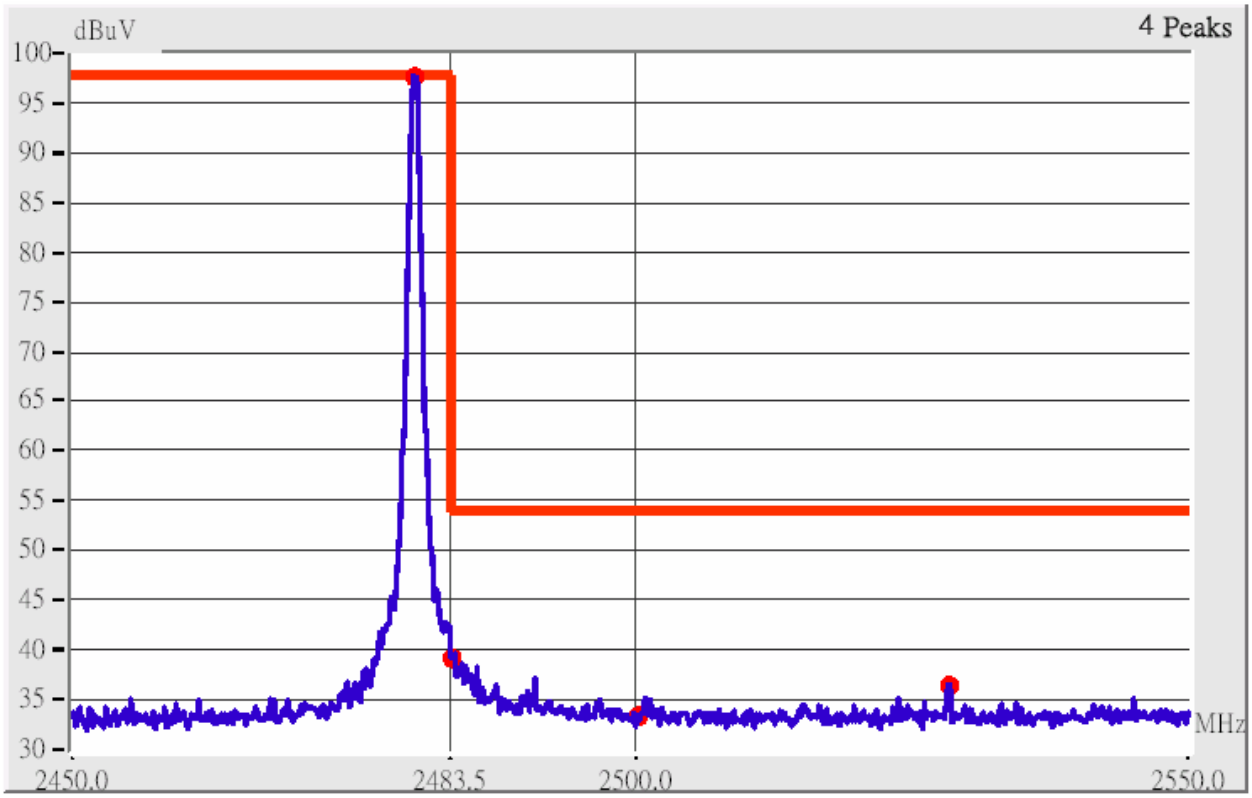


This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

1. The lobe left by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below.

Radiated Emission					*Corrected Amplitude (dBμV/m)*		*Class B*		
Frequency (MHz)	*Ant. P.*	*Ant. H. (m)*	*Table ( )*	*Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2381.40	Hor	1.00	124	9.16	43.49	---	74.00	53.96	-10.47
2390.02	Hor	1.00	249	9.18	42.52	---	74.00	53.96	-11.44
2374.31	Ver	1.00	31	9.14	44.30	---	74.00	53.96	-9.66
2390.02	Ver	1.00	67	9.18	43.02	---	74.00	53.96	-10.94

Channel 79



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 79.

3. The lobe left by the fundamental side is already 20dB below the highest emission level.
4. The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below.

Radiated Emission					*Corrected Amplitude (dBμV/m)*		*Class B*		
Frequency (MHz)	*Ant. P.*	*Ant. H. (m)*	*Table ( )*	*Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2483.50	Hor	1.00	101	9.44	52.11	---	74.00	53.96	-1.85
2493.18	Hor	1.00	102	9.47	45.64	---	74.00	53.96	-8.32
2500.01	Hor	1.00	261	9.49	42.32	---	74.00	53.96	-11.64
2508.06	Hor	1.00	325	9.51	44.51	---	74.00	53.96	-9.45
2483.50	Ver	1.00	170	9.44	52.61	---	74.00	53.96	-1.35
2487.93	Ver	1.00	175	9.46	46.62	---	74.00	53.96	-7.34
2500.01	Ver	1.00	241	9.49	42.66	---	74.00	53.96	-11.30
2515.47	Ver	1.00	274	9.52	42.85	---	74.00	53.96	-11.11

XI. Section 15.247(c) Spurious Radiated Emissions

11.1 Test Condition and Setup

We'd performed the test by the *radiated emission* skill: The EUT was placed in an anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions was noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we'd set the spectrum analyzer's 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT. Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 85460A EMI Receiver, SCHWARZECK whole range Small Biconical Antenna (Model No.: UBAA9114 & BBVU9135) is used to measure frequency from 30 MHz to 1GHz. The final test is used the HP 85460A spectrum and 8564E spectrum was examined from 1GHz to 25GHz using an Hewlett Packard Spectrum Analyzer, EMCO/HP Horn Antenna (Model 3115 / 84125-80008) for 1G to 25GHz.

At each frequency, the EUT was rotated 360 degrees, stand on **three orthogonal** planes respectively and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 25GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 120KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 25GHz) and the analyzer was operated in the maximum hold mode. There is a test condition applies in this test item, the test procedure description as the following:

Three channels were tested, one in the top (CH1), one in the middle (CH40) and the other in bottom (CH79). The setting up procedure is recorded on <1.3 test method>

With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the 2400 ~ 2483.5 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBμV/m) is determined by algebraically adding the measured reading in dBμV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBμV) + Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

For frequency between 1GHz to 25GHz

FIa (dBμV/m) = FIr (dBμV) + Correction Factor

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

11.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/05/08
RF Filter Section	85460A	HP	3448A00217	09/05/08
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	09/07/08
Pre-amplifier	PA1F	TRC	1FAC	08/08/08
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	08/08/08
Coaxial Cable (Double shielded, 15 Meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	08/08/08
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	03/17/09
Spectrum Analyzer	8564E	HP	3720A00840	11/07/08
Microwave Preamplifier	84125C	HP	US36433002	11/05/08
Horn Antenna	3115	EMCO	9104-3668	12/14/08
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	12/14/08
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	08/12/08
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	10/10/08
Pre-amplifier	PA2F	TRC	2F1GZ	10/10/08
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	10/10/08
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	09/05/08

11.3 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following. (worst case)

Test Conditions: Temperature : 25° C Humidity : 73% RH

Test mode: BT CH01 for 30MHz to 1GHz [Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
193.69	39.37	1.00	177	-3.58	35.79	43.50	-7.71
217.94	43.18	1.00	187	-3.72	39.46	46.00	-6.54
242.19	42.34	1.00	187	-3.61	38.73	46.00	-7.27
362.22	44.51	1.00	129	-1.98	42.53	46.00	-3.47
396.17	44.30	1.00	292	-1.17	43.13	46.00	-2.87
420.42	43.14	1.00	292	-0.15	42.99	46.00	-3.01

Test mode: BT CH01 for 30MHz to 1GHz [Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
134.27	28.68	1.00	153	-3.21	25.47	43.50	-18.03
289.47	32.26	1.00	247	-3.38	28.88	46.00	-17.12
373.14	33.64	1.00	267	-1.72	31.92	46.00	-14.08
445.89	32.23	1.00	237	1.00	33.23	46.00	-12.77
481.05	28.11	1.00	230	1.53	29.64	46.00	-16.36
528.34	25.80	1.00	262	3.62	29.42	46.00	-16.58

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain) + Switching Box Loss

Test mode: BT CH01 for 1GHz to 25GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
1602.08	1.00	343	37.66	---	14.30	51.96	---	73.96	53.96	-2.00
2304.17	1.00	265	37.00	---	8.94	45.94	---	73.96	53.96	-8.02
12012.71	1.00	164	36.77	---	10.01	46.78	---	73.96	53.96	-7.18
19214.79	1.00	295	47.29	---	1.60	48.89	---	73.96	53.96	-5.07
21619.58	1.00	67	45.70	---	2.79	48.49	---	73.96	53.96	-5.47
24020.83	1.00	320	46.55	---	3.14	49.69	---	73.96	53.96	-4.27

Test mode: BT CH01 for 1GHz to 25GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
2497.92	1.00	50	36.17	---	9.48	45.65	---	73.96	53.96	-8.31
3058.33	1.00	3	35.33	---	10.71	46.04	---	73.96	53.96	-7.92
12012.71	1.00	273	37.44	---	10.01	47.45	---	73.96	53.96	-6.51
19214.79	1.00	277	47.21	---	1.60	48.81	---	73.96	53.96	-5.15
21619.58	1.00	47	45.61	---	2.79	48.40	---	73.96	53.96	-5.56
24020.83	1.00	332	46.57	---	3.14	49.71	---	73.96	53.96	-4.25

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF radiated emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

Test mode: BT CH40 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
243.40	43.26	1.00	316	-3.54	39.72	46.00	-6.28
314.94	46.36	1.00	188	-2.71	43.65	46.00	-2.35
350.10	47.12	1.00	199	-2.27	44.85	46.00	-1.15
362.22	46.68	1.00	199	-1.98	44.70	46.00	-1.30
422.85	43.90	1.00	299	-0.04	43.86	46.00	-2.14
458.01	41.45	1.00	289	1.28	42.73	46.00	-3.27

Test mode: BT CH40 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
135.49	32.48	1.00	153	-3.26	29.22	43.50	-14.28
157.31	33.89	1.00	143	-4.14	29.75	43.50	-13.75
348.89	34.94	1.00	267	-2.28	32.66	46.00	-13.34
385.26	34.57	1.00	257	-1.43	33.14	46.00	-12.86
528.34	32.30	1.00	325	3.62	35.92	46.00	-10.08
599.87	31.04	1.00	360	6.46	37.50	46.00	-8.50

Test mode: BT CH40 for 1GHz to 25GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
2158.33	1.00	149	39.84	---	8.53	48.37	---	73.96	53.96	-5.59
9765.21	1.00	182	34.78	---	11.90	46.68	---	73.96	53.96	-7.28
12206.04	1.00	79	39.61	---	9.79	49.40	---	73.96	53.96	-4.56
19526.46	1.00	319	46.17	---	1.70	47.87	---	73.96	53.96	-6.09
21970.21	1.00	199	45.71	---	2.95	48.66	---	73.96	53.96	-5.30
24410.42	1.00	123	46.33	---	3.10	49.43	---	73.96	53.96	-4.53

Test mode: BT CH40 for 1GHz to 25GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
2535.42	1.00	78	37.33	---	9.56	46.89	---	73.96	53.96	-7.07
9765.21	1.00	50	34.94	---	11.90	46.84	---	73.96	53.96	-7.12
12206.04	1.00	51	38.11	---	9.79	47.90	---	73.96	53.96	-6.06
19526.46	1.00	307	45.88	---	1.70	47.58	---	73.96	53.96	-6.38
21970.21	1.00	196	45.83	---	2.95	48.78	---	73.96	53.96	-5.18
24410.42	1.00	118	46.24	---	3.10	49.34	---	73.96	53.96	-4.62

Test mode: BT CH79 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
124.57	27.45	1.00	64	-2.68	24.77	43.50	-18.73
226.42	29.11	1.00	320	-3.79	25.32	46.00	-20.68
301.60	31.94	1.89	330	-2.88	29.06	46.00	-16.94
427.70	39.04	1.00	289	0.18	39.22	46.00	-6.78
460.44	37.78	1.00	202	1.30	39.08	46.00	-6.92
534.40	30.07	1.00	298	4.02	34.09	46.00	-11.91

Test mode: BT CH79 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
156.10	32.95	1.00	94	-4.18	28.77	43.50	-14.73
237.34	32.17	1.00	336	-3.76	28.41	46.00	-17.59
376.77	45.26	1.00	17	-1.63	43.63	46.00	-2.37
528.34	31.43	1.00	311	3.62	35.05	46.00	-10.95
597.45	27.41	1.00	357	6.39	33.80	46.00	-12.20
665.35	28.21	1.00	315	8.48	36.69	46.00	-9.31

Test mode: BT CH79 for 1GHz to 25GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
2158.33	1.00	107	40.50	---	8.53	49.03	---	73.96	53.96	-4.93
9922.29	1.00	15	35.11	---	11.66	46.77	---	73.96	53.96	-7.19
12399.37	1.00	270	38.77	---	9.02	47.79	---	73.96	53.96	-6.17
19799.17	1.00	331	46.79	---	1.90	48.69	---	73.96	53.96	-5.27
22320.83	1.00	75	45.06	---	3.33	48.39	---	73.96	53.96	-5.57
24800.00	1.00	43	47.08	---	2.22	49.30	---	73.96	53.96	-4.66

Test mode: BT CH79 for 1GHz to 25GHz [Vertical]

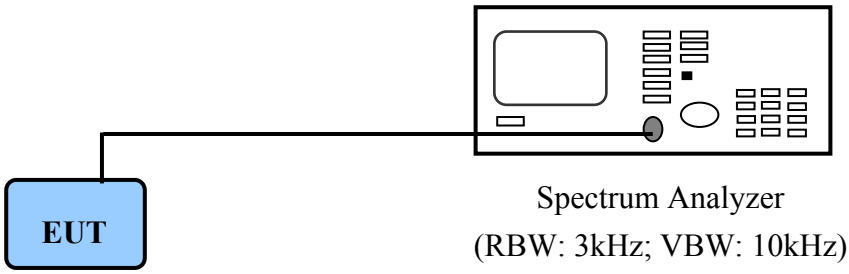
Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
2575.00	1.00	41	36.33	---	9.63	45.96	---	73.96	53.96	-8.00
9922.29	1.00	244	33.94	---	11.66	45.60	---	73.96	53.96	-8.36
12399.37	1.00	201	36.60	---	9.02	45.62	---	73.96	53.96	-8.34
19799.17	1.00	337	46.64	---	1.90	48.54	---	73.96	53.96	-5.42
22320.83	1.00	85	45.25	---	3.33	48.58	---	73.96	53.96	-5.38
24800.00	1.00	45	47.16	---	2.22	49.38	---	73.96	53.96	-4.58

XII. Section 15.247(d): Power Spectral Density

12.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power in TDD mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

12.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

12.3 List of Test Instruments

				Calibration Date
Instrument Name	**Model No.**	**Brand**	**Serial No.**	**Next time**
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	12/19/08

12.4 Test Result of Power spectral density

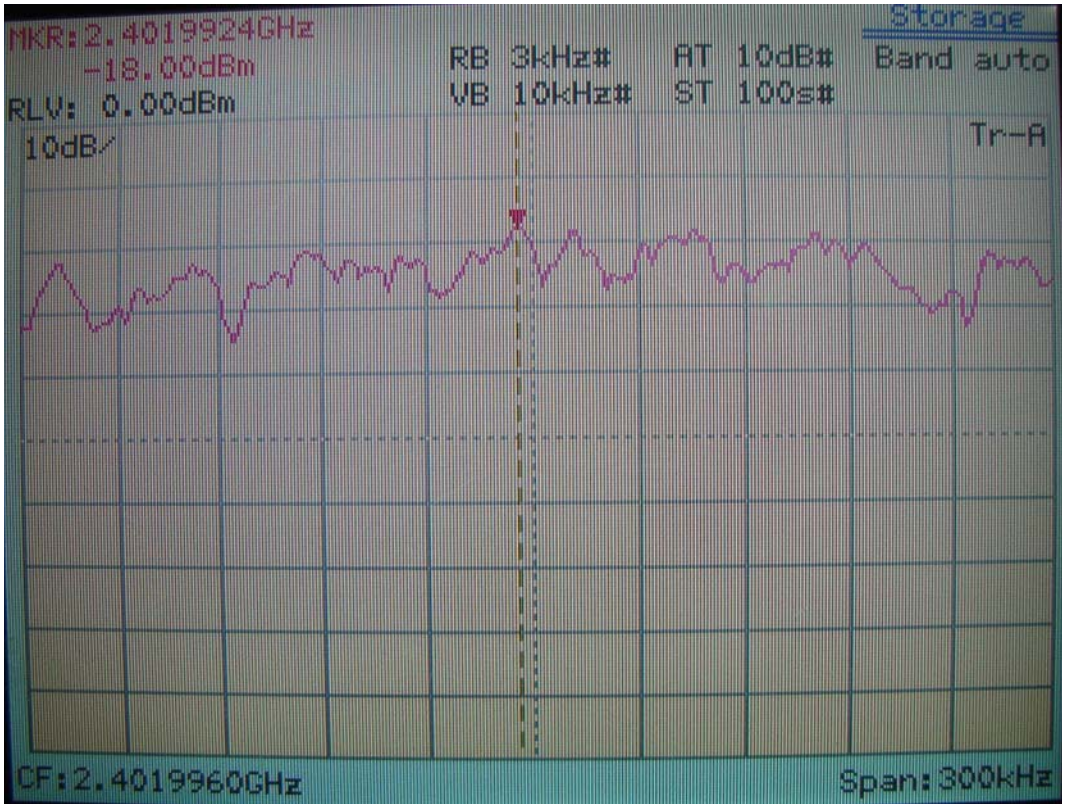
The following table shows a summary of the test results of the Power Spectral Density.

Channel	*Ppr (dBm)*	*Cable Loss (dB)*	*Ppq (dBm)*	*Limit (dB)*	*Margin (dB)*
CH 01	-18.00	1.50	-16.50	8.00	-24.50
CH 40	-17.43	1.50	-15.93	8.00	-23.93
CH 79	-17.51	1.50	-16.01	8.00	-24.01

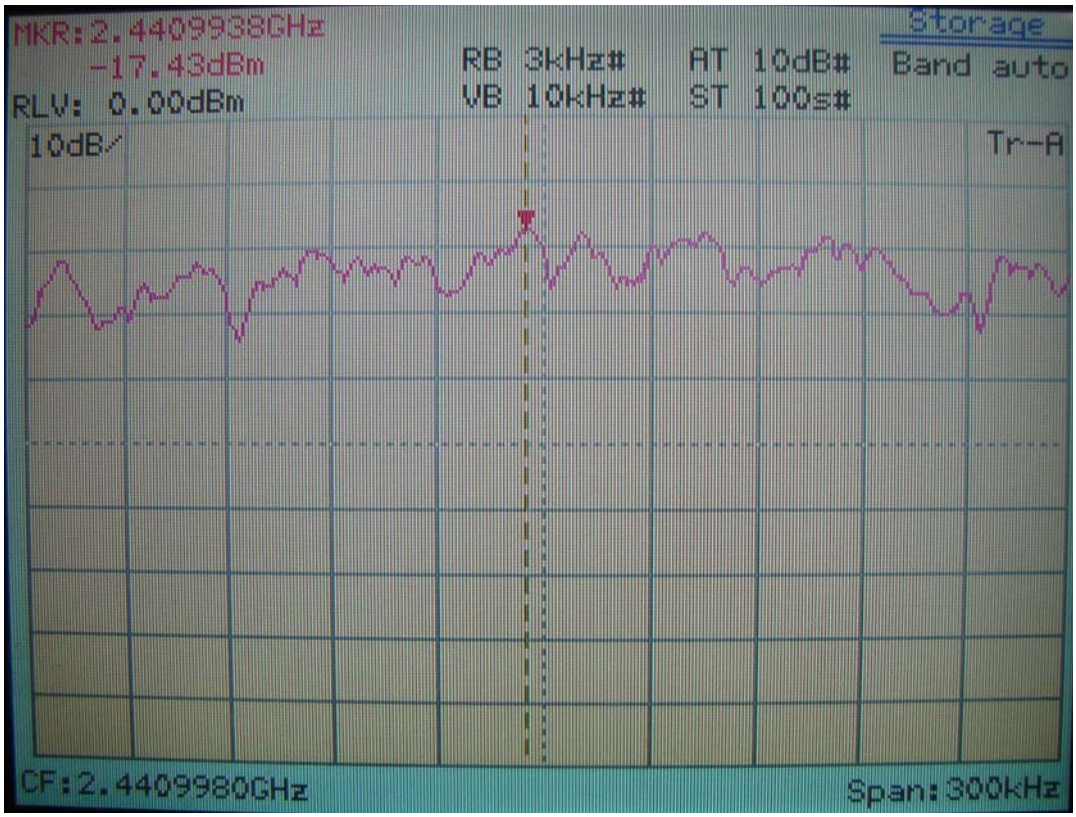
Note:

1. The following pages show the results of spectrum reading.
2. Ppr: spectrum read power density (using peak search mode),
   Ppq: actual peak power density in the spread spectrum band.
3. Ppq = Ppr + |Cable Loss|

Power Spectral Density for CH01



Power Spectral Density for CH40



Power Spectral Density for CH79