CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: ET94S-06-118-01

Client:	Toong In Electronic Corp.
Product:	Bluetooth Headset
Model:	HP-BT5R
FCC ID:	TE2HP-BT5R
Manufacturer/supplier:	DATA TARGET ELECTRONIC LTD

Date test item received:	2005/06/07
Date test campaign completed:	2005/06/24
Date of issue:	2005/08/03

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Total number of pages of this test report: 81 pages

Total number of pages of photos: External photos 1 pages

Internal photos 4 pages

Setup photos 4 pages

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TEST REPORT CERTIFICATION

Client	: Toong In Electronic Corp.
Address	: 10F-8, No. 738, Chung Cheng Road, Chung Ho City, Taipei, Taiwan
Manufacturer	: DATA TARGET ELECTRONIC LTD
Address	: Vill. 4, SHRY JYE DISTRICT, SHRY JYE TOWN, DONG GUAN CITY, GUANG DONG, CHINA
EUT	: Bluetooth Headset
Trade name	: ----
Model No.	: HP-BT5R
Power Source	: Battery 3.7Vdc / Charge from USB cable (5Vdc)
Regulations applied	: FCC 47 CFR, Part 15 Subpart C (2005)

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

The compliance test is only certified for the test equipment and the results of the testing report relate only to the item tested. The compliance test of this report was conducted in accordance with the appropriate standards. It's not intention to assure the quality and performance of the product. This report shall not be reproduced except in full, without the approval of ETC. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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① ISO9001: TüV Product Service

② ISO/IEC 17025: BSMI, CNLA, DGT, NVLAP, CCIBLAC, UL, Compliance

③ Filing: FCC, Industry Canada, VCCI

④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through CNLA

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 Headset
b) Trade Name : ----
c) Model No. : HP-BT5R
d) Power Supply : Battery 3.7Vdc / Charge from USB cable (5Vdc)

1.2 Characteristics of Device

The EUT is a Bluetooth Headset 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 –2.11 dBm (0.615 mW).

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 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.

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 μV	Average dB μV
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 μV/m	Radiated μV/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 seperated 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 Seperation

According to 15.247(a)(1)(iii), the frequency hopping systems shall have hopping channel carrier frequencies seperated 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 them 8dBm in any 3kHz band during any time interral 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

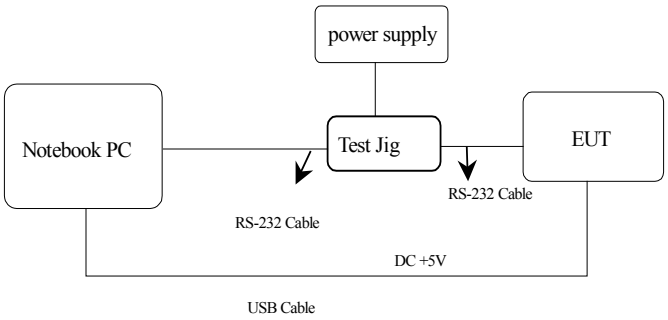
3.1 Justification

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 hightest, middle and lowest frequency and transmit the maximun 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 Headset	DATA TARGET ELECTRONIC LTD	HP-BT5R	0.8m*1, Unshielded USB Cable
Notebook PC	ASUS	L7300	3.3m*1, Unshielded Power Line (Adaptor) 1.8m*1, Unshielded Signal Line (RS232)
Power Supply	GW	GPS 3030D	1.7m*1, Unshielded DC Power Line
Test Jig	----	----	1.6m*1, Unshielded DC Power Line 1.8m*1, Unshielded Signal Line (RS232)

Remark "*" means equipment under test.



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 portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X,Y and Z 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

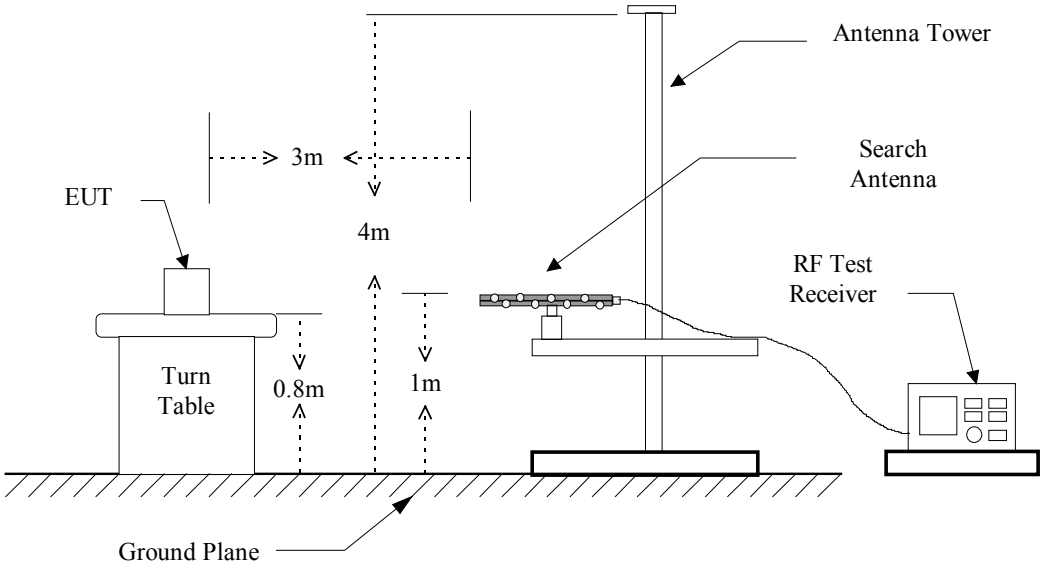
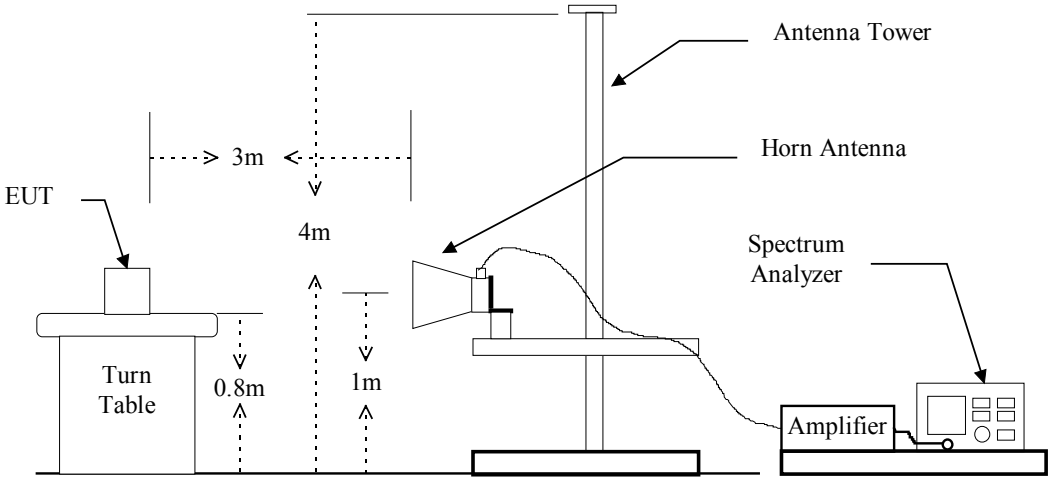


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Next Cal. Due
EMI Test Receiver	Hewlett-Packard	8546A	08/27/2005
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005
Horn Antenna	EMCO	3115	06/05/2006
LogBicone Antenna	Schwarzbeck	9160	10/28/2005
Horn Antenna	EMCO	3116	06/28/2006
Preamplifier	Hewlett-Packard	8449B	09/04/2005

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

a) Channel 0

Operation Mode : Transmitting
Fundamental Frequency : 2402 MHz
Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1201.000	---	---	---	---	-12.9	---	---	74.0	54.0
4804.000	---	---	---	---	0.5	---	---	74.0	54.0
12010.000	---	---	---	---	10.5	---	---	74.0	54.0
16216.000	---	---	---	---	13.3	---	---	74.0	54.0

b) Channel 39

Fundamental Frequency : 2441 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1220.500	---	---	---	---	-12.9	---	---	74.0	54.0
4882.000	---	---	---	---	0.5	---	---	74.0	54.0
7323.000	---	---	---	---	3.7	---	---	74.0	54.0
12205.000	---	---	---	---	5.8	---	---	74.0	54.0
19528.000	---	---	---	---	13.3	---	---	74.0	54.0

c) Channel 78

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1240.000	---	---	---	---	-12.9	---	---	74.0	54.0
4960.000	---	---	---	---	0.5	---	---	74.0	54.0
7440.000	---	---	---	---	3.7	---	---	74.0	54.0
12400.000	---	---	---	---	5.8	---	---	74.0	54.0
19840.000	---	---	---	---	13.3	---	---	74.0	54.0
22320.000	---	---	---	---	13.5	---	---	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 Emission

4.4.2.1

Operation Mode: 2402 MHz

Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

A. below 1GHz

Emission Frequency (MHz)	H / V	READING (dBuV)	CORR'd Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margins (dB)
90.140	H	17.2#	10.1	27.3#	43.5	-16.2
92.080	V	21.7#	10.1	31.8#	43.5	-11.7
153.190	V	15.3#	15.1	30.4#	43.5	-13.1
342.340	H	18.5#	18.1	36.6#	46.0	-9.4
356.890	V	17.3#	18.1	35.4#	46.0	-10.6
381.140	H	18.0#	18.8	36.8#	46.0	-9.2
536.340	V	16.7#	22.3	39.0#	46.0	-7.0
596.480	V	16.1#	23.8	39.9#	46.0	-6.1
620.730	V	16.0#	24.5	40.5#	46.0	-5.5
640.130	H	11.4#	25.2	36.6#	46.0	-9.4
858.380	H	12.2#	28.0	40.2#	46.0	-5.8
963.140	H	9.7#	30.1	39.8#	46.0	-6.2

B. above 1GHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1091.987	---	---	55.2	45.3	-12.9	42.3	32.4	74.0	54.0

Note :

1. Remark "***" means that the emissions level is too low to be measured.
2. Remark "#" means the noise was low, so record the peak value.
3. Item "Margin" referred to Q.P. limit while there is only peak result.

4.4.2.2

Operation Mode: 2441 MHz

Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

A. below 1GHz

Emission Frequency (MHz)	H / V	READING (dBuV)	CORR'd Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margins (dB)
30.000	V	13.3#	13.1	26.4#	40.0	-13.6
353.980	V	17.5#	18.1	35.6#	46.0	-10.4
356.890	H	20.7#	18.1	38.8#	46.0	-7.2
405.390	H	17.3#	19.4	36.7#	46.0	-9.3
512.090	V	16.2#	21.5	37.7#	46.0	-8.3
536.340	V	16.7#	22.3	39.0#	46.0	-7.0
615.880	H	13.8#	24.5	38.3#	46.0	-7.7
620.730	V	15.6#	24.5	40.1#	46.0	-5.9
727.430	V	11.6#	26.6	38.2#	46.0	-7.8
856.440	H	12.1#	28.0	40.1#	46.0	-5.9
943.740	H	10.5#	29.9	40.4#	46.0	-5.6
965.080	H	11.3#	30.1	41.4#	46.0	-4.6

B. above 1GHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1091.987	---	---	55.3	45.7	-12.9	42.4	32.8	74.0	54.0

Note :

1. Remark "***" means that the emissions level is too low to be measured.
2. Remark "#" means the noise was low, so record the peak value.
3. Item "Margin" referred to Q.P. limit while there is only peak result.

4.4.2.3

Operation Mode: 2480 MHz

Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

A. below 1GHz

Emission Frequency (MHz)	**H / V**	**READING (dBuV)**	**CORR'd Factor (dB)**	**Result (dBuV)**	**Limit (dBuV/m)**	**Margins (dB)**
31.940	V	12.2#	13.1	25.3#	40.0	-14.7
356.890	H	20.3#	18.1	38.4#	46.0	-7.6
356.890	V	17.7#	18.1	35.8#	46.0	-10.2
405.390	H	17.1#	19.4	36.5#	46.0	-9.5
450.980	V	16.5#	20.7	37.2#	46.0	-8.8
533.430	H	13.7#	22.3	36.0#	46.0	-10.0
560.590	V	16.6#	22.9	39.5#	46.0	-6.5
615.880	V	16.3#	24.5	40.8#	46.0	-5.2
727.430	V	12.8#	26.6	39.4#	46.0	-6.6
834.130	H	11.4#	27.8	39.2#	46.0	-6.8
858.380	H	11.5#	28.0	39.5#	46.0	-6.5
965.080	H	9.9#	30.1	40.0#	46.0	-6.0

B. above 1GHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
1091.987	---	---	55.3	45.7	-12.9	42.4	32.8	74.0	54.0

Note :

1. Remark "***" means that the emissions level is too low to be measured.
2. Remark "#" means the noise was low, so record the peak value.
3. Item "Margin" referred to Q.P. limit while there is only peak result.

4.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies

(A)

Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

Frequency	Reading (dBuV)				Factor	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V		(dB)	Peak	Ave	Peak	Ave.
(MHz)	Peak	Ave	Peak	Ave	Corr.	(H/V Max.)			
2387.979	27.3	13.8	27.0	13.8	30.3	57.6	44.1	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

Test Date : Jun. 20, 2005 Temperature : 23℃ Humidity : 53%

Frequency	Reading (dBuV)				Factor	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V		(dB)	Peak	Ave	Peak	Ave.
(MHz)	Peak	Ave	Peak	Ave	Corr.	(H/V Max.)			
2483.500	32.2	14.6	30.8	14.5	30.3	62.5	44.9	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:

Result = Reading + Corrected Factor

where

Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain

5 CONDUCTED EMISSION MEASUREMENT

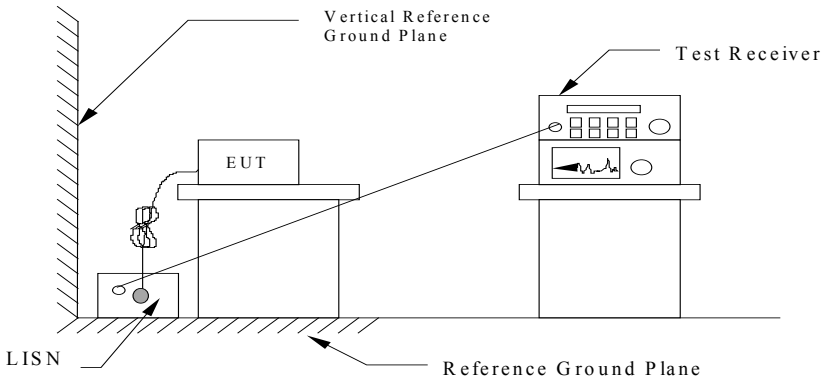
5.1 Standard Applicable

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

5.3.1
Operation Mode: 2402 MHz

Test Date : Jun. 23, 2005 Temperature : 23℃ Humidity : 56%

Freq. (MHz)	**Meter Reading** (dBuV)				**Factor** (dB)	**Result** (dBuV)				**Limit** (dBuV)		**Margins** (dB)
	Q.P Value		AVG. Value			Q.P Value		AVG. Value		Q.P Value	AVG. Value	Q.P. or AVG.
	L1	L2	L1	L2		L1	L2	L1	L2			
0.209	***	34.6	----	----	0.2	***	34.8	----	----	63.2	53.2	-28.4
0.341	40.3	40.4	----	----	0.2	40.5	40.6	----	----	59.2	49.2	-18.6
0.412	46.5	46.5	----	----	0.2	46.7	46.7	----	----	57.6	47.6	-10.9
0.478	46.0	46.0	----	----	0.2	46.2	46.2	----	----	56.4	46.4	-10.2
0.684	39.2	***	----	----	0.2	39.4	***	----	----	56.0	46.0	-16.6
0.754	***	39.3	----	----	0.2	***	39.5	----	----	56.0	46.0	-16.5
0.820	39.5	39.5	----	----	0.2	39.7	39.7	----	----	56.0	46.0	-16.3
0.891	38.1	***	----	----	0.2	38.3	***	----	----	56.0	46.0	-17.7

Note:

1. "***" means the value was too low to be measured.
2. 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.
3. "#" means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is ±2.5dB.
5. Please refer to page 22 to page 23 for chart.

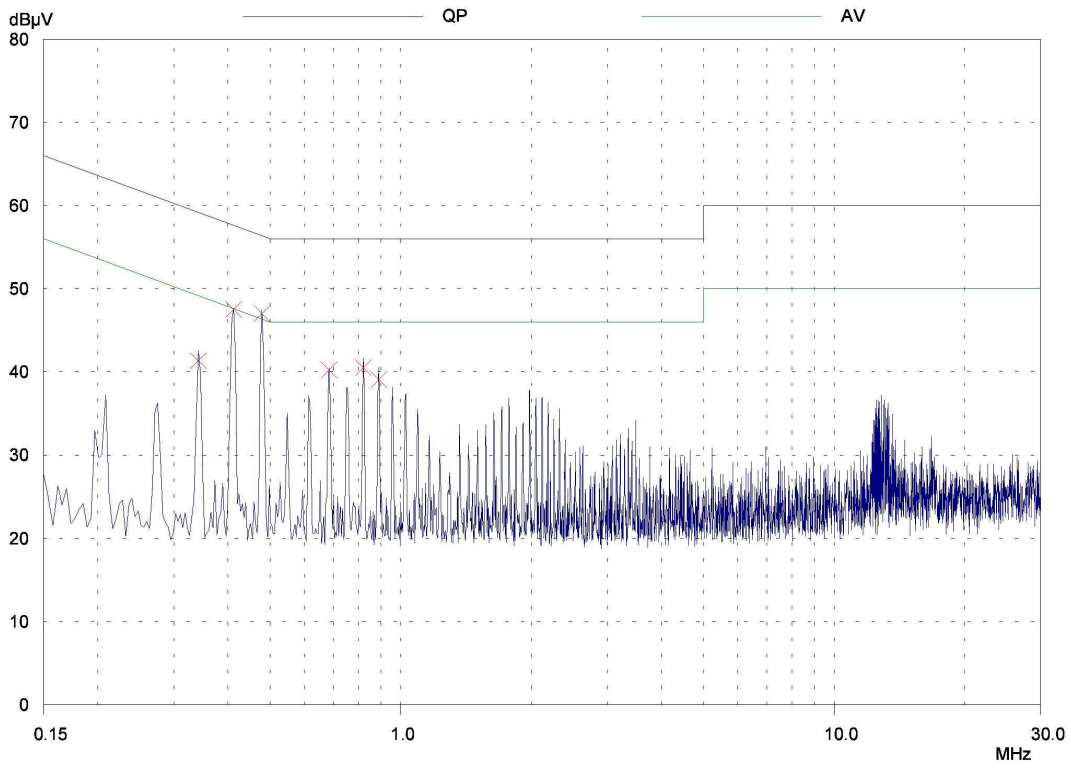
CONDUCTED EMISSION TEST

PEAK VALUE

EUT:
Manuf:
Op Cond: TX CH00
Operator: JAMES
Test Spec: FCC
Comment: L1

Result File: ce_l1.dat :

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 6 dB



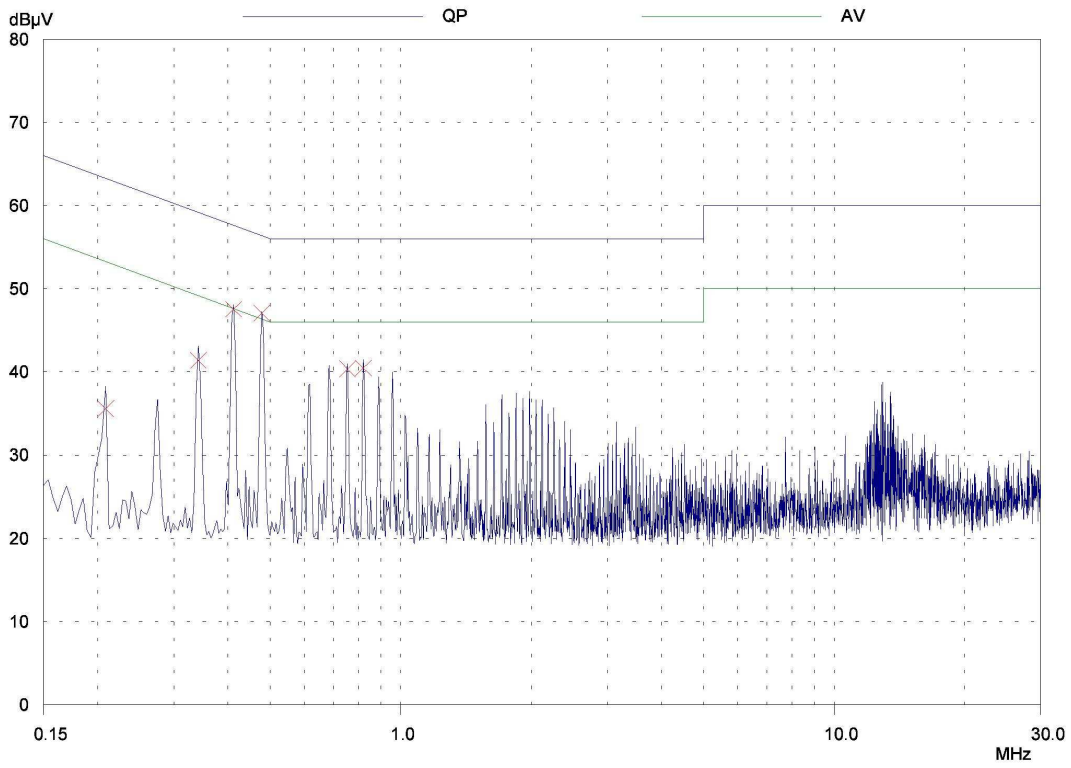
CONDUCTED EMISSION TEST

PEAK VALUE

EUT:
Manuf:
Op Cond: TX CH00
Operator: JAMES
Test Spec: FCC
Comment: L2

Result File: ce_l2.dat :

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 6 dB



5.3.2
Operation Mode: 2441 MHz

Test Date : Jun. 23, 2005 Temperature : 23℃ Humidity : 56%

Freq. (MHz)	**Meter Reading** (dBuV)				**Factor** (dB)	**Result** (dBuV)				**Limit** (dBuV)		**Margins** (dB)
	Q.P Value		AVG. Value			Q.P Value		AVG. Value		Q.P Value	AVG. Value	Q.P. or AVG.
	L1	L2	L1	L2		L1	L2	L1	L2			
0.341	41.0	40.4	----	----	0.2	41.2	40.6	----	----	59.2	49.2	-18.0
0.412	47.3	46.5	----	----	0.2	47.5	46.7	----	----	57.6	47.6	-10.1
0.478	46.4	46.0	----	----	0.2	46.6	46.2	----	----	56.4	46.4	-9.8
0.754	40.8	39.4	----	----	0.2	41.0	39.6	----	----	56.0	46.0	-15.0
0.820	***	39.5	----	----	0.2	***	39.7	----	----	56.0	46.0	-16.3
0.891	***	38.1	----	----	0.2	***	38.3	----	----	56.0	46.0	-17.7
1.914	41.1	***	----	----	0.2	41.3	***	----	----	56.0	46.0	-14.7
2.121	40.3	***	----	----	0.2	40.5	***	----	----	56.0	46.0	-15.5

Note:

1. "***" means the value was too low to be measured.
2. 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.
3. "#" means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is ±2.5dB.
5. Please refer to page 25 to page 26 for chart.

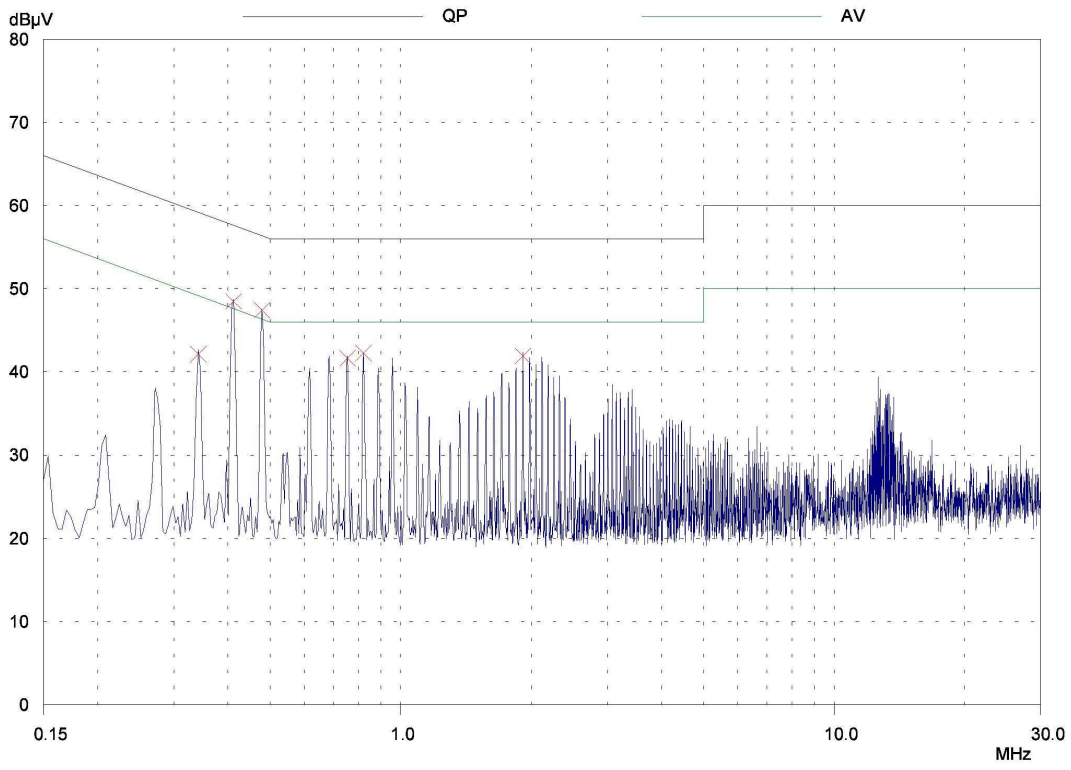
CONDUCTED EMISSION TEST

PEAK VALUE

EUT:
Manuf:
Op Cond: TX CH39
Operator: JAMES
Test Spec: FCC
Comment: L1

Result File: ce_l1.dat :

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 6 dB



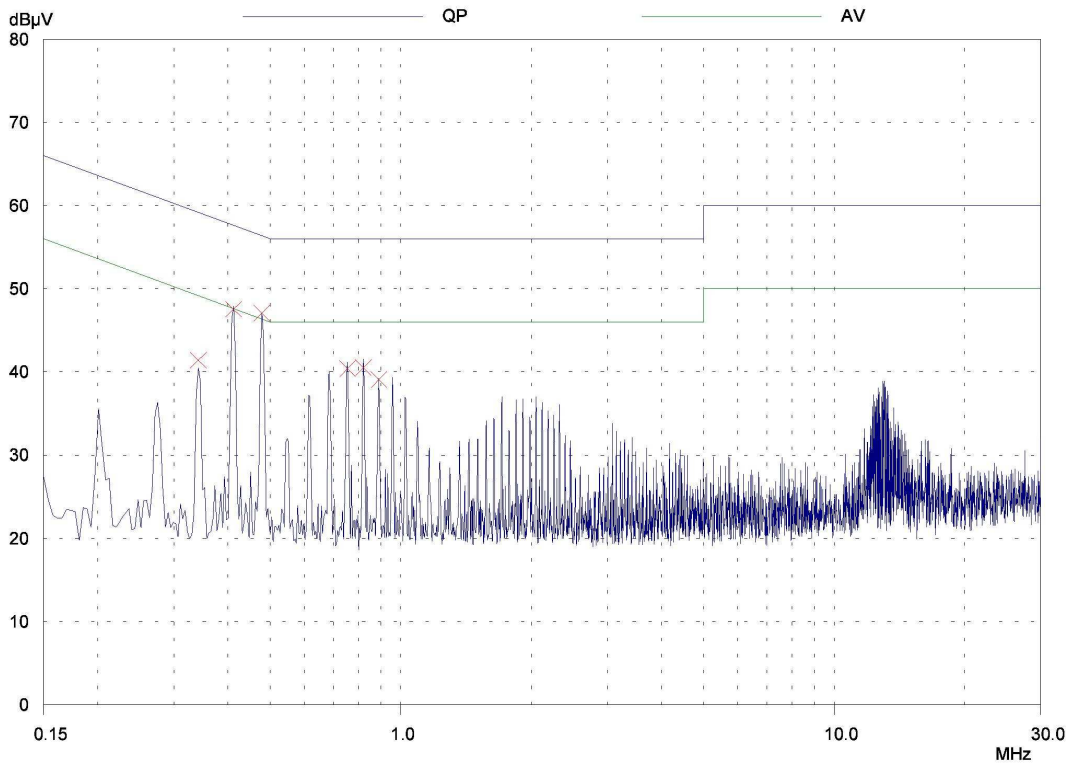
CONDUCTED EMISSION TEST

PEAK VALUE

EUT:
Manuf:
Op Cond: TX CH39
Operator: JAMES
Test Spec: FCC
Comment: L2

Result File: ce_l2.dat :

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 6 dB



5.3.3

Operation Mode: 2480 MHz

Test Date : Jun. 23, 2005 Temperature : 23℃ Humidity : 56%

Freq. (MHz)	**Meter Reading** (dBuV)				**Factor** (dB)	**Result** (dBuV)				**Limit** (dBuV)		**Margins** (dB)
	Q.P Value		AVG. Value			Q.P Value		AVG. Value		Q.P Value	AVG. Value	Q.P. or AVG.
	L1	L2	L1	L2		L1	L2	L1	L2			
0.209	***	34.7	----	----	0.2	***	34.9	----	----	63.2	53.2	-28.3
0.275	36.7	***	----	----	0.2	36.9	***	----	----	61.0	51.0	-24.1
0.341	40.6	40.4	----	----	0.2	40.8	40.6	----	----	59.2	49.2	-18.4
0.408	45.8	***	----	----	0.2	46.0	***	----	----	57.7	47.7	-11.7
0.412	***	46.5	----	----	0.2	***	46.7	----	----	57.6	47.6	-10.9
0.478	46.0	46.0	----	----	0.2	46.2	46.2	----	----	56.4	46.4	-10.2
0.684	***	39.2	----	----	0.2	***	39.4	----	----	56.0	46.0	-16.6
0.754	39.3	***	----	----	0.2	39.5	***	----	----	56.0	46.0	-16.5
0.820	***	39.5	----	----	0.2	***	39.7	----	----	56.0	46.0	-16.3
2.051	35.9	***	----	----	0.2	36.1	***	----	----	56.0	46.0	-19.9

Note:

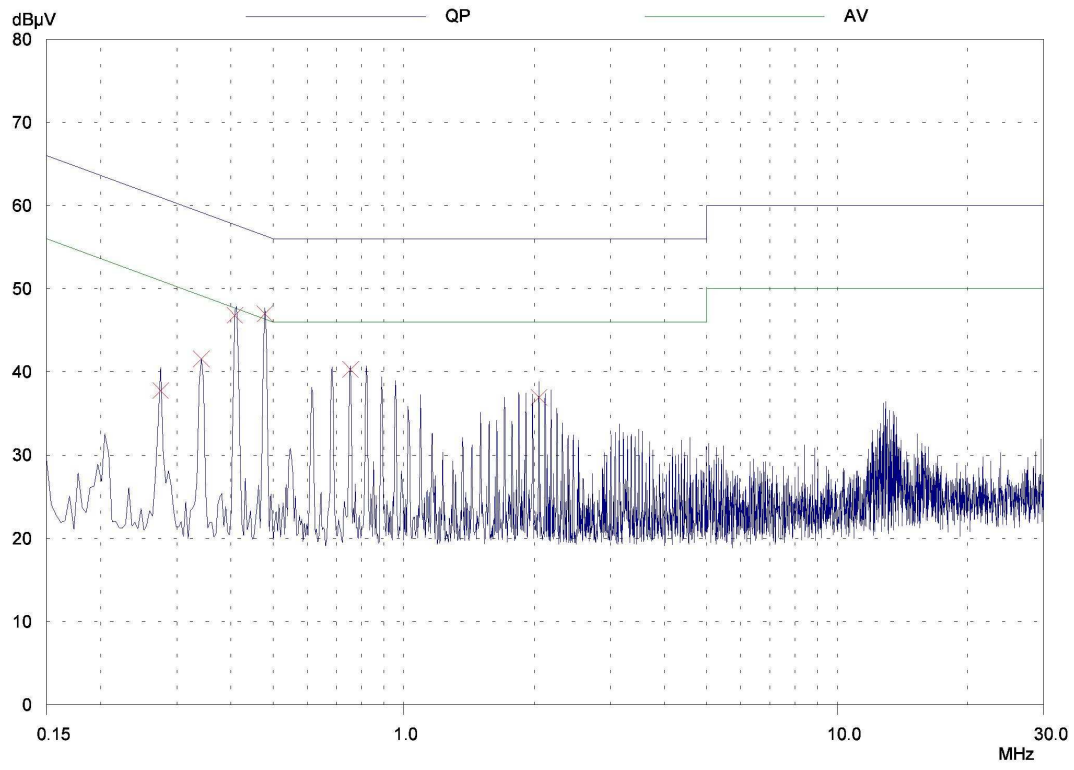
1. "***" means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. "#" means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is ±2.5dB.
5. Please refer to page 28 to page 29 for chart.

CONDUCTED EMISSION TEST

PEAK VALUE

EUT:	Bluetooth Headset
Manuf:	
Op Cond:	TX CH78
Operator:	JAMES
Test Spec:	FCC
Comment:	L1
Result File:	ce_l1.dat :

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	6 dB

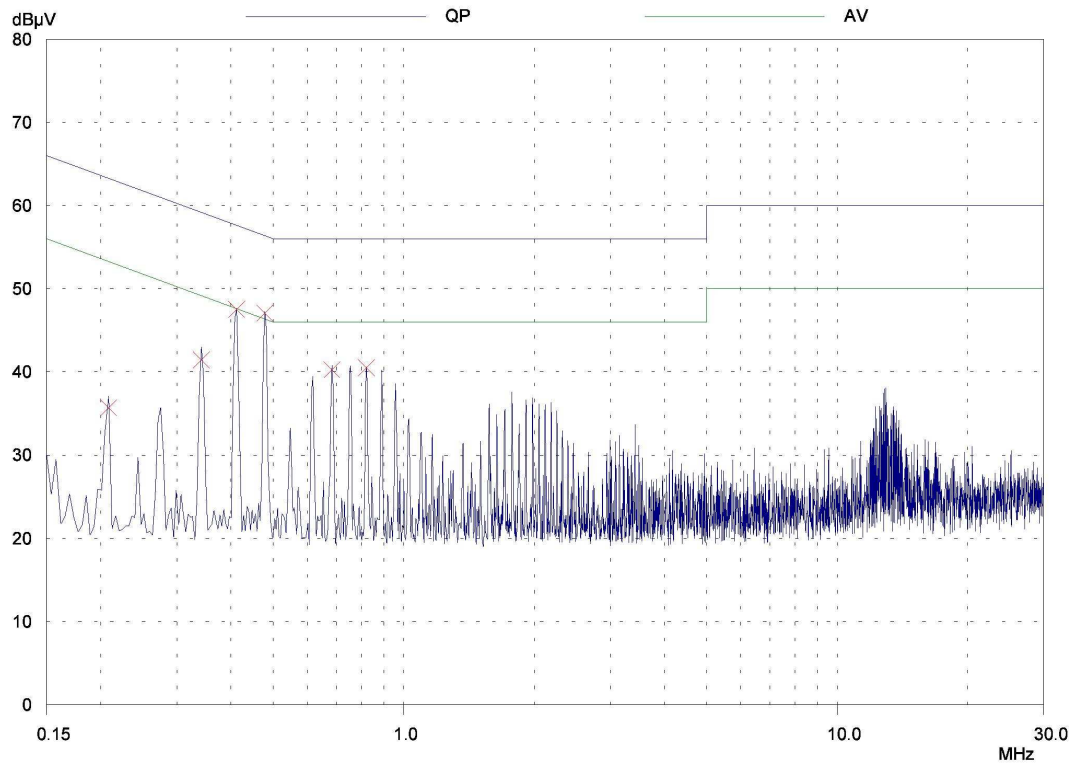


CONDUCTED EMISSION TEST

PEAK VALUE

EUT:	Bluetooth Headset
Manuf:	
Op Cond:	TX CH78
Operator:	JAMES
Test Spec:	FCC
Comment:	L2
Result File:	ce_l2.dat :

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	6 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:

RESULT = READING + LISN FACTOR (Included Cable Loss)

Assume a receiver reading of 22.5 dB μ V is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dB μ V.

RESULT = 22.5 + 0.1 = 22.6 dB μ V

Level in μ V = Common Antilogarithm[(22.6 dB μ V)/20]

= 13.48 μ V

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	03/31/2006
Line Impedance Stabilization network	EMCO	3825	11/09/2005
Line Impedance Stabilization network	Rolf Heine	NNB-2/16Z	03/31/2006

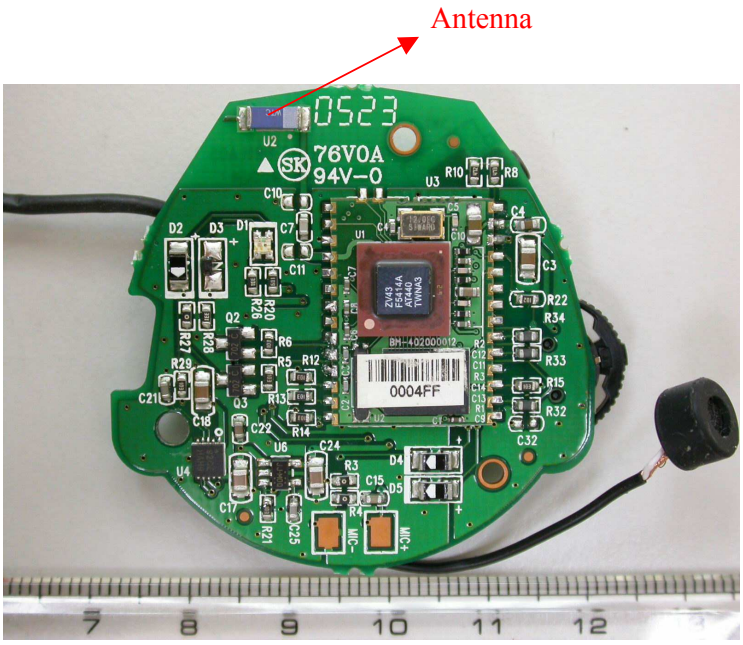
6 ANTENNA REQUIREMENT

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 Receving 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

Highly efficient multilayer ceramic antennas fix on the PCB. The peak gain of antenna used is 2.0 dBi.



7 20dB EMISSION BANDWIDTH MEASUREMENT

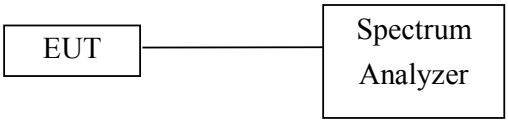
7.1 Standard Applicable

According to 15.247(a)(1), for frequency hopping systems, hopping channel carrier frequencies seperated 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

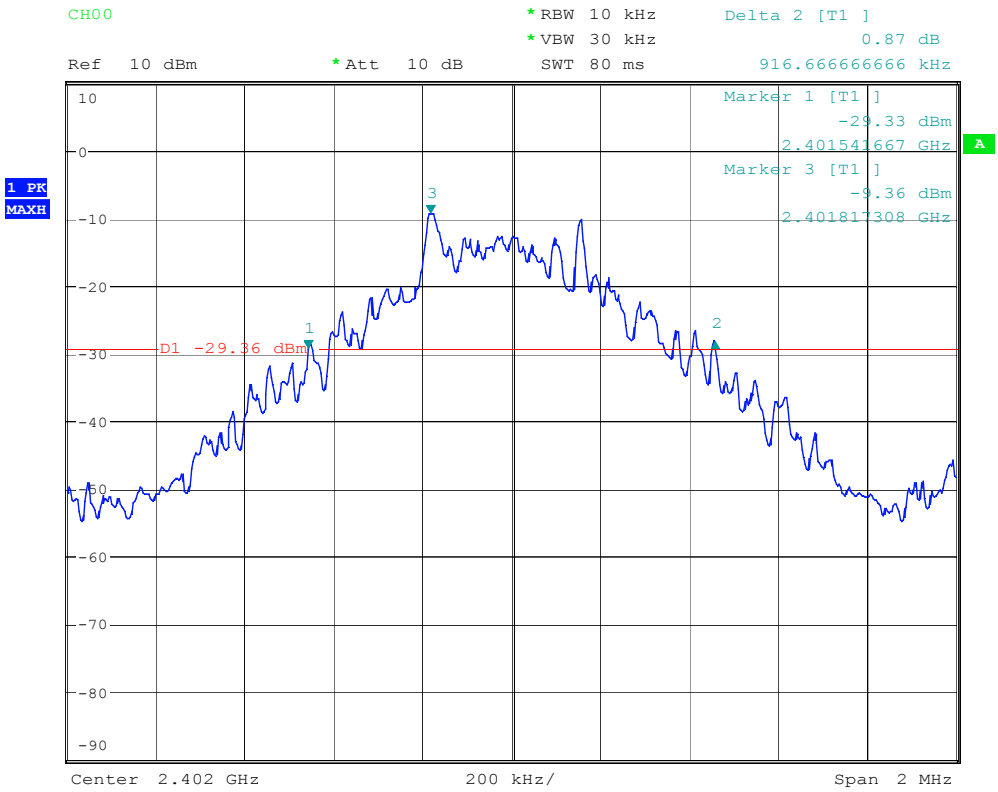
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

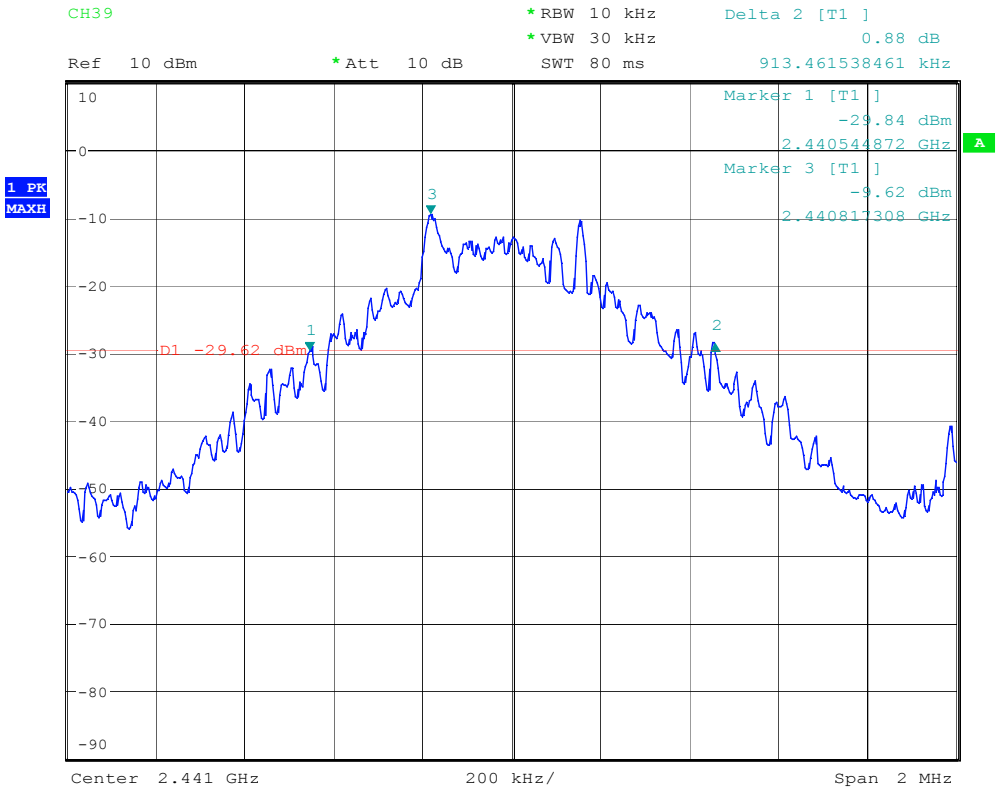
7.4 Measurement Data

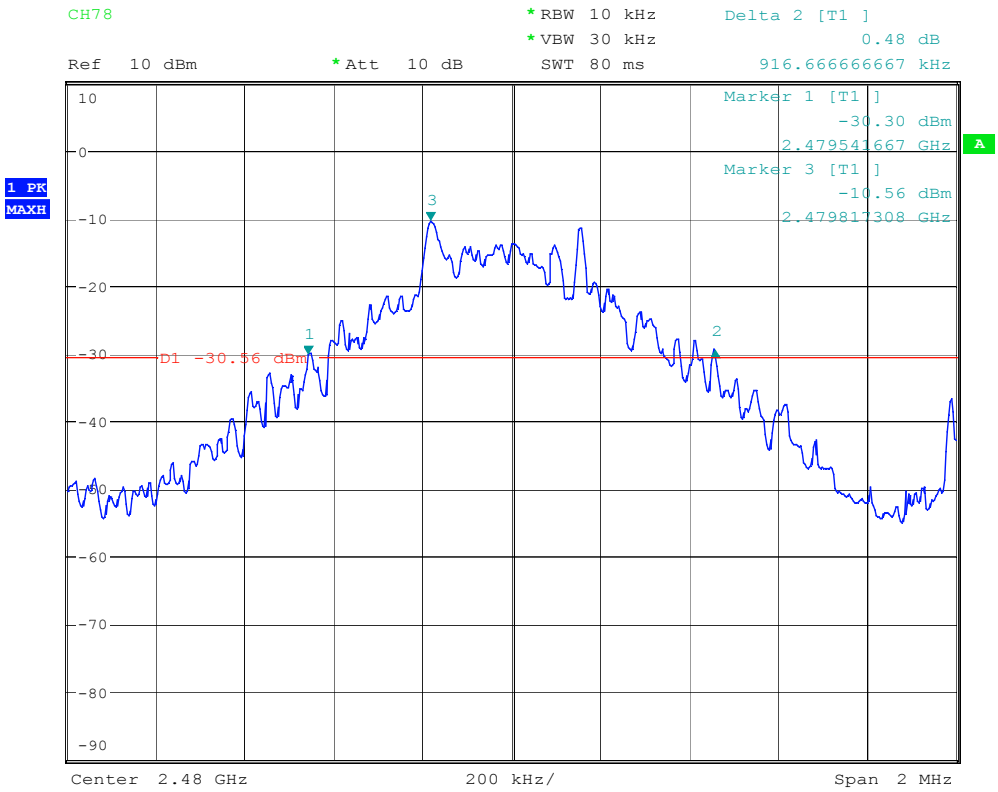
Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Chart
0	2402	0.917	Page 34
39	2441	0.913	Page 35
78	2480	0.917	Page 36

Note: Please refer to page 34 to page 36 for chart.


CH00
*RBW 10 kHz
*VBW 30 kHz
Ref 10 dBm
*Att 10 dB
SWT 80 ms
Delta 2 [T1]
0.87 dB
916.666666666 kHz
Marker 1 [T1]
-29.33 dBm
2.401541667 GHz
Marker 3 [T1]
-9.36 dBm
2.401817308 GHz
1 PK
MAXH
A
D1 -29.36 dBm
Center 2.402 GHz
200 kHz/
Span 2 MHz


CH39
* RBW 10 kHz
* VBW 30 kHz
Ref 10 dBm
* Att 10 dB
SWT 80 ms
Delta 2 [T1]
0.88 dB
913.461538461 kHz
Marker 1 [T1]
-29.84 dBm
2.440544872 GHz
Marker 3 [T1]
-9.62 dBm
2.440817308 GHz
1 PK
MAXH
A
D1 -29.62 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
200 kHz/
Span 2 MHz


CH78
*RBW 10 kHz
*VBW 30 kHz
Ref 10 dBm
*Att 10 dB
SWT 80 ms
Delta 2 [T1]
0.48 dB
916.666666667 kHz
Marker 1 [T1]
-30.30 dBm
2.479541667 GHz
Marker 3 [T1]
-10.56 dBm
2.479817308 GHz
1 PK
MAXH
A
D1 -30.56 dBm
Center 2.48 GHz
200 kHz/
Span 2 MHz

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 Receving 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 1 MHz and VBW to 3 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

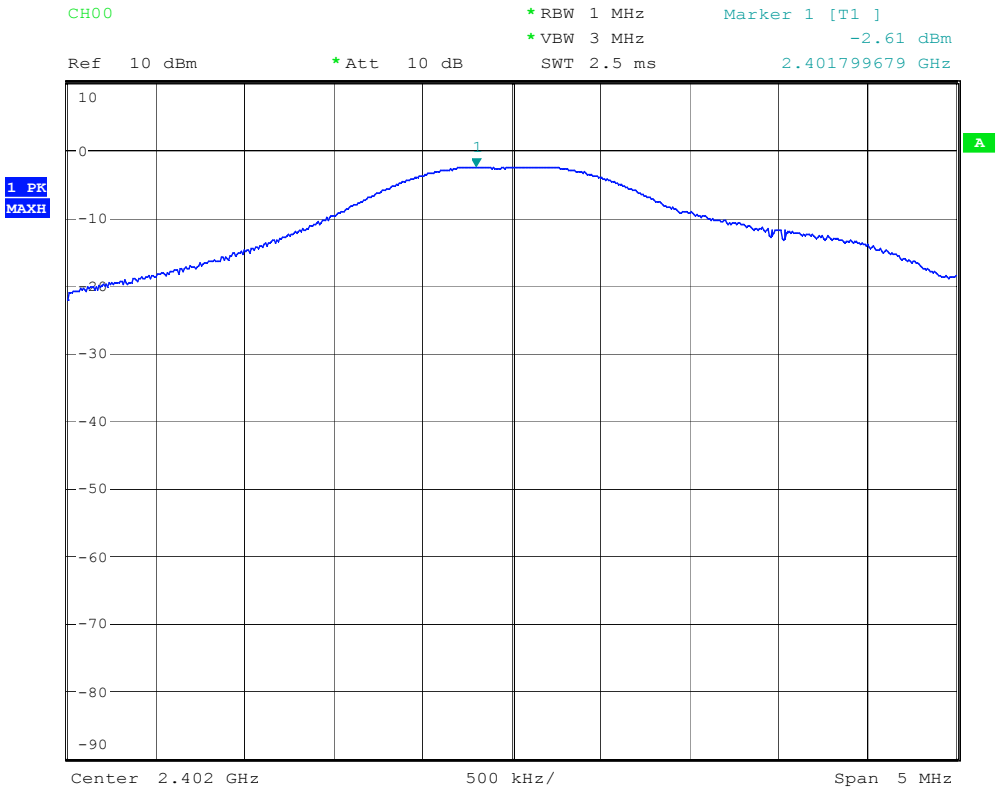
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

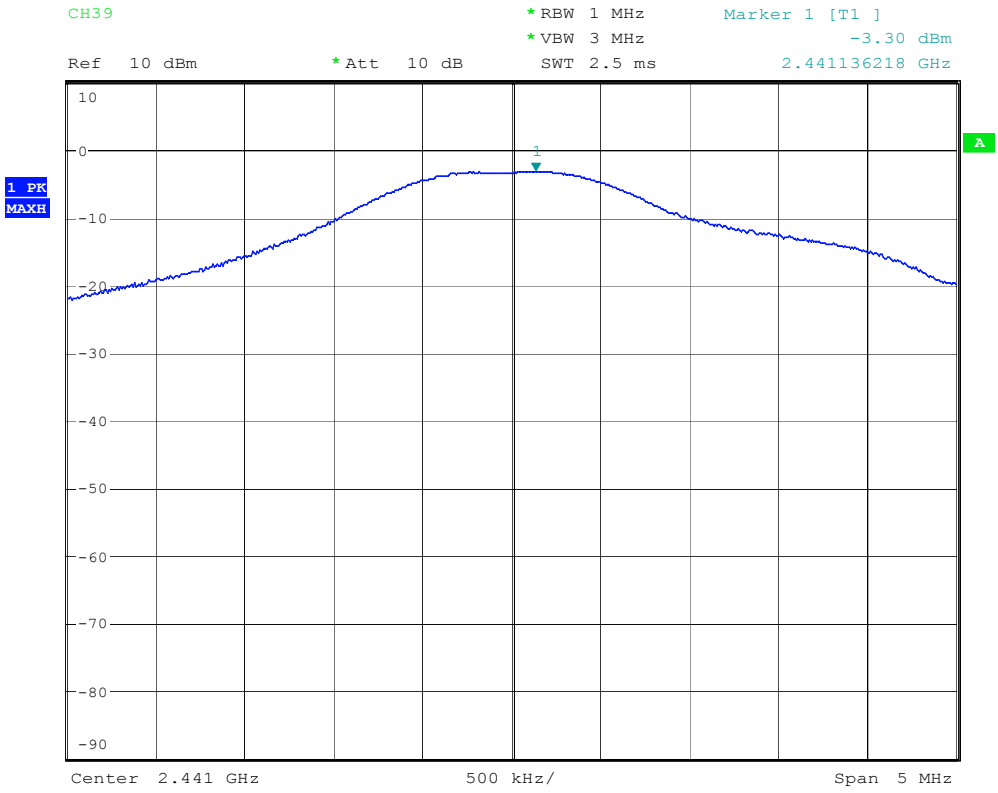
8.4 Measurement Data

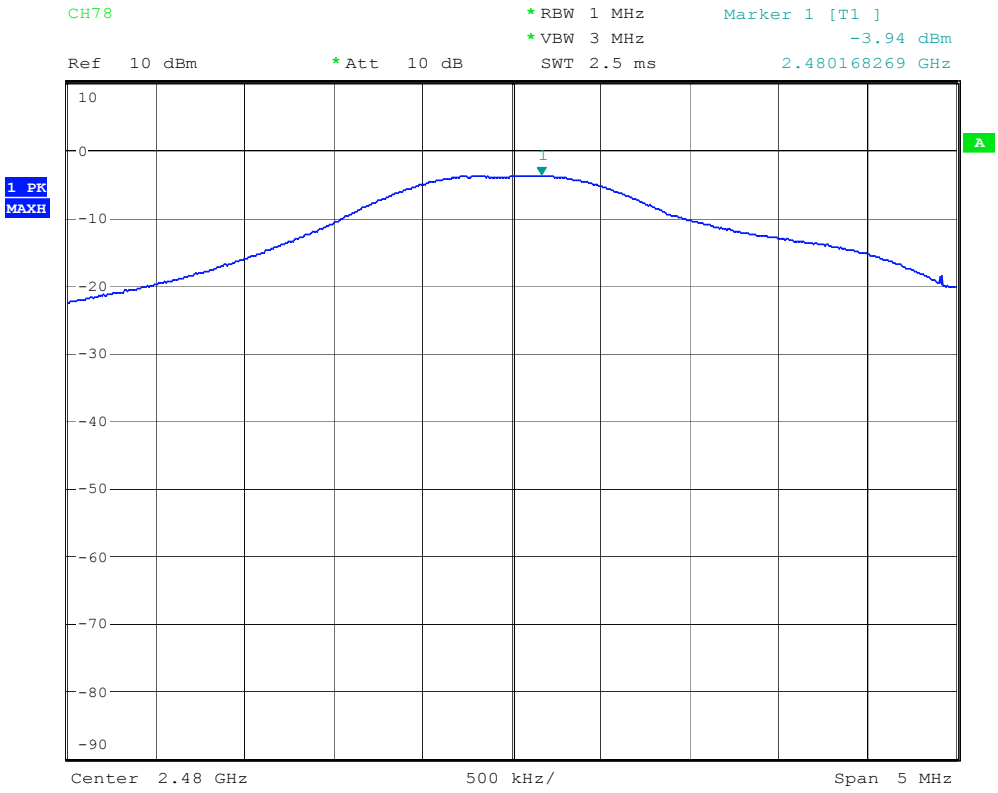
Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

Channel	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
0	2402	-2.61	0.5	-2.11	0.615	1000	Page 39
39	2441	-3.30	0.5	-2.80	0.525	1000	Page 40
78	2480	-3.94	0.5	-2.44	0.570	1000	Page 41

Note: Please refer to page 39 to page 41 for chart.


CH00
*RBW 1 MHz
*VBW 3 MHz
Marker 1 [T1]
-2.61 dBm
Ref 10 dBm
*Att 10 dB
SWT 2.5 ms
2.401799679 GHz
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
500 kHz/
Span 5 MHz


CH39
*RBW 1 MHz
*VBW 3 MHz
Marker 1 [T1]
-3.30 dBm
Ref 10 dBm
*Att 10 dB
SWT 2.5 ms
2.441136218 GHz
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
500 kHz/
Span 5 MHz


CH78
*RBW 1 MHz
*VBW 3 MHz
Marker 1 [T1]
-3.94 dBm
2.480168269 GHz
Ref 10 dBm
*Att 10 dB
SWT 2.5 ms
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
500 kHz/
Span 5 MHz

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

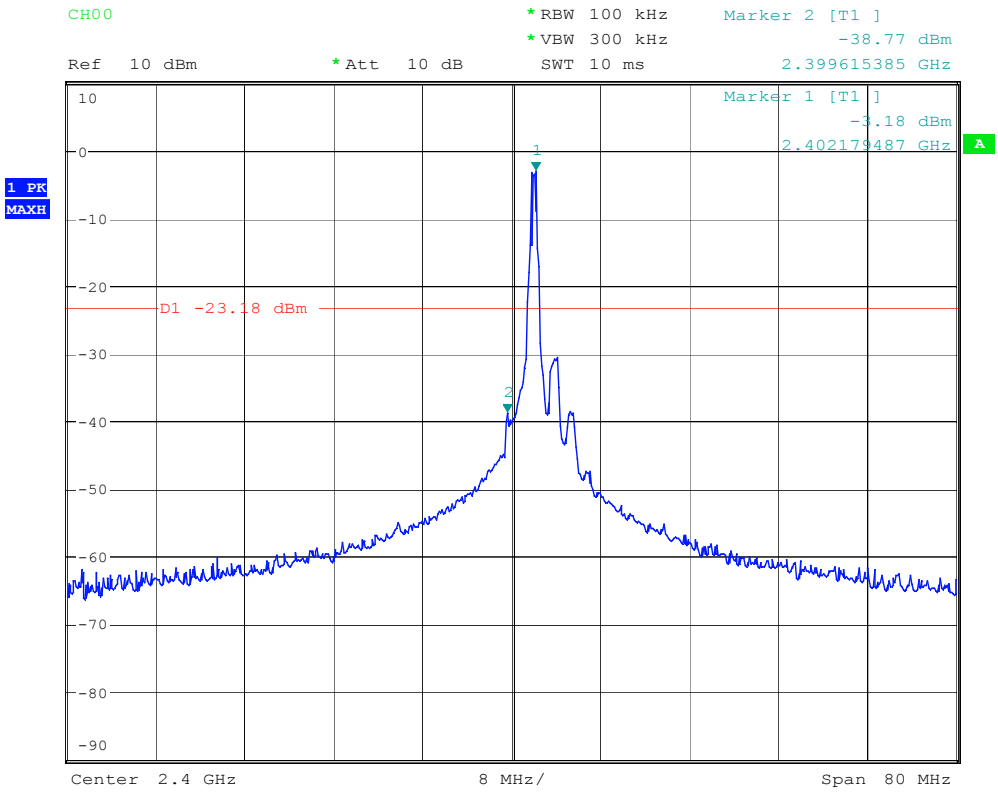
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

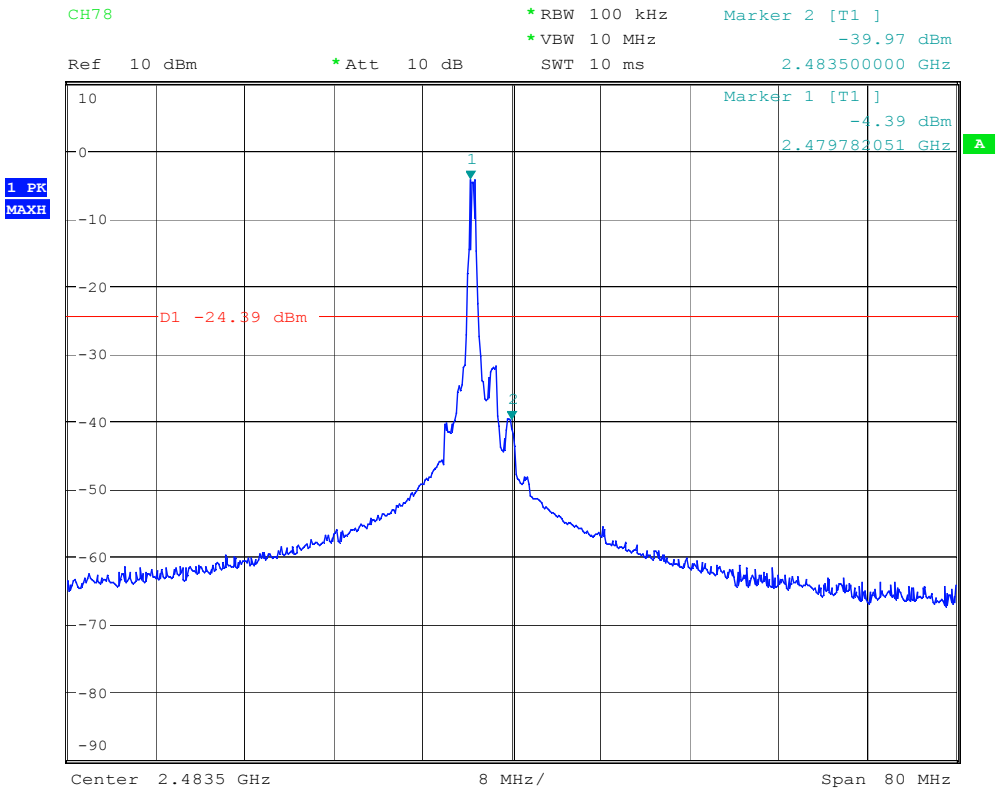
9.4 Measurement Data

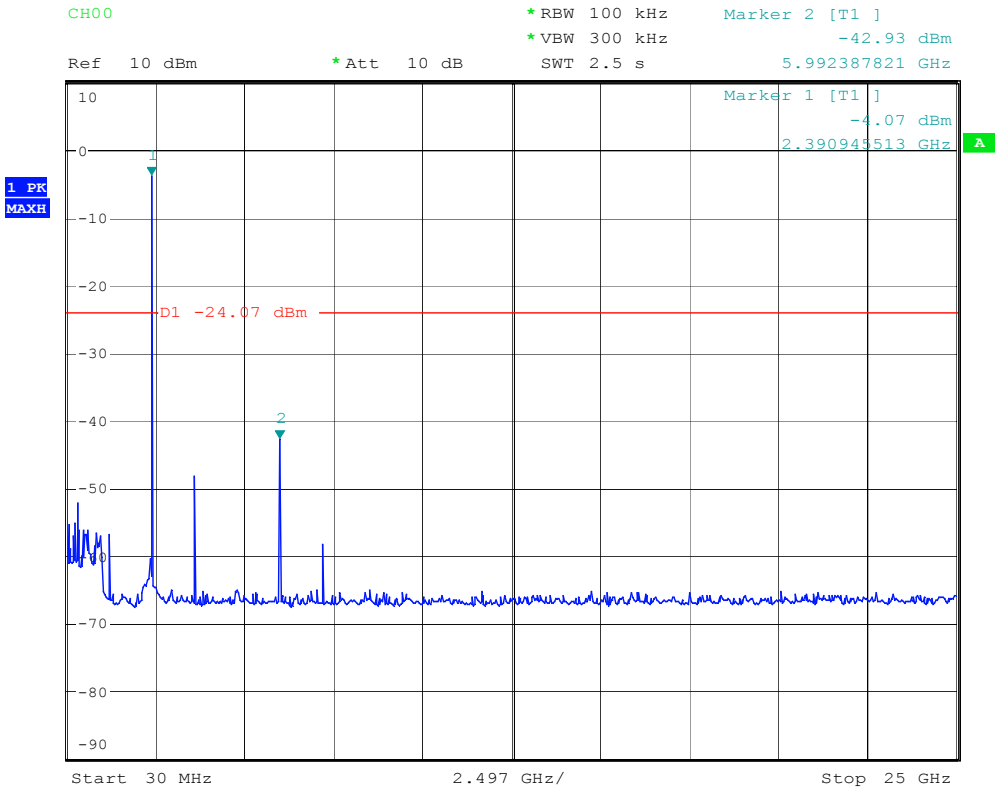
Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

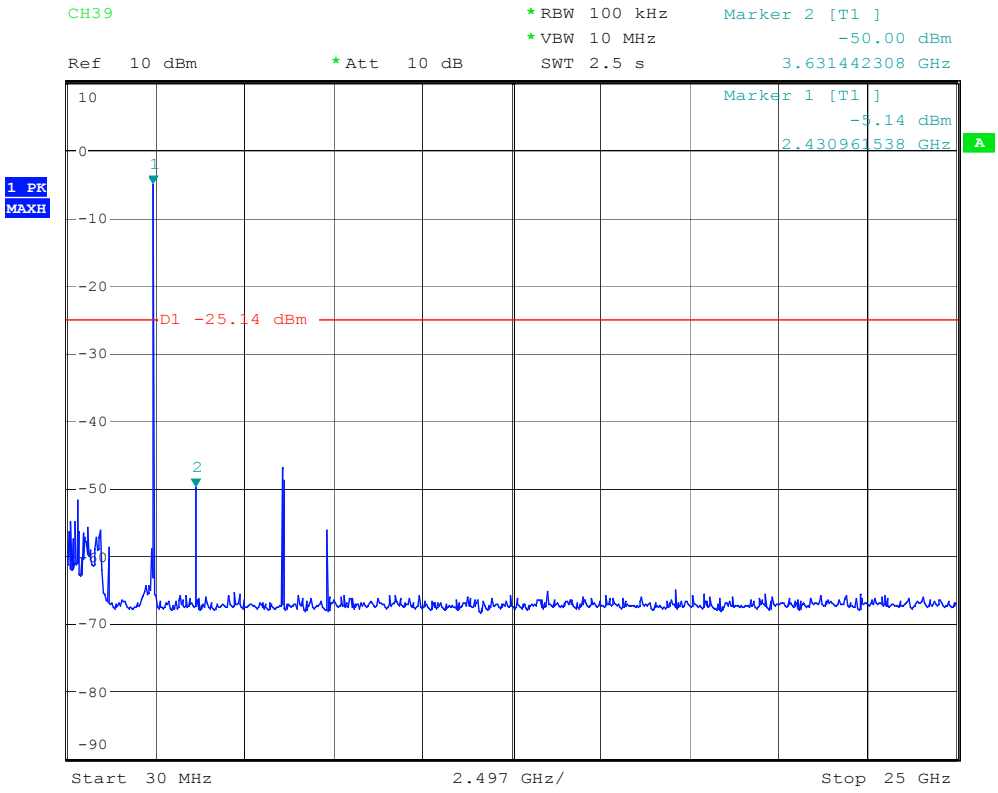
Channel	Test Frequency Range	Note	Chart
0	2360 MHz - 2440 MHz	Lower Band Edge	Page 44
78	2443.5 MHz - 2523.5 MHz	Upper Band Edge	Page 45
0	30 MHz - 25 GHz		Page 46
39	30 MHz - 25 GHz		Page 47
78	30 MHz - 25 GHz		Page 48

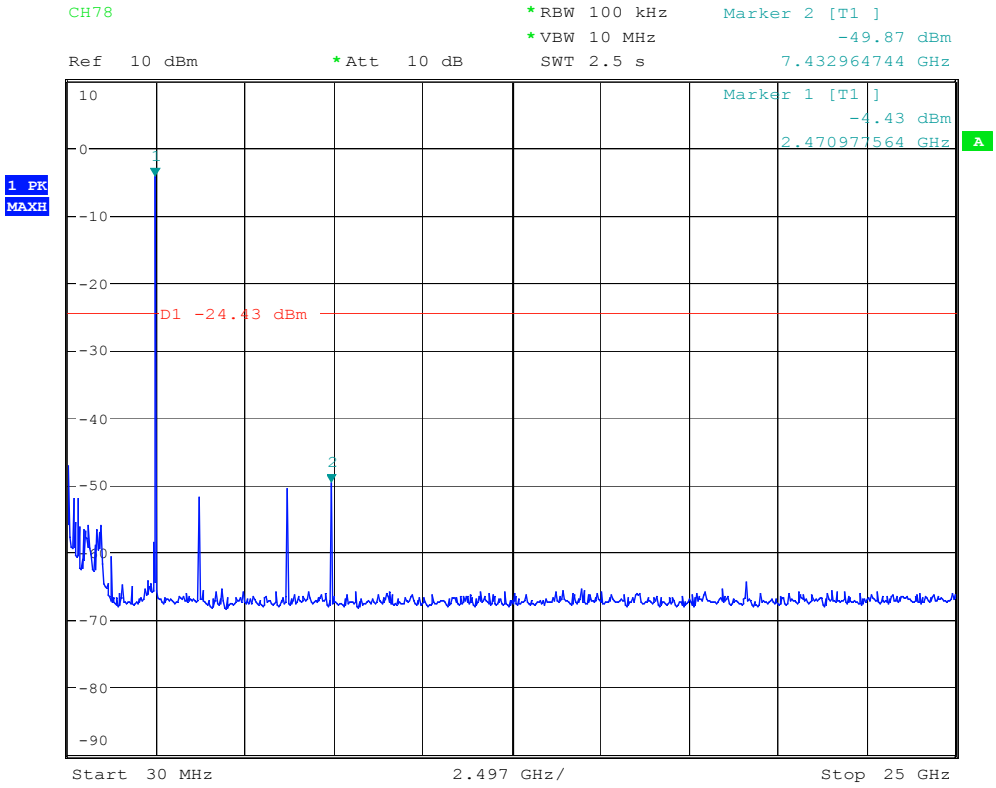
Note: Please refer to page 44 to page 48 for chart.


CH00
*RBW 100 kHz
*VBW 300 kHz
Marker 2 [T1]
-38.77 dBm
2.399615385 GHz
Ref 10 dBm
*Att 10 dB
SWT 10 ms
Marker 1 [T1]
-3.18 dBm
2.402179487 GHz
A
1 PK
MAXH
D1 -23.18 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.4 GHz
8 MHz/
Span 80 MHz


CH78
*RBW 100 kHz
*VBW 10 MHz
Marker 2 [T1]
-39.97 dBm
2.483500000 GHz
Ref 10 dBm
*Att 10 dB
SWT 10 ms
Marker 1 [T1]
-4.39 dBm
2.479782051 GHz
A
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
D1 -24.39 dBm
Center 2.4835 GHz
8 MHz/
Span 80 MHz


CH00
*RBW 100 kHz
*VBW 300 kHz
Ref 10 dBm
*Att 10 dB
SWT 2.5 s
Marker 2 [T1]
-42.93 dBm
5.992387821 GHz
Marker 1 [T1]
-4.07 dBm
2.390945513 GHz
A
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
D1 -24.07 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


CH39
*RBW 100 kHz
*VBW 10 MHz
Ref 10 dBm
*Att 10 dB
SWT 2.5 s
Marker 2 [T1]
-50.00 dBm
3.631442308 GHz
Marker 1 [T1]
-5.14 dBm
2.430961538 GHz
A
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
D1 -25.14 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


CH78
*RBW 100 kHz
*VBW 10 MHz
Ref 10 dBm
*Att 10 dB
SWT 2.5 s
Marker 2 [T1]
-49.87 dBm
7.432964744 GHz
Marker 1 [T1]
-4.43 dBm
2.470977564 GHz
A
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
D1 -24.43 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

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 miximum to measure the number of hopping channels.

10.3 Measurement Equipment

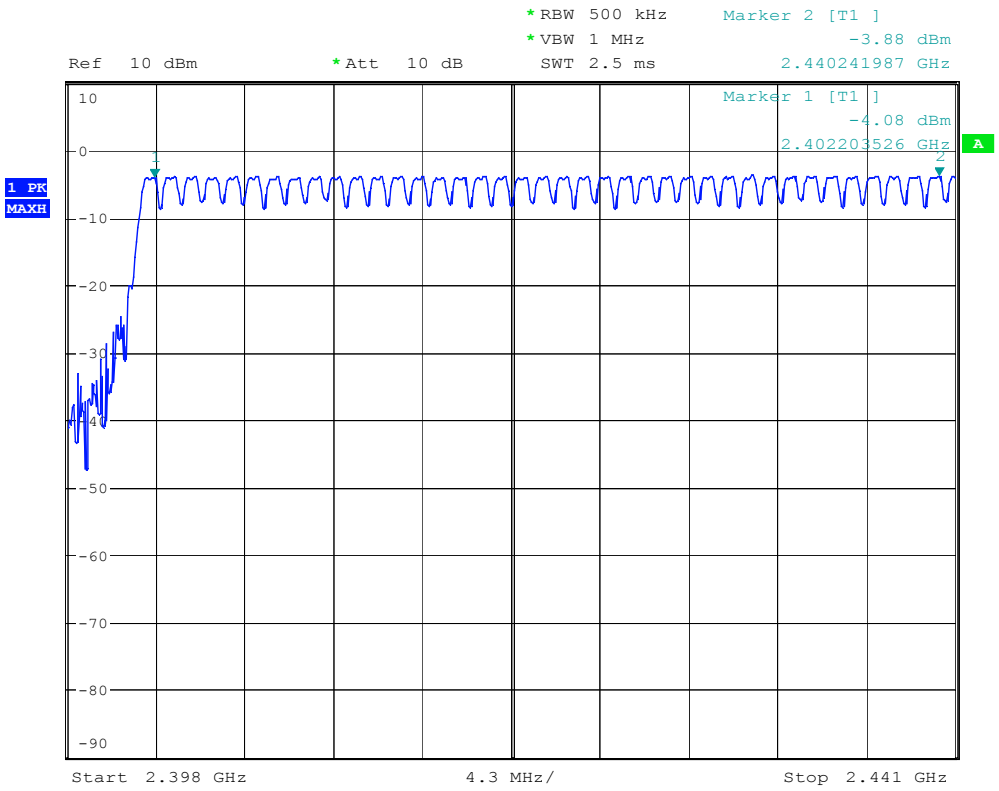
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

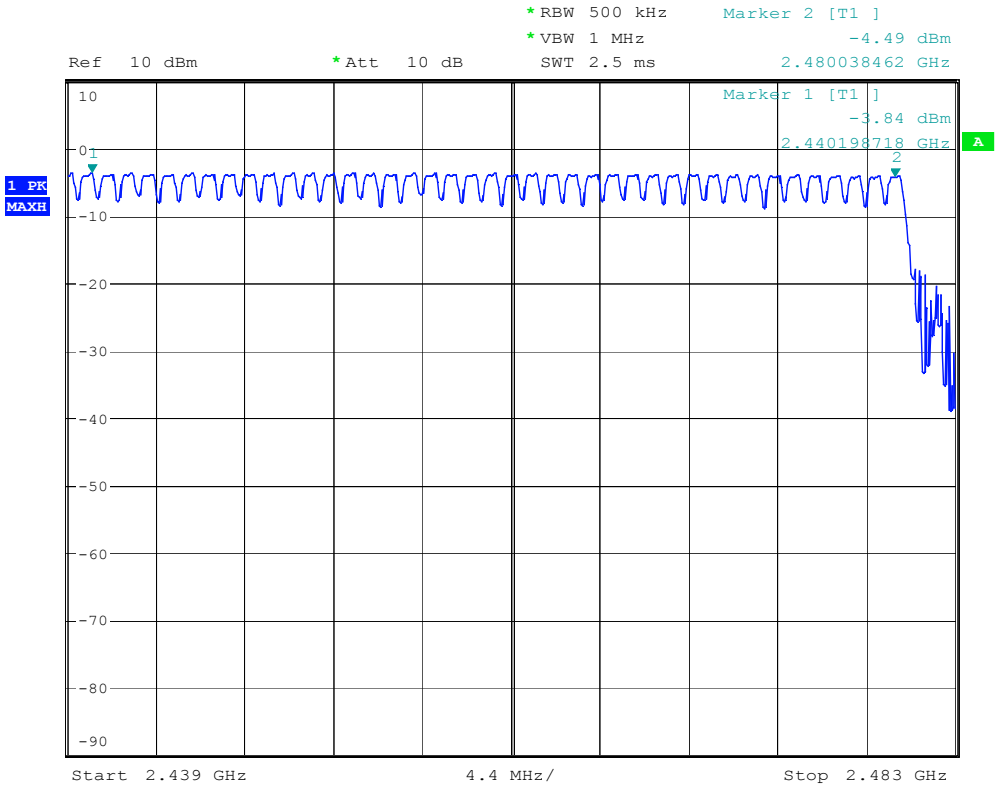
10.4 Measurement Data

Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

Number of hopping channels = 79 channels

Note: Please refer to page 50 for chart





1.0

Date: 21.JUN.2005 13:38:51

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 seperated 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 ragne 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

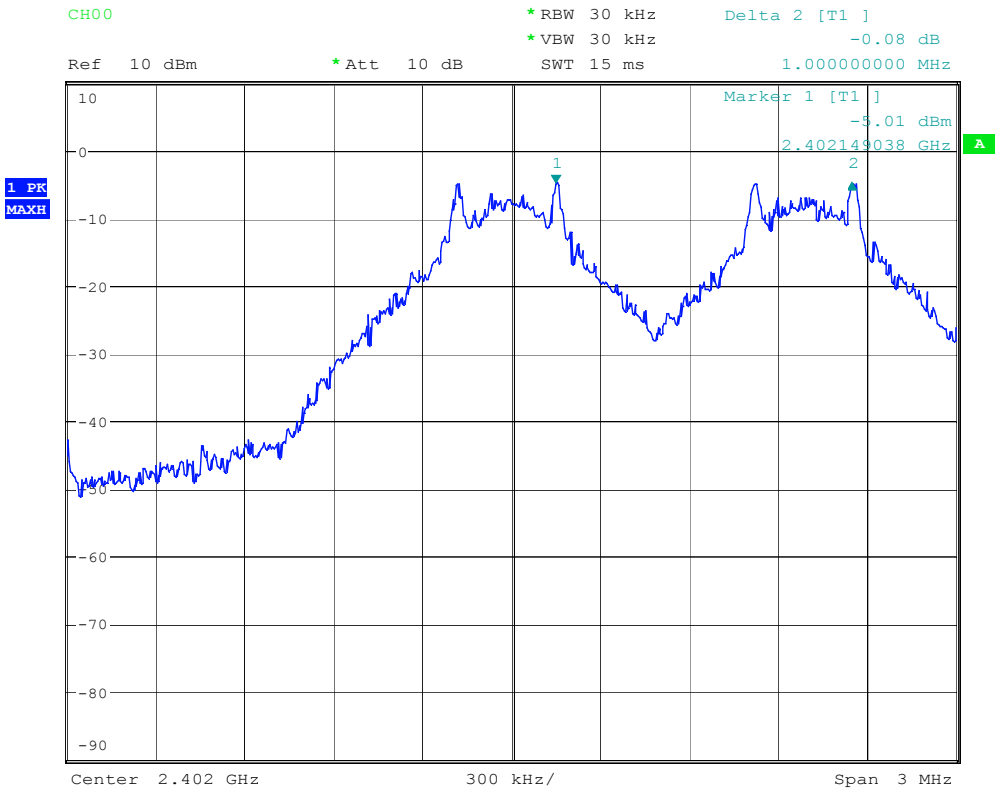
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

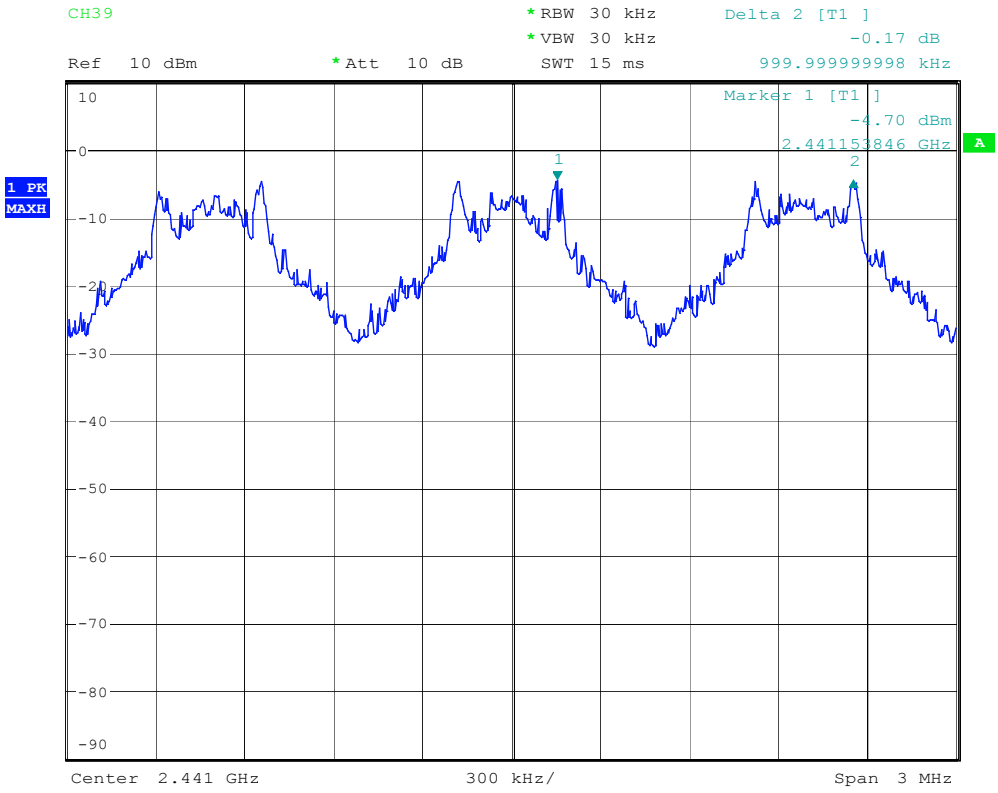
11.4 Measurement Data

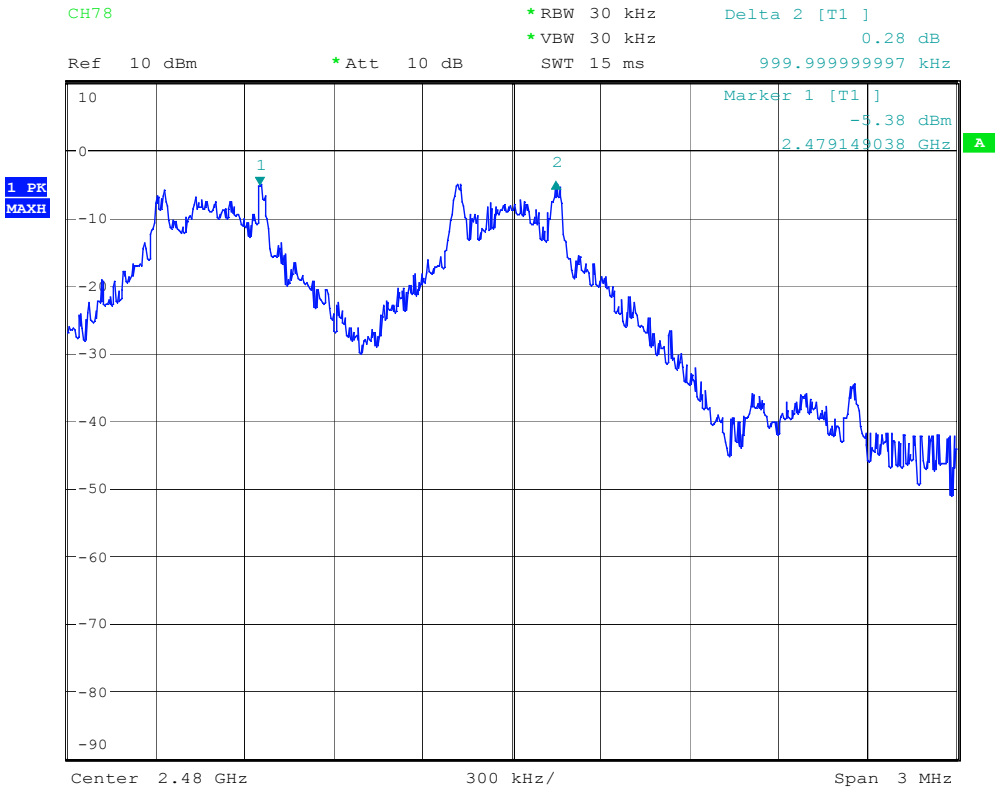
Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

Channel	Frequency (MHz)	Hopping Channel Carrier Frequency Separated (MHz)	Chart
0	2402	1	Page 53
39	2441	1	Page 54
78	2480	1	Page 55

Note: Please refer to page 53 to page 55 for chart.


CH00
*RBW 30 kHz
*VBW 30 kHz
Delta 2 [T1]
-0.08 dB
1.000000000 MHz
Ref 10 dBm
*Att 10 dB
SWT 15 ms
Marker 1 [T1]
-3.01 dBm
2.402149038 GHz
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
300 kHz/
Span 3 MHz


CH39
*RBW 30 kHz
*VBW 30 kHz
Delta 2 [T1]
-0.17 dB
Ref 10 dBm
*Att 10 dB
SWT 15 ms
999.999999998 kHz
Marker 1 [T1]
-4.70 dBm
2.441153846 GHz
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
300 kHz/
Span 3 MHz


CH78
*RBW 30 kHz
*VBW 30 kHz
Ref 10 dBm
*Att 10 dB
SWT 15 ms
Delta 2 [T1]
0.28 dB
999.999999997 kHz
Marker 1 [T1]
-5.38 dBm
2.479149038 GHz
A
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
300 kHz/
Span 3 MHz

12 POWER SPECTRAL DENSITY

12.1 Standard Applicable

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 them 8dBm in any 3kHz band during any time interral of continuous transmission.

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. 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 3kHz, VBW to 30 kHz, sweep 300kHz and sweep time 100 sec.
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.

12.3 Measurement Equipment

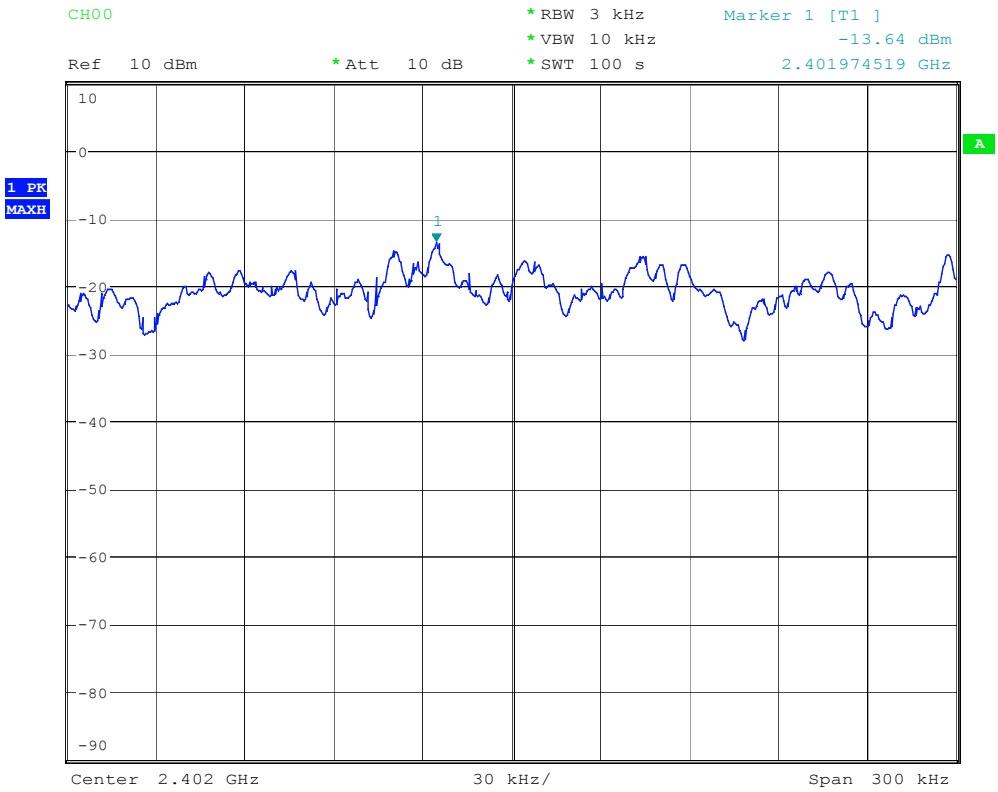
Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

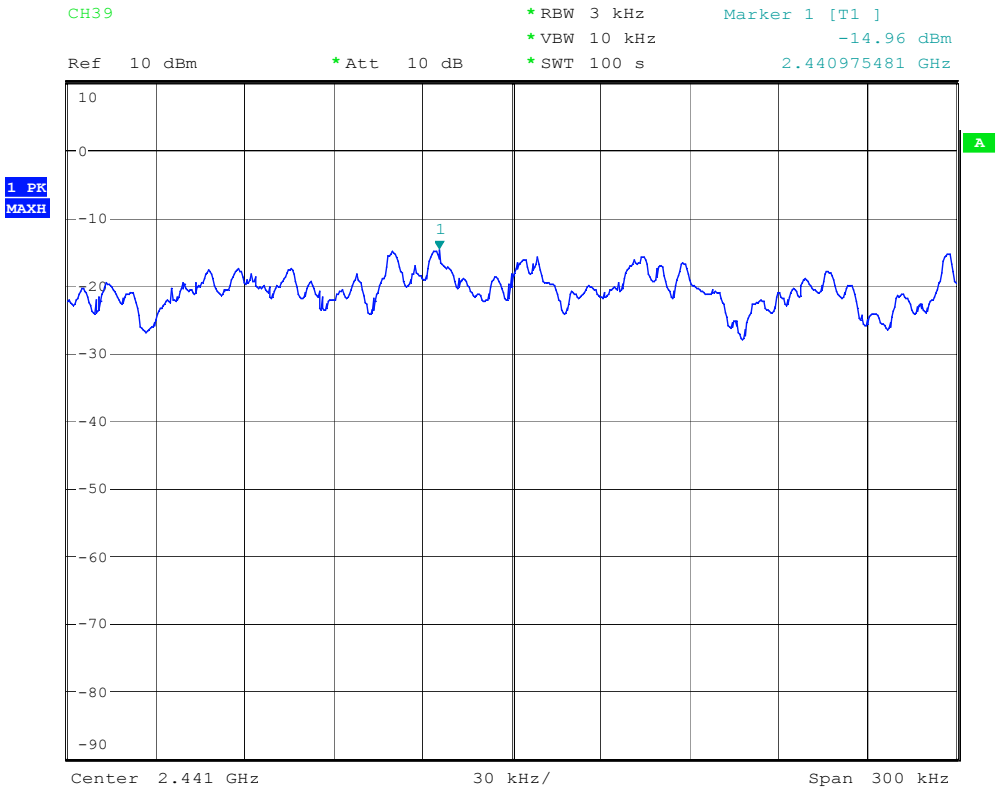
12.4 Measurement Data

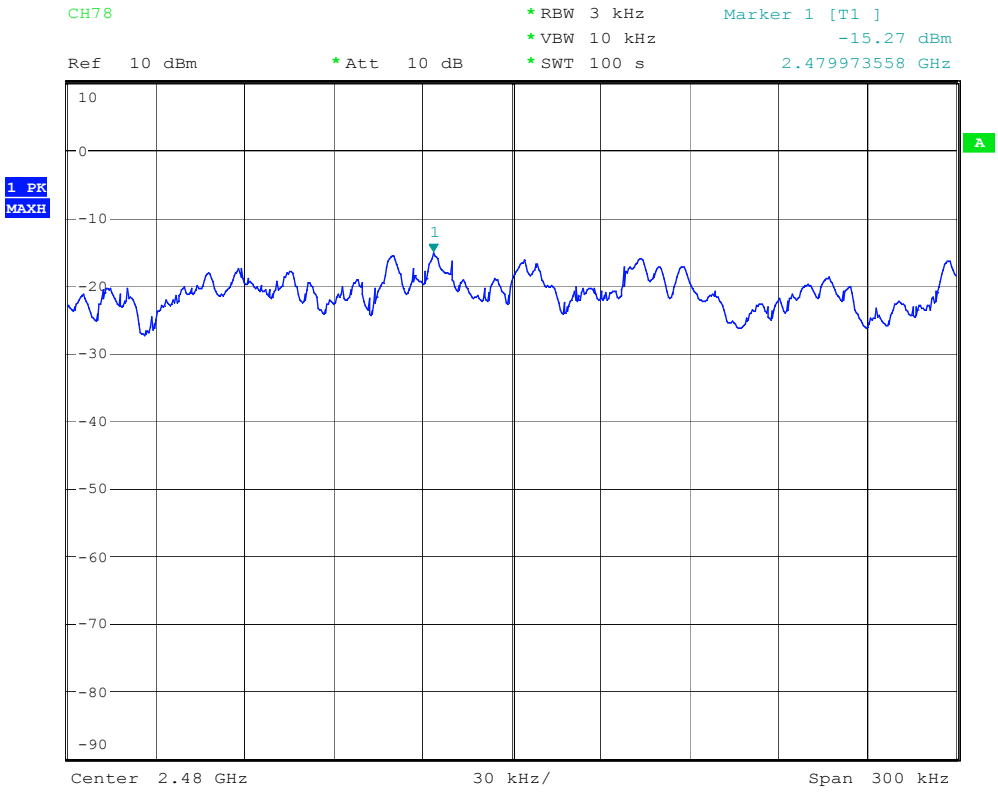
Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

Channel	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
0	2402	-13.64	0.5	-13.14	8	Page 58
39	2441	-14.96	0.5	-14.46	8	Page 59
78	2480	-15.27	0.5	-14.77	8	Page 60

Note: Please refer to page 58 to page 60 for chart.


CH00
*RBW 3 kHz
*VBW 10 kHz
*SWT 100 s
Marker 1 [T1]
-13.64 dBm
2.401974519 GHz
Ref 10 dBm
*Att 10 dB
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
30 kHz/
Span 300 kHz


CH39
*RBW 3 kHz
*VBW 10 kHz
*SWT 100 s
Marker 1 [T1]
-14.96 dBm
2.440975481 GHz
Ref 10 dBm
*Att 10 dB
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.441 GHz
30 kHz/
Span 300 kHz


CH78
*RBW 3 kHz
*VBW 10 kHz
*SWT 100 s
Marker 1 [T1]
-15.27 dBm
2.479973558 GHz
Ref 10 dBm
*Att 10 dB
1 PK
MAXH
A
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
30 kHz/
Span 300 kHz

13 Dwell Time

13.1 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.

13.2 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.

13.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSU46	10/03/2005

13.4 Measurement Data

Test Date : Jun. 21, 2005 Temperature : 24 ℃ Humidity: 54%

13.4.1 DH1

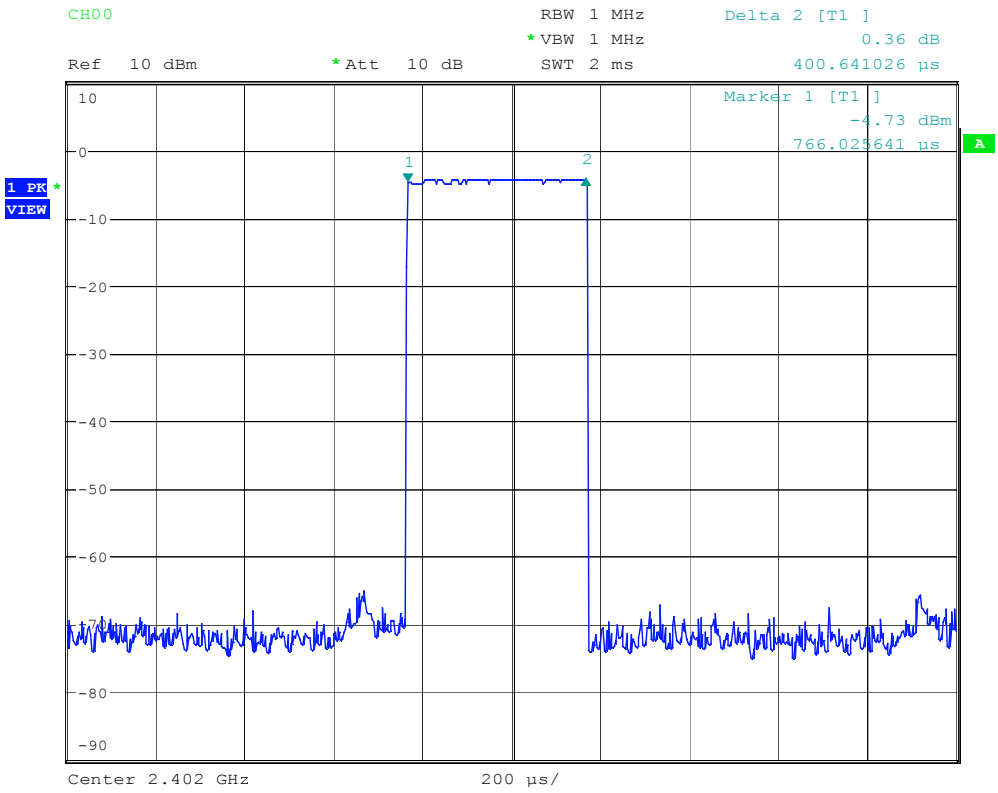
Test period=0.4(second/channel)× 79 channel=31.6sec

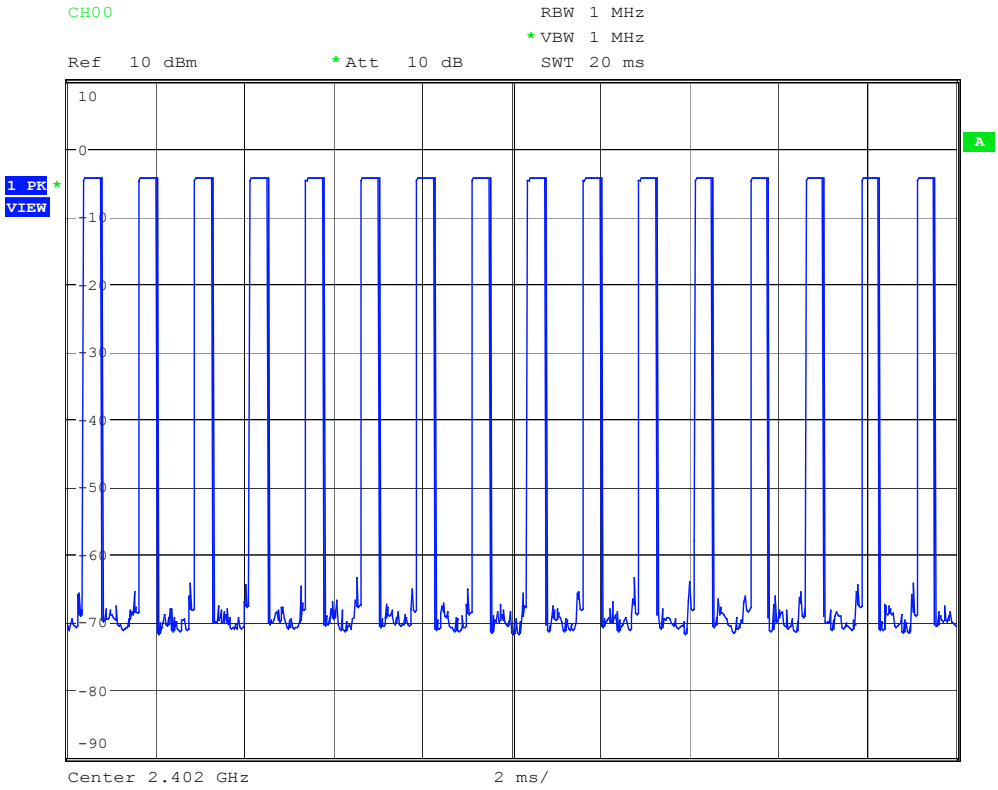
a) 2402MHz dwell time= 400.641 us× $\frac{800}{79}$ ×31.6 = 128.205 ms

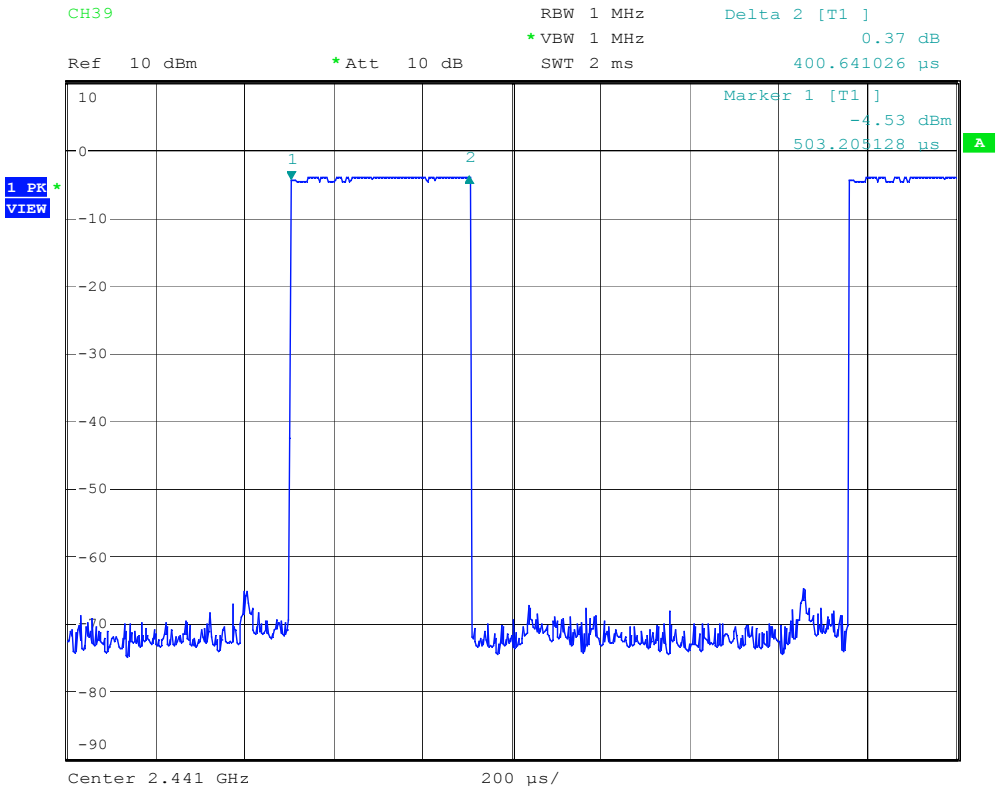
b) 2441MHz dwell time= 400.641 us× $\frac{800}{79}$ ×31.6 = 128.205 ms

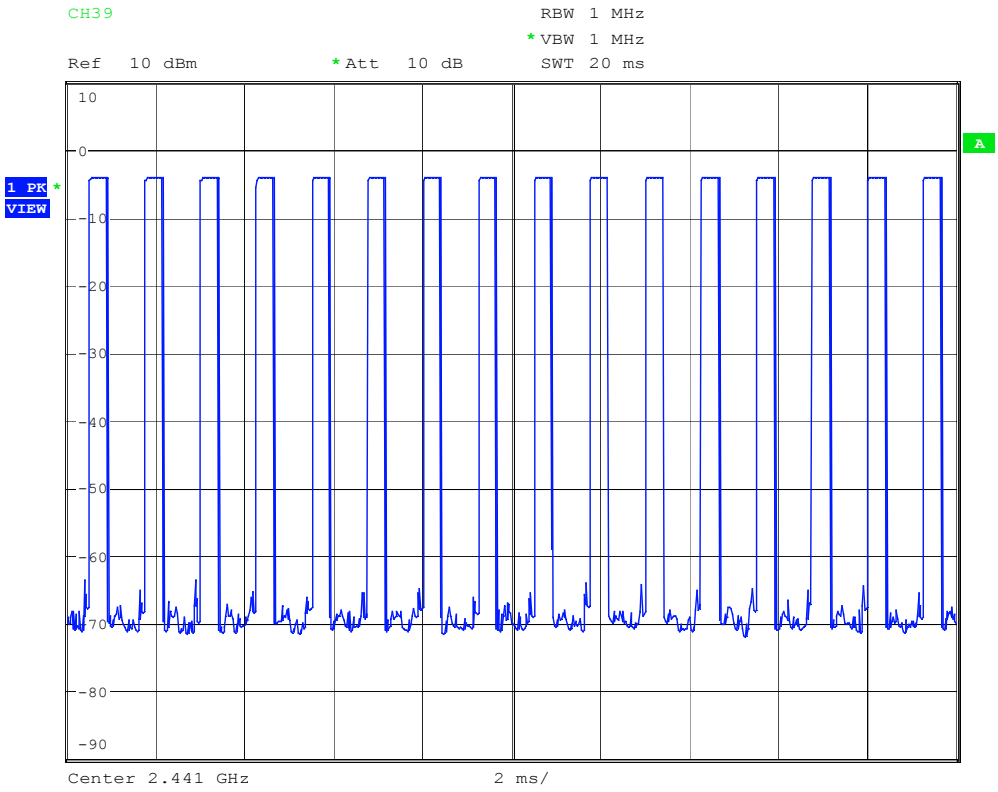
c) 2480MHz dwell time= 400.641 us× $\frac{800}{79}$ ×31.6 = 128.205 ms

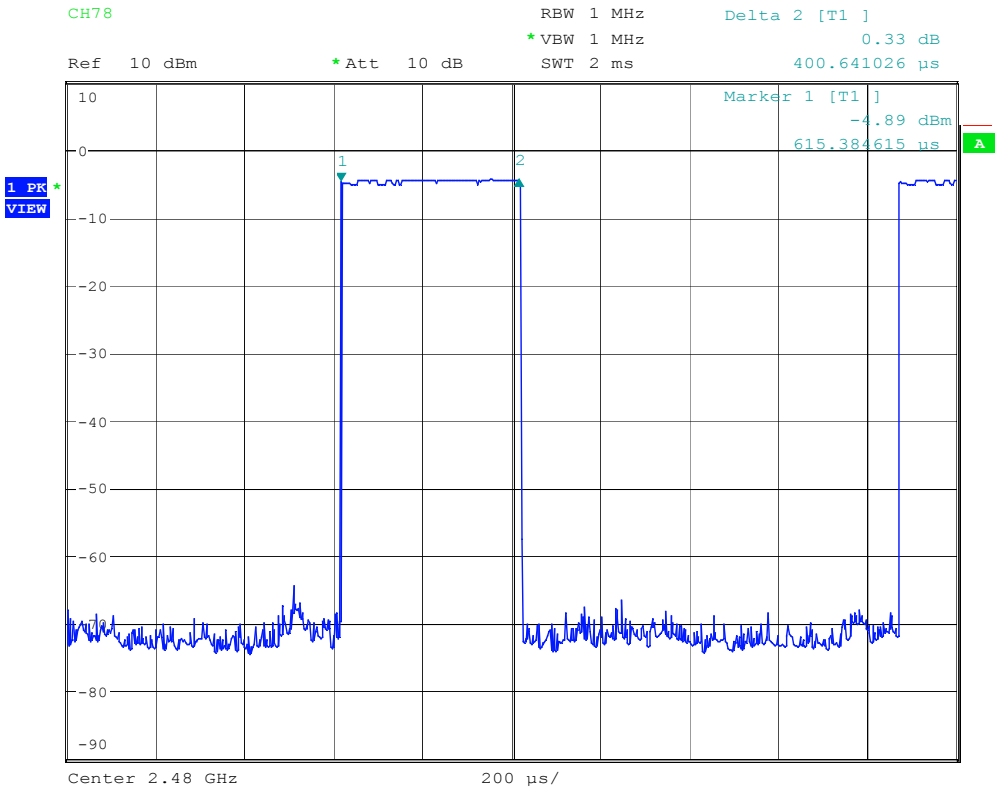
Note: Please refer to page 62 to page 67 for chart.

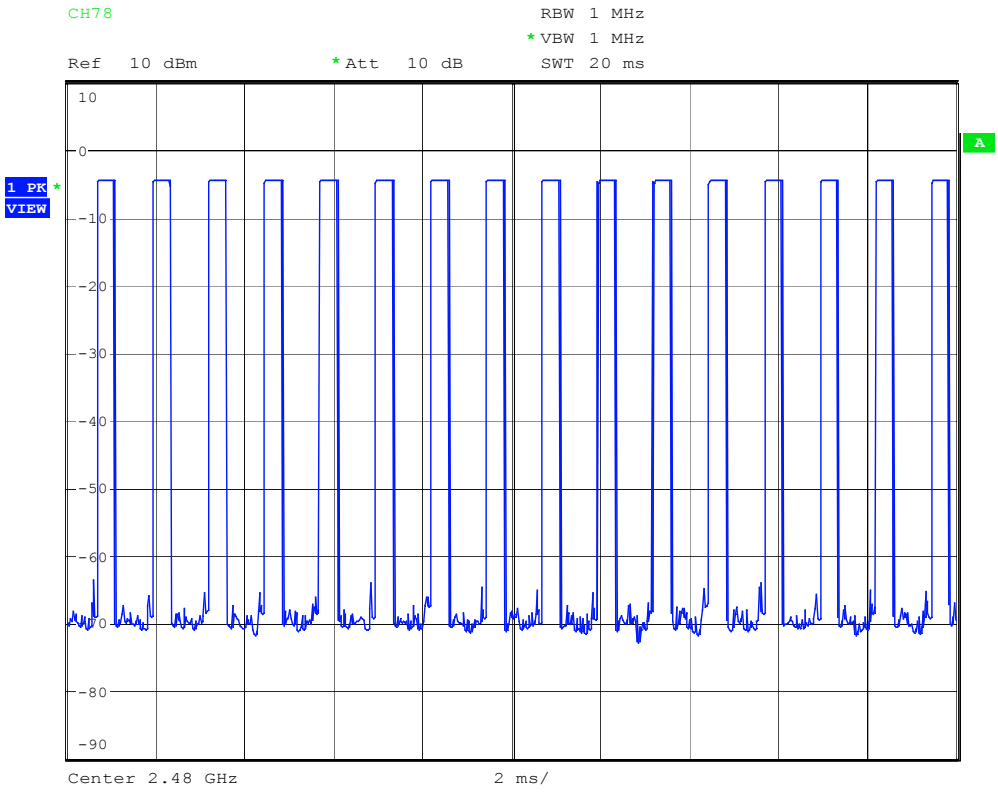

CH00
RBW 1 MHz
*VBW 1 MHz
SWT 2 ms
Delta 2 [T1]
0.36 dB
400.641026 µs
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.73 dBm
766.025641 µs
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1
2
Center 2.402 GHz
200 µs/


CH00
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 20 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
A
1 PK
VIEW
Center 2.402 GHz
2 ms/


CH39
RBW 1 MHz
*VBW 1 MHz
SWT 2 ms
Delta 2 [T1]
0.37 dB
400.641026 µs
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.53 dBm
503.205128 µs
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1
2
Center 2.441 GHz
200 µs/


CH39
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 20 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.441 GHz
2 ms/


CH78
RBW 1 MHz
* VBW 1 MHz
SWT 2 ms
Delta 2 [T1]
0.33 dB
400.641026 µs
Ref 10 dBm
* Att 10 dB
Marker 1 [T1]
-4.89 dBm
615.384615 µs
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-80
-90
Center 2.48 GHz
200 µs/


CH78
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 20 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.48 GHz
2 ms/

13.4.2 DH3

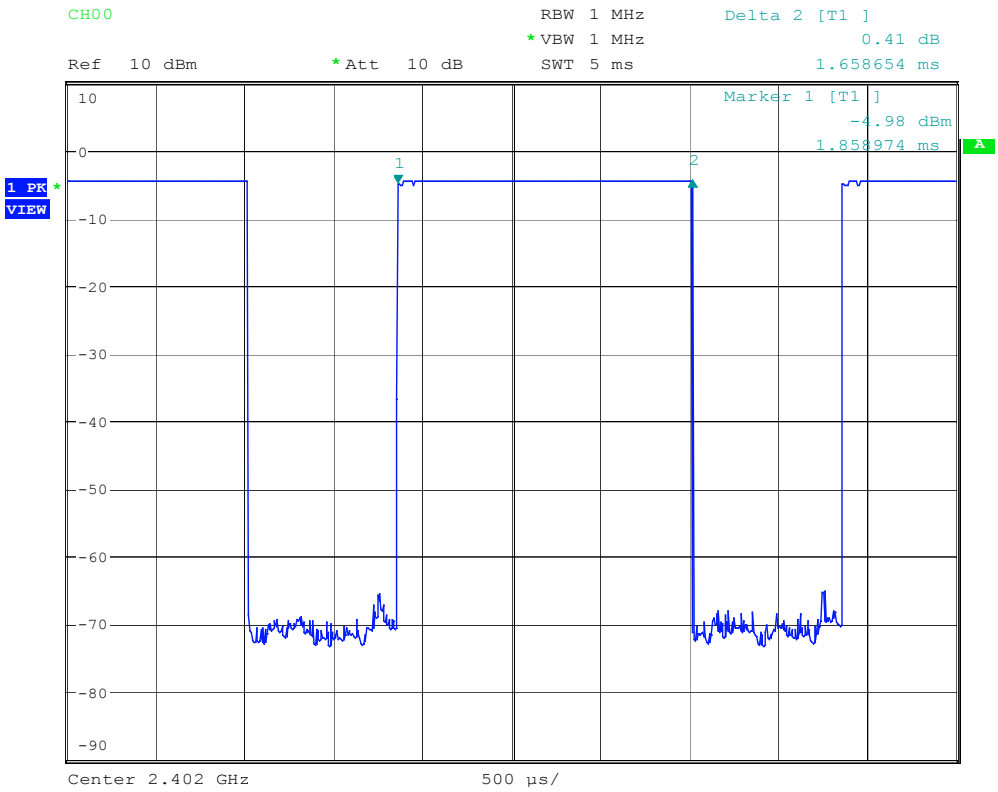
Test period=0.4(second/channel)$\times$ 79 channel=31.6sec

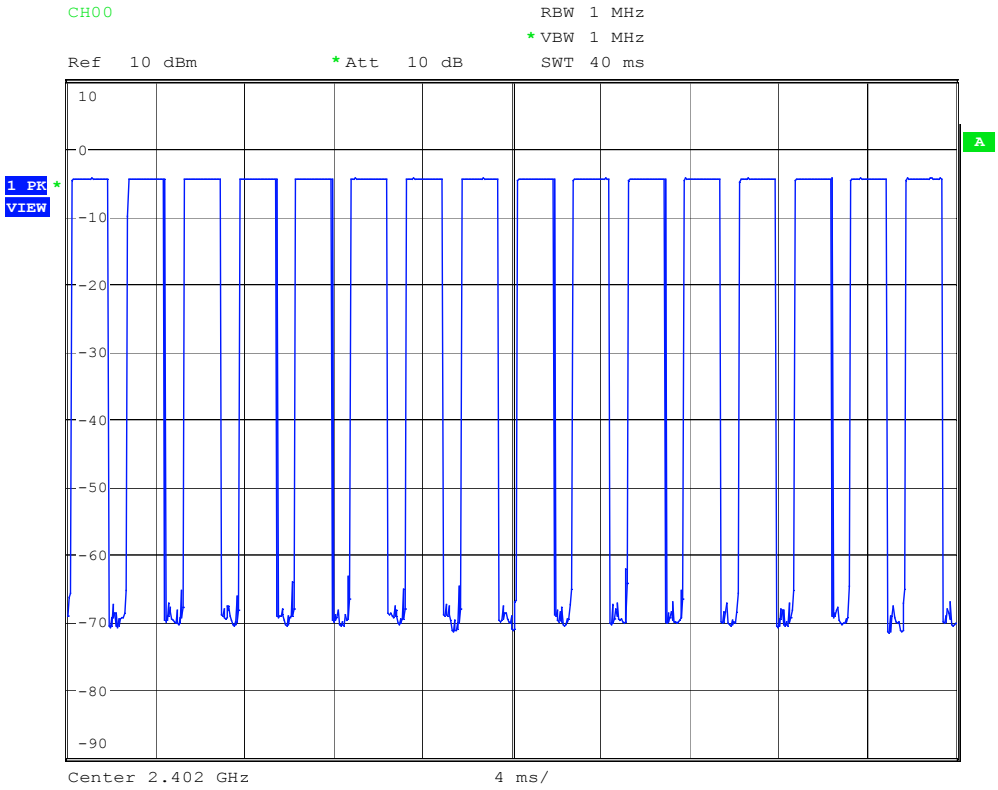
a) 2402MHz dwell time= 1.6587 ms$\times \frac{400}{79} \times 31.6$ = 265.392 ms

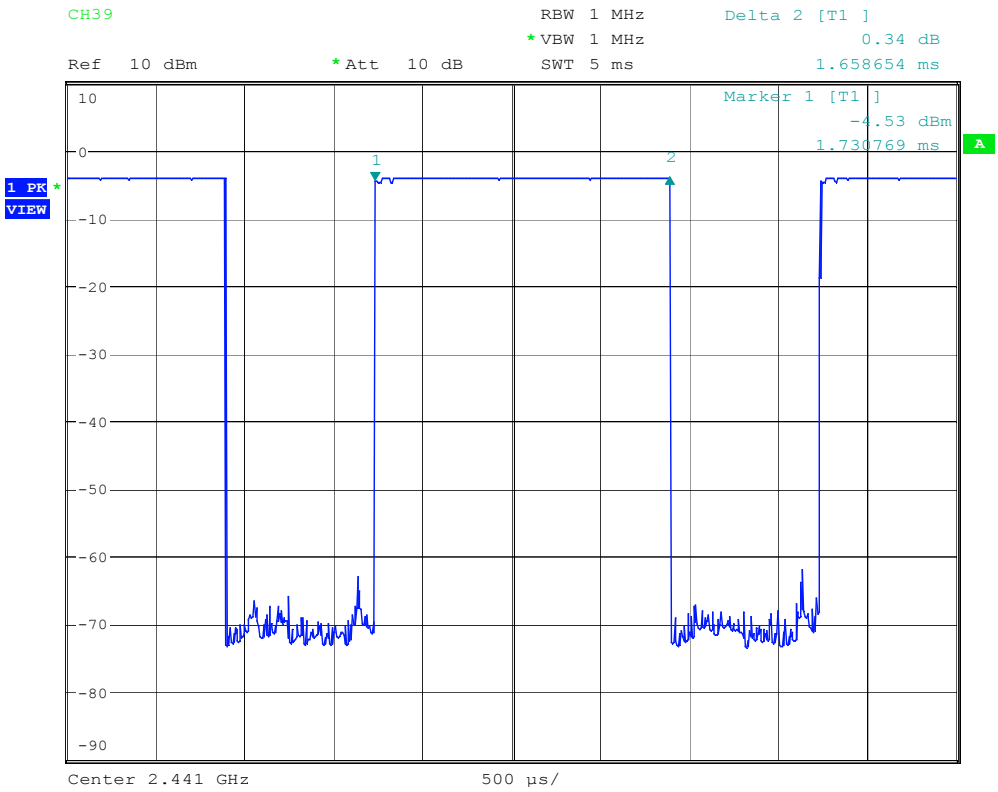
b) 2441MHz dwell time= 1.6587 ms$\times \frac{400}{79} \times 31.6$ = 265.392 ms

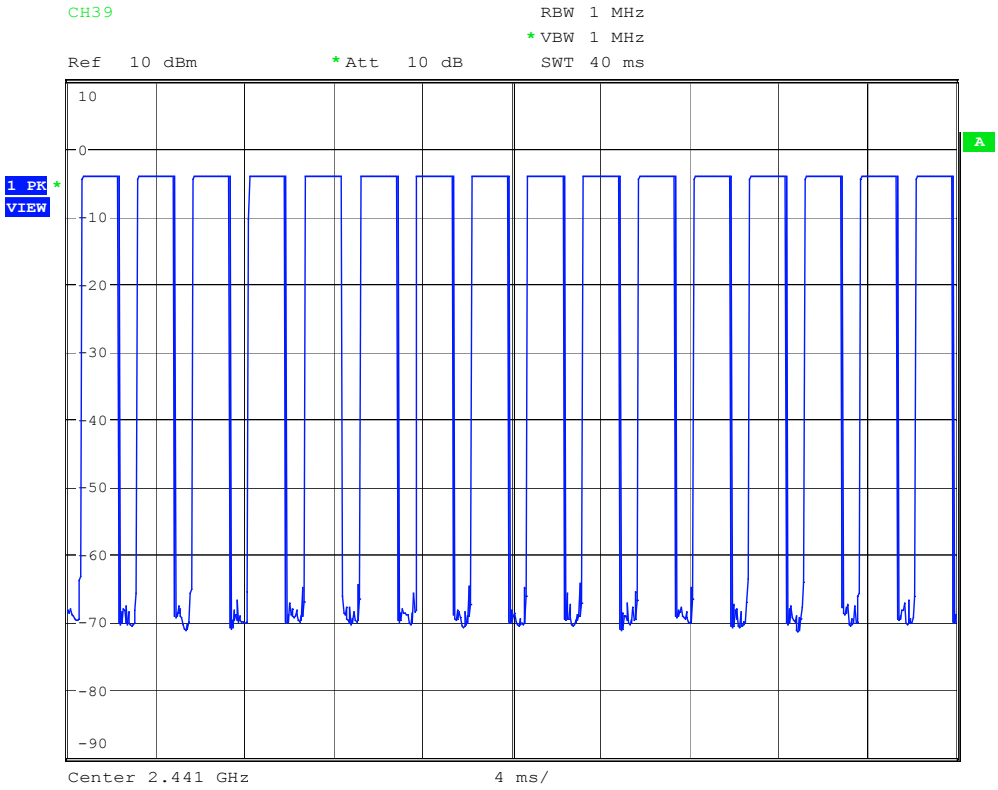
c) 2480MHz dwell time= 1.6587 ms$\times \frac{400}{79} \times 31.6$ = 265.392 ms

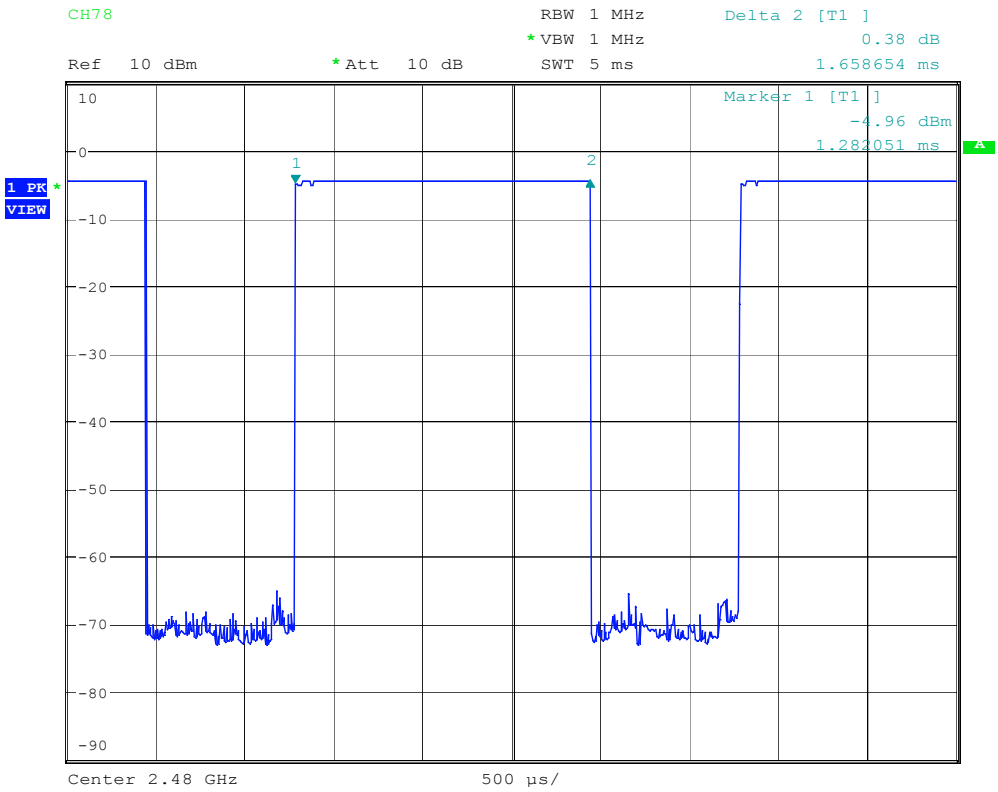
Note: Please refer to page 69 to page 74 for chart.

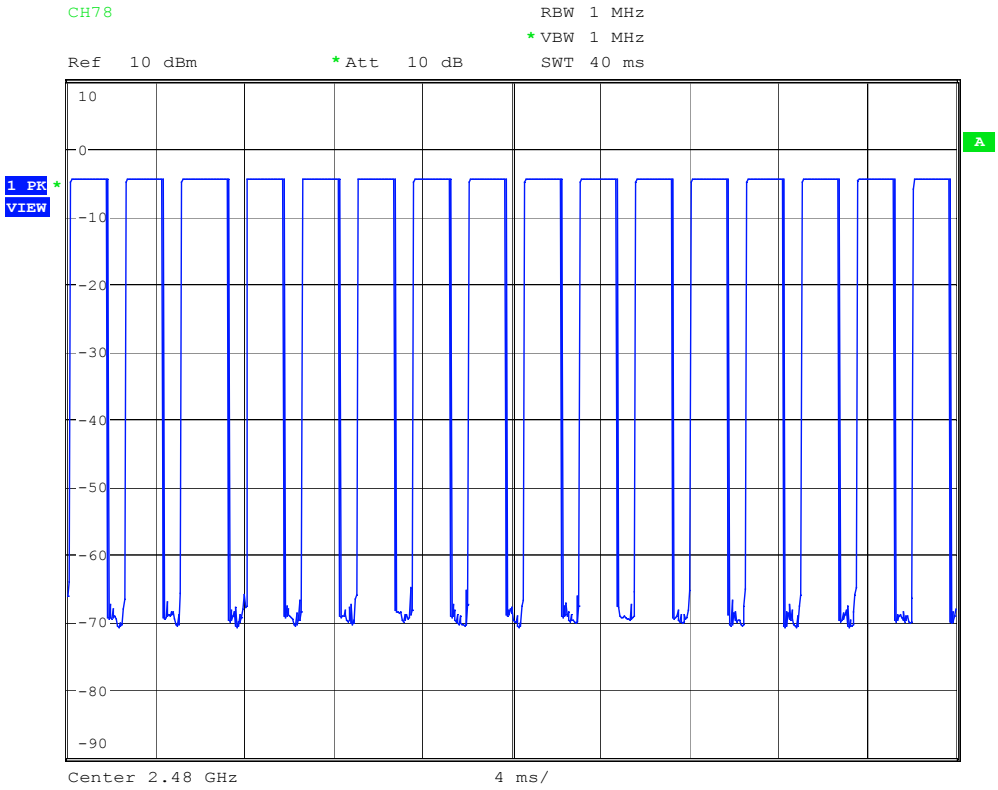

CH00
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
0.41 dB
1.658654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.98 dBm
1.858974 ms
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.402 GHz
500 µs/


CH00
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 40 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.402 GHz
4 ms/


CH39
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
0.34 dB
1.658654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.53 dBm
1.730769 ms
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1
2
Center 2.441 GHz
500 µs/


CH39
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 40 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.441 GHz
4 ms/


CH78
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
0.38 dB
1.658654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.96 dBm
1.282051 ms
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
500 µs/


CH78
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 40 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.48 GHz
4 ms/

13.4.3 DH5

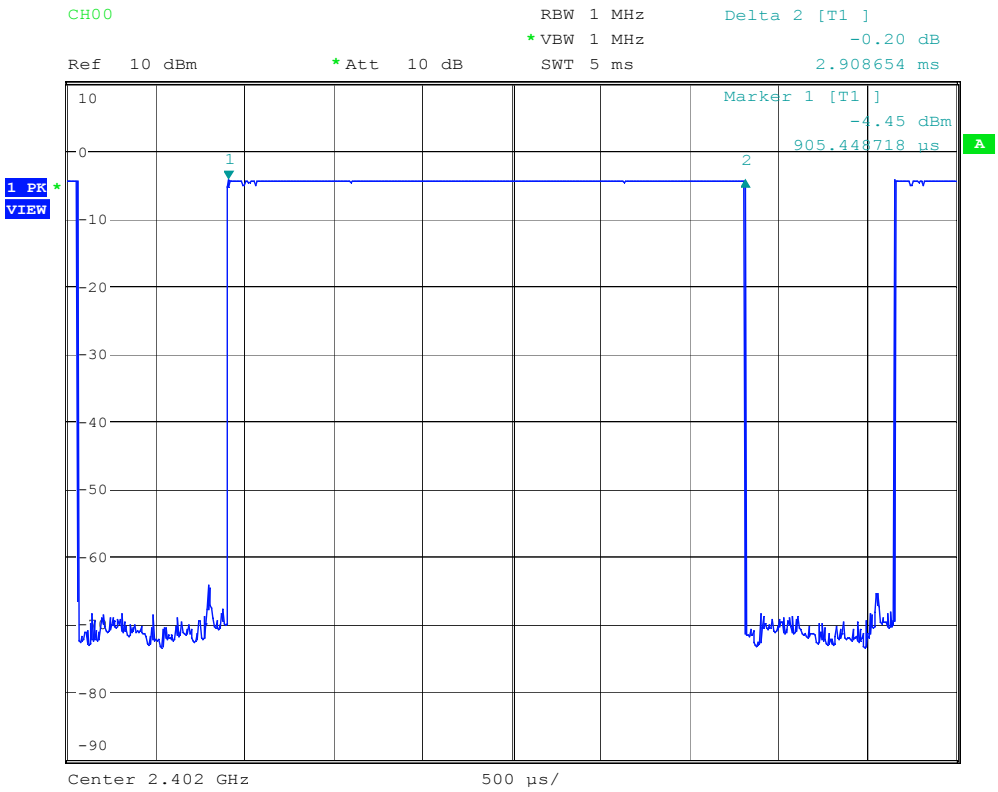
Test period=0.4(second/channel)$\times$ 79 channel=31.6sec

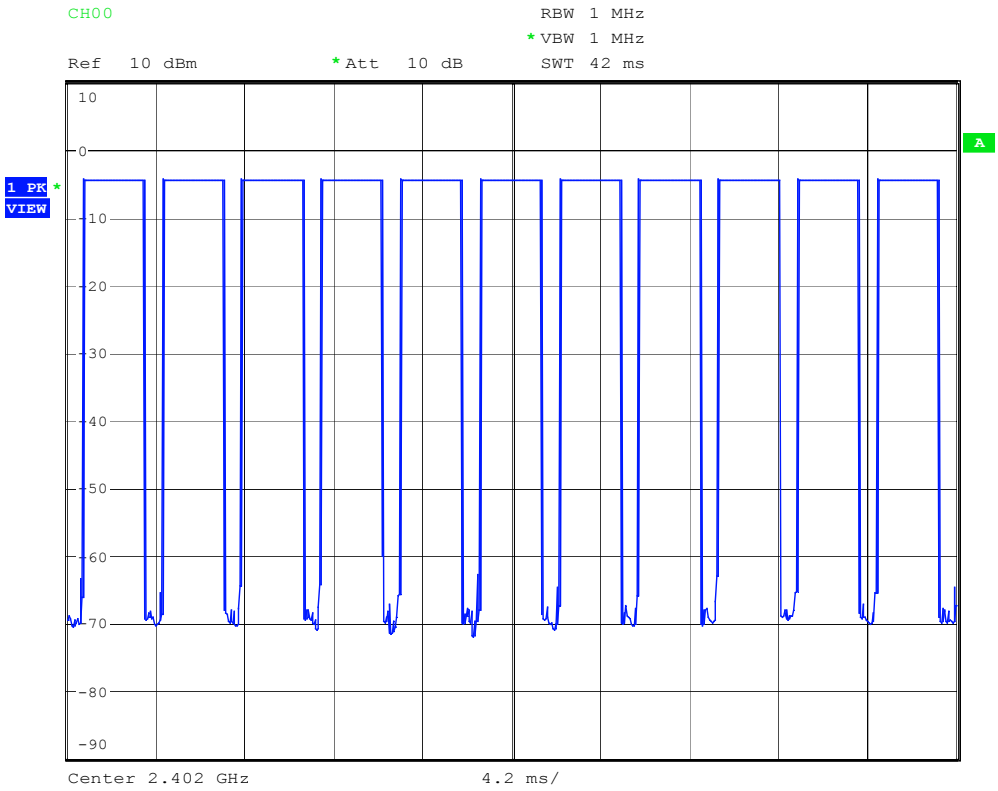
a) 2402MHz dwell time= 2.9087 ms$\times \frac{262}{79} \times 31.6$ = 304.832 ms

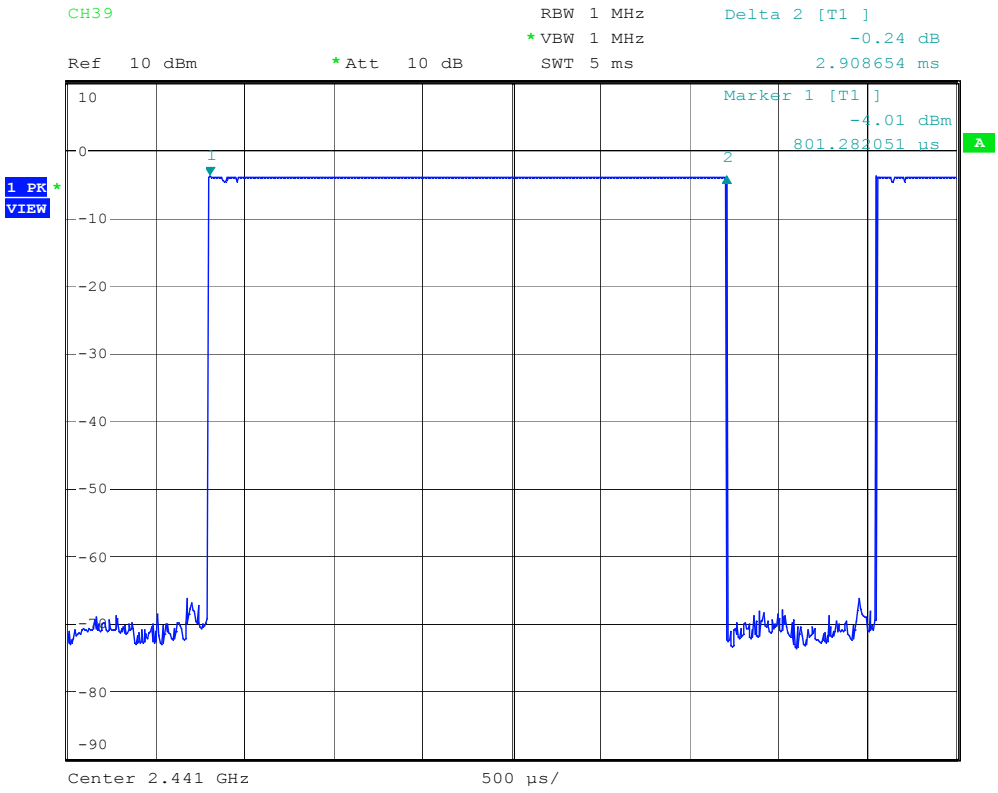
b) 2441MHz dwell time= 2.9087 ms$\times \frac{262}{79} \times 31.6$ = 304.832 ms

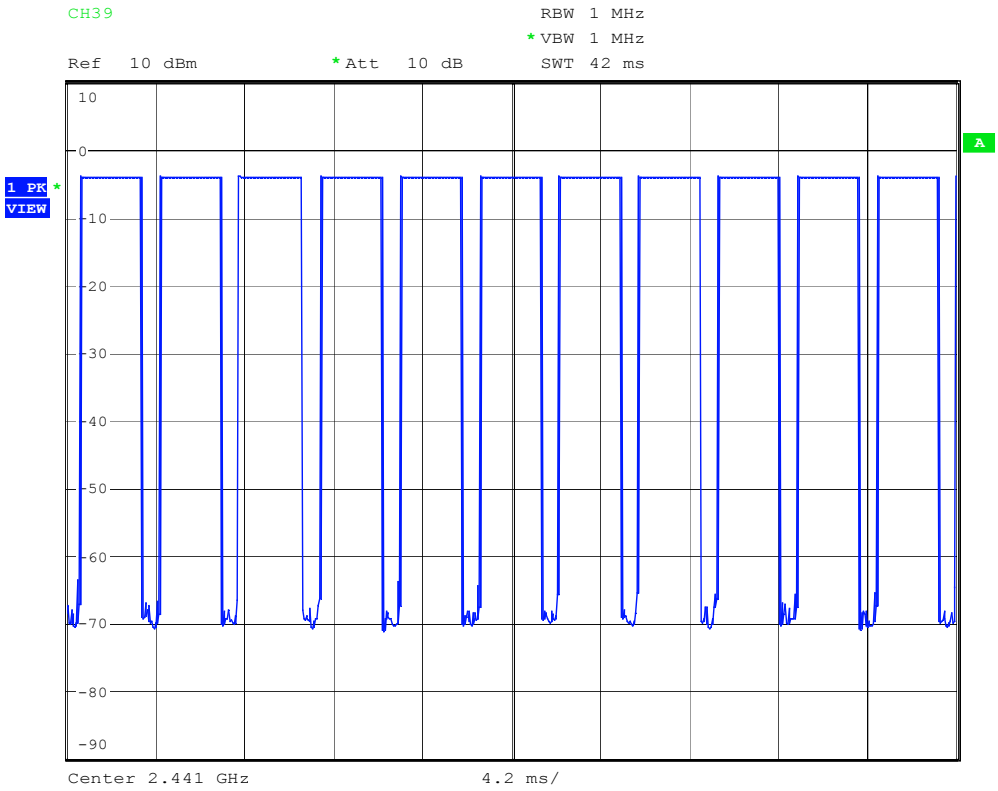
c) 2480MHz dwell time= 2.9087 ms$\times \frac{262}{79} \times 31.6$ = 304.832 ms

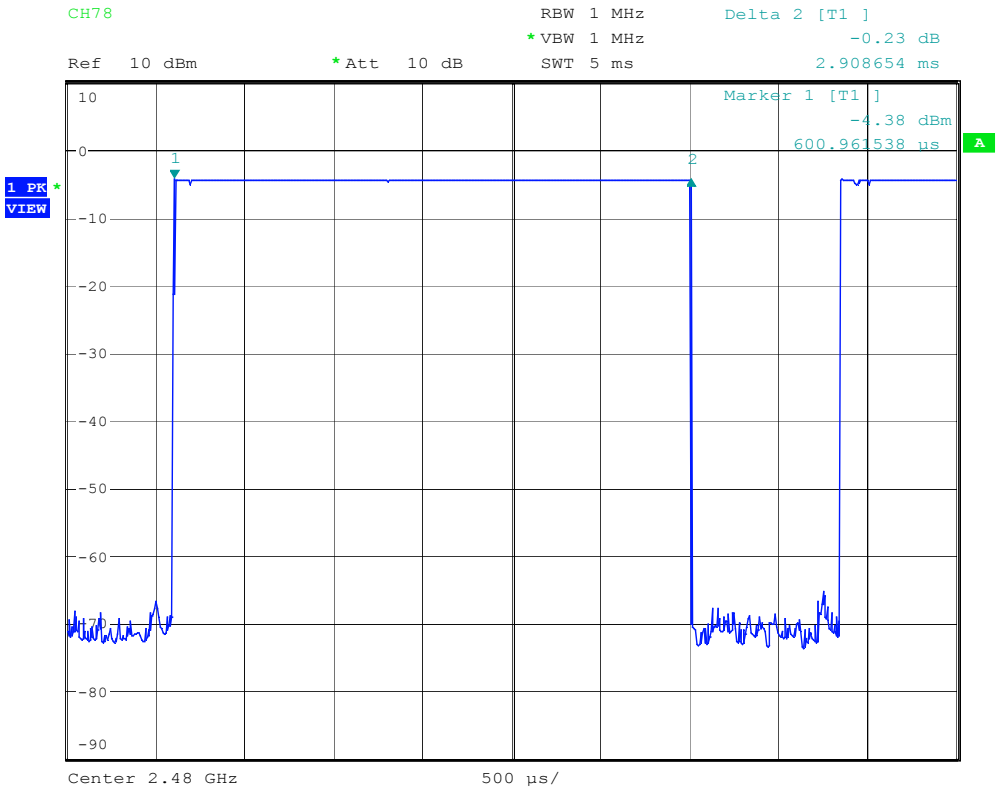
Note: Please refer to page 76 to page 81 for chart.

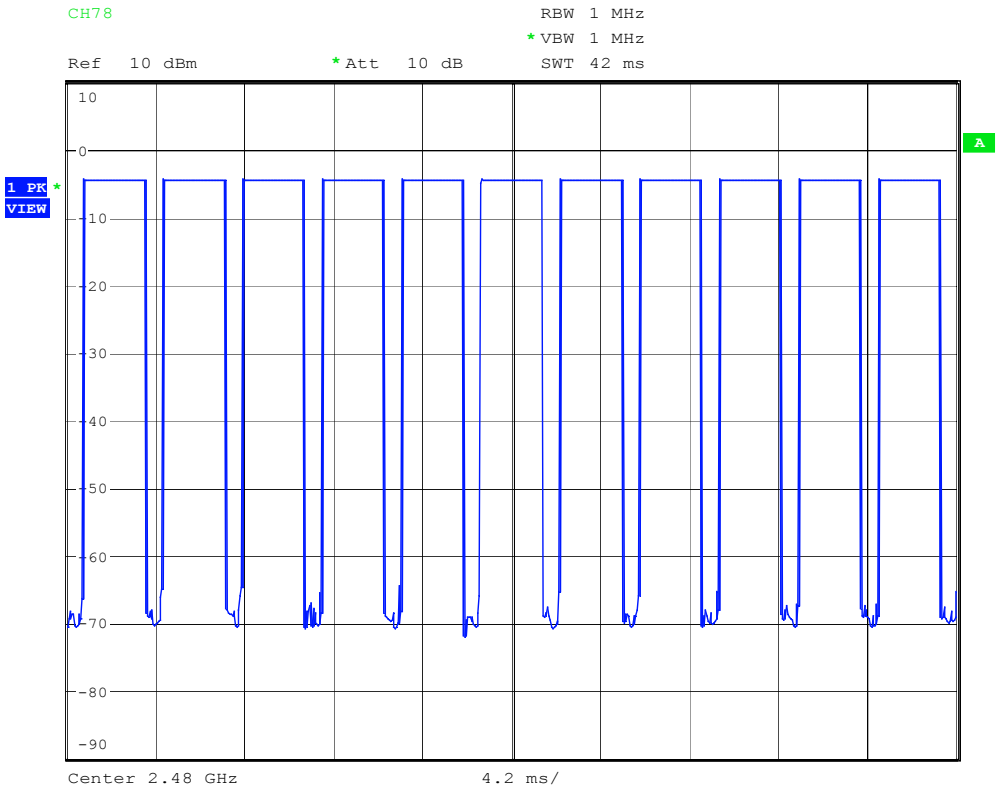

CH00
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
-0.20 dB
2.908654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.45 dBm
905.448718 µs
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-80
-90
Center 2.402 GHz
500 µs/


CH00
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 42 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.402 GHz
4.2 ms/


CH39
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
-0.24 dB
2.908654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.01 dBm
801.282051 µs
1 PK
VIEW
A
10
0
-10
-20
-30
-40
-50
-60
-80
-90
Center 2.441 GHz
500 µs/


CH39
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 42 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.441 GHz
4.2 ms/


CH78
RBW 1 MHz
*VBW 1 MHz
SWT 5 ms
Delta 2 [T1]
-0.23 dB
2.908654 ms
Ref 10 dBm
*Att 10 dB
Marker 1 [T1]
-4.38 dBm
600.961538 µs
A
1 PK
VIEW
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.48 GHz
500 µs/


CH78
RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 10 dB
SWT 42 ms
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1 PK
VIEW
A
Center 2.48 GHz
4.2 ms/