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

Report No.: 09-12-MAS-279-01

Client:	IQ-Group Sdn. Bhd. (Representative Office)
Product:	Wireless Door Camera
Model:	VD-8810C
FCC ID:	SFV-09VD8810C
Manufacturer/supplier:	IQ Group (Dongguan) Ltd.

Date test item received:	2009/11/10
Date test campaign completed:	2009/12/21
Date of issue:	2010/01/13

Total number of pages of this test report: 50 pages
Total number of pages of photos: External photos 1 pages
Internal photos 7 pages
Setup photos 1 pages

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Manufacturer	: IQ Group (Dongguan) Ltd.
Address	: Xi Xi Industrial Region, Liao Bu Town, Dongguan City, Guang Dong Province, China 523402
EUT	: Wireless Door Camera
Trade name	: Home Depot
Model No.	: VD-8810C
Power Source	: 4.5V dc
Regulations applied	: FCC 47 CFR, Part 15 Subpart C (2008)

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.

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⑤ FCC Registration Number: 90588, 91094, 91095

⑥ Industry Canada Site Regisitation number: IC 2949A-1

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Wireless Door Camera
b) Trade Name : Home Depot
c) Model No. : VD-8810C
d) FCC ID : SFV-09VD8810C

1.2 Characteristics of Device

The EUT is a Wireless Door Camera based on the Frequency Hopping Spread Spectrum (FHSS) technology. When a visitor presses the push button of camera, ring tones can be heard and the camera image will show on the LCD monitor. Press the "ANSWER" button of LCD monitor can talk to the visitor for up to 60 seconds. Press "OFF" button will finish the conversation. And EUT operates in the unlicensed ISM Band at 2.4GHz. In this band, 31 RF channels spaced 2MHz apart are defined. The rated output power is 16.17 dBm (41.40 mW).

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
20	2410	48	2424	76	2438	104	2452	132	2466
24	2412	52	2426	80	2440	108	2454	136	2468
28	2414	56	2428	84	2442	112	2456	140	2470
32	2416	60	2430	88	2444	116	2458		
36	2418	64	2432	92	2446	120	2460		
40	2420	68	2434	96	2448	124	2462		
44	2422	72	2436	100	2450	128	2464		

1.3 Test Methodology

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

1.4 Modifiction List of EUT

N/A

1.5 Test Facility

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

1.6 Test Summary

Requirement	FCC Paragraph #	Test Pass
Radiated Emission	15.247 (d)	☒
Conducted Emission	15.207	☒
Antenna Requirement	15.203	☒
Emission Bandwidth	15.247 (a)(2)	☒
Output Power Requirement	15.247 (b)	☒
Power Density Requirement	15.247 (e)	☒
Spurious Emissions	15.247 (d)	☒

2 PROVISIONS APPLICABLE

2.1 Definition

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

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

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

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

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

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

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

Frequency MHz	Quasi Peak dB 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. For all other frequeny hopping system in the 2400 – 2483.5 MHz band shall not exeed 0.125 Watts. 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. Monitor 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
* Wireless Door Camera	IQ Group (Dongguan) Ltd.	VD-8810C	----
Alkaline Battery* 6	DURACELL	MN1500	----

Remark

1. "*" means equipment under test.

2.

CH Low	Ch28	2410 MHz
CH Mid	Ch61	2440 MHz
CH High	Ch31	2470 MHz

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

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

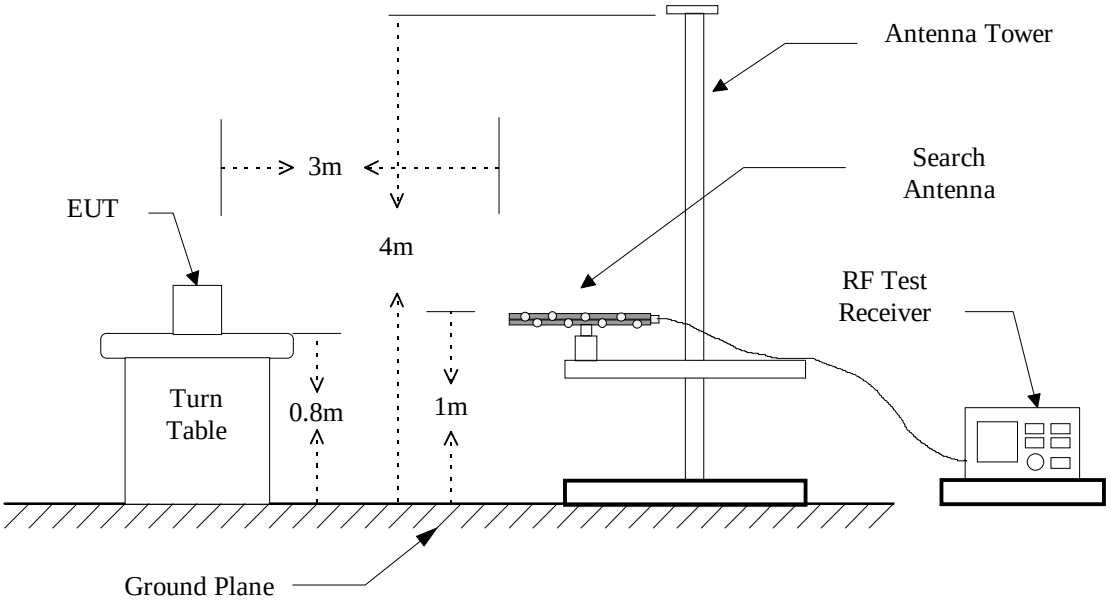
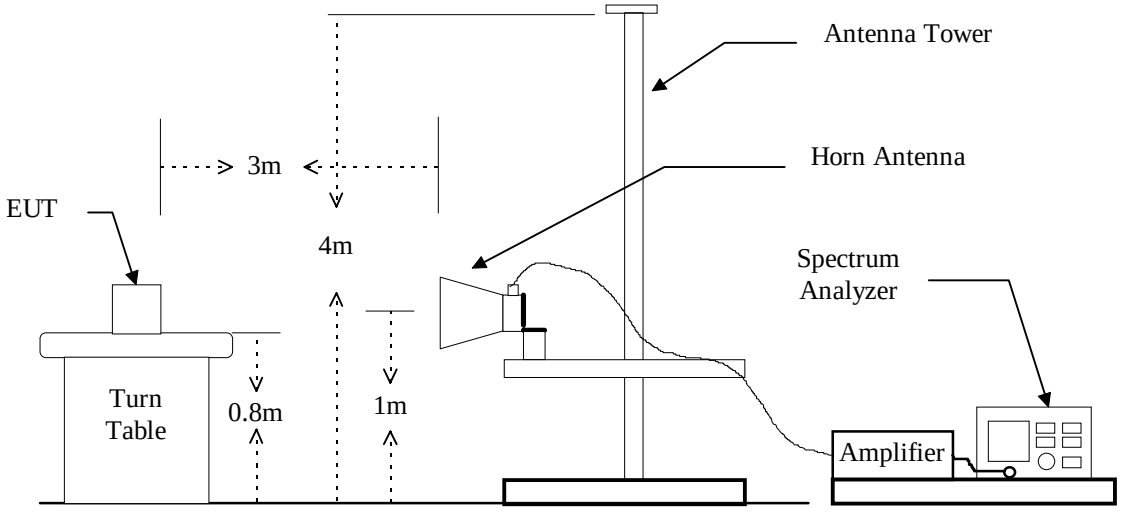


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Next Cal. Due
EMI Test Receiver	R&S	ESIB7	07/19/2010
Spectrum Analyzer	Rohde & Schwarz	FSU46	11/18/2010
Horn Antenna	EMCO	3115	12/10/2010
BiLog Antenna	Schaffner	CBL 6112B	08/18/2010
Horn Antenna	EMCO	3116	07/13/2010
Preamplifier	Hewlett-Packard	8449B	10/11/2010

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 20

Operation Mode : Transmitting
Fundamental Frequency : 2410 MHz
Test Date : Nov. 10, 2009 Temperature : 26℃ Humidity : 68%

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4820.000	57.3	50.3	64.3	55.8	-2.1	62.2	53.7	74.0	54.0

b) Channel 80
Fundamental Frequency : 2440 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4880.000	58.5	50.8	65.1	55.5	-2.1	63.0	53.4	74.0	54.0
7320.000	54.0	45.4	60.5	51.7	1.0	61.5	52.7	74.0	54.0

c) Channel 140
Fundamental Frequency : 2470 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4940.000	57.0	49.5	62.2	54.1	-2.1	60.1	52.0	74.0	54.0
7410.000	54.8	44.9	59.8	50.0	1.0	60.8	51.0	74.0	54.0

Note :

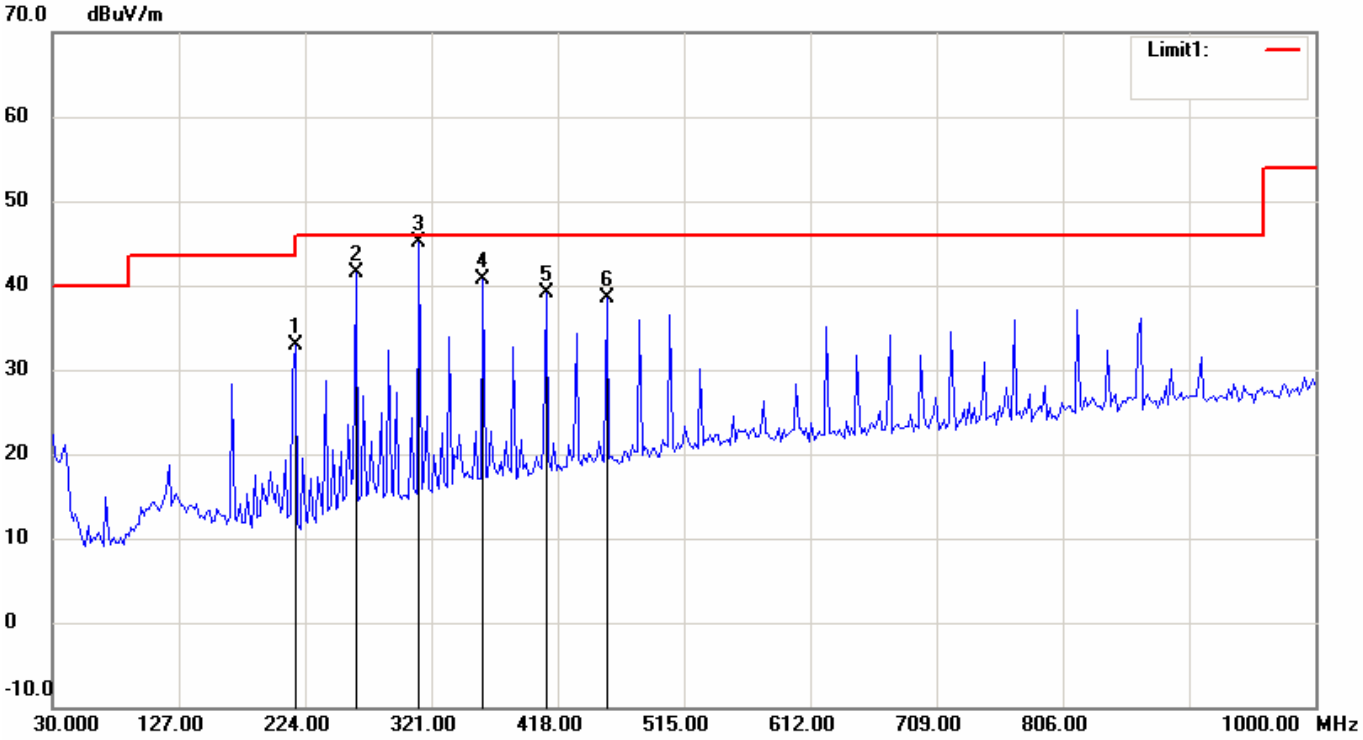
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.
3. Item "Margin" referred to Average limit while there is only peak result.
4. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental 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 below 1GHz

File: 24TR **Data:** #58 **Date:** 2009/11/10 **Temperature:** 26 ℃

Time: AM 09:59:44 **Humidity:** 68 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal

EUT: T - EUTX **Distance:** 3m

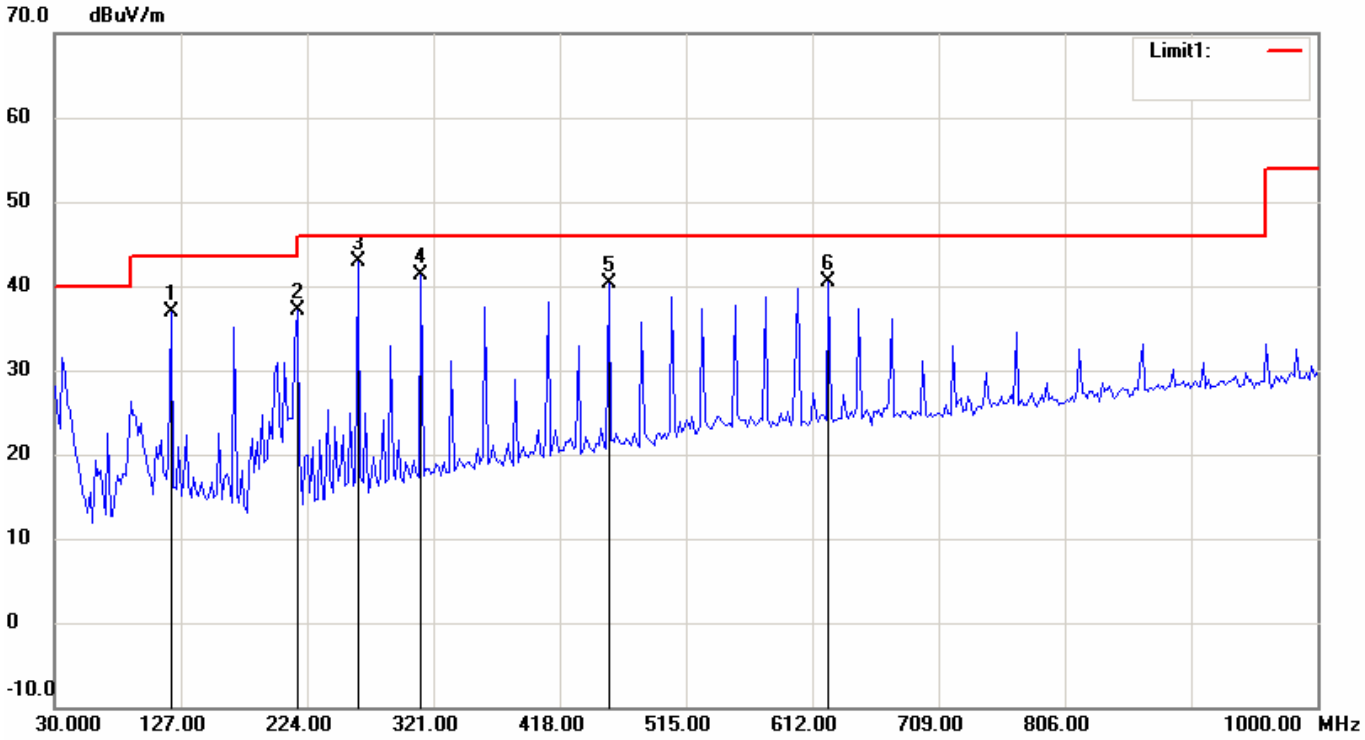
Model: VD-8810C

Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	216.6132	20.19	peak	12.81	33.00	46.00	-13.00
2	263.2665	25.78	peak	15.70	41.48	46.00	-4.52
3	311.8637	26.78	QP	16.38	43.16	46.00	-2.84
4	360.4609	22.72	peak	17.96	40.68	46.00	-5.32
5	409.0581	19.82	peak	19.23	39.05	46.00	-6.95
6	455.7114	18.61	peak	19.90	38.51	46.00	-7.49

File: 24TR **Data:** #63 **Date:** 2009/11/10 **Temperature:** 26 ℃

Time: PM 01:58:47 **Humidity:** 68 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Vertical

EUT: T - EUTX **Distance:** 3m

Model: VD-8810C

Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	119.4188	22.76	peak	14.06	36.82	43.50	-6.68
2	216.6132	24.25	peak	12.81	37.06	46.00	-8.94
3	263.2665	27.12	peak	15.70	42.82	46.00	-3.18
4	311.8636	24.99	peak	16.38	41.37	46.00	-4.63
5	455.7114	20.37	peak	19.90	40.27	46.00	-5.73
6	624.8297	17.93	peak	22.60	40.53	46.00	-5.47

4.4.2.2 above 1GHz

4.4.2.2.1 Operation Mode : CH 20, 2410 MHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1206.4	54.9	36.7	59.4	41.3	-14.6	44.8	26.7	74.0	54.0
2483.5	59.4	40.6	59.7	41.2	-8.1	51.6	33.1	74.0	54.0

4.4.2.2.2 Operation Mode : CH 80, 2440 MHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1219.9	55.6	37.2	58.3	36.1	-14.6	43.7	22.6	74.0	54.0
2390.0	67.3	38.1	71.4	38.8	-8.1	63.3	30.7	74.0	54.0
2488.1	65.6	38.6	70.7	41.4	-8.1	62.6	33.3	74.0	54.0

4.4.2.2.3 Operation Mode : CH 140, 2470 MHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1235.6	54.9	35.1	57.8	36.2	-14.6	43.2	21.6	74.0	54.0
2390.0	63.8	35.4	68.1	35.8	-8.1	60.0	27.7	74.0	54.0

Note:
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f<1000MHz).
   ±4.1dB (1GHz≦f≦18GHz).
   ±4.4dB (18GHz<f≦40GHz).

4 Remark “---” means that the emissions level is too low to be measured.

4.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies

(A)

Channel 20

Operation Mode : TR Mode

Fundamental Frequency : 2410 MHz

Test Date : Nov. 10, 2009 Temperature : 26℃ Humidity : 68%

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.
2389.744	36.3	16.2	38.0	15.8	29.8	67.8	46.0	74.0	54.0

Note:

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

(B)

Channel 140

Operation Mode : TR Mode

Fundamental Frequency : 2470 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.
2483.500	40.0	15.6	38.6	15.5	29.8	69.8	45.4	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

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to §15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

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

Antenna Type	Monopole Antenna
Model Number	N/A
Brand Name	N/A
Peak Antenna Gain	2.04 dBi
Antenna Size	L: 19.4mm，Φ: 0.4 mm

The directional gain of antenna doesn’t greater than 6 dBi, the power won’t be reduced.

7 20dB EMISSION BANDWIDTH MEASUREMENT

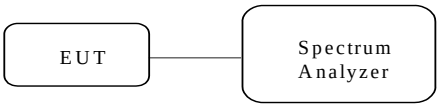
7.1 Standard Applicable

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 3. 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 3: Emission bandwidth measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

7.4 Measurement Data

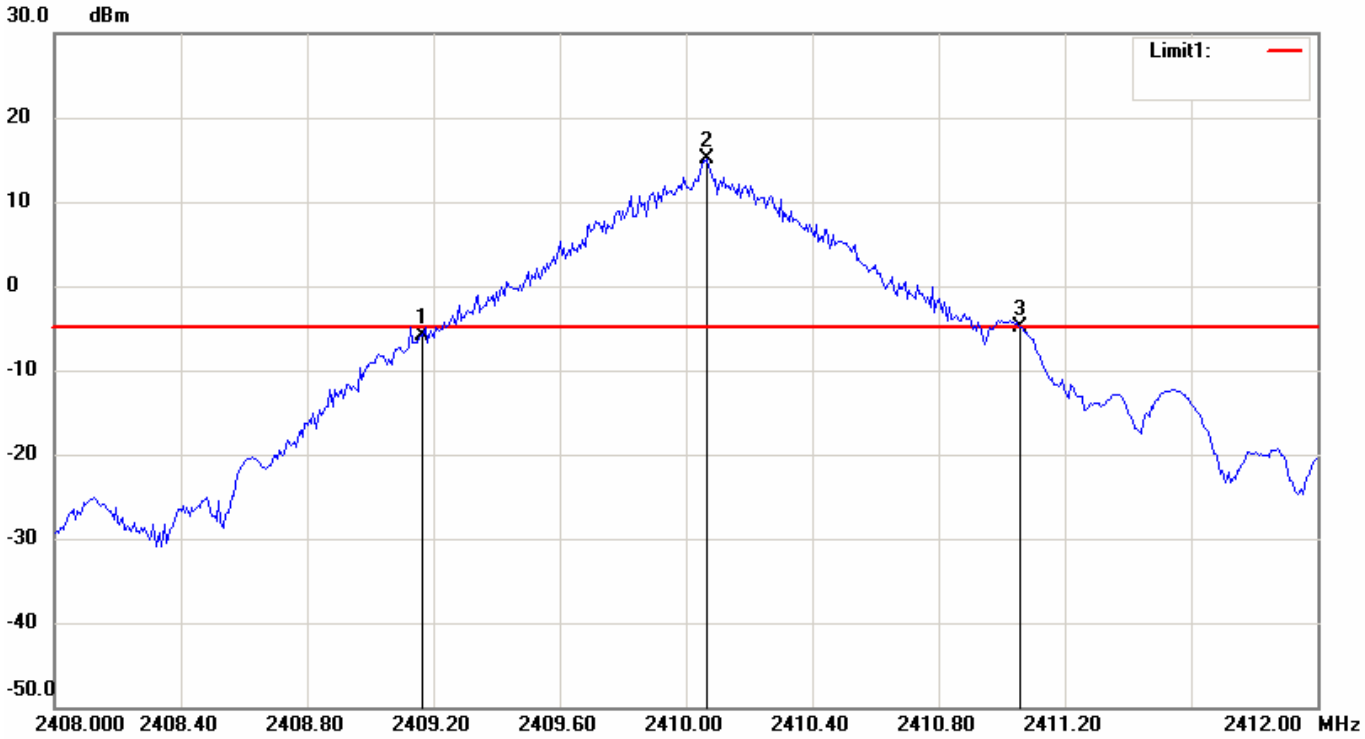
Test Date : Dec. 21, 2009 Temperature : 18℃ Humidity : 51%

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)	Chart
20	2410	1.893	Page 24
80	2440	1.733	Page 25
140	2470	1.633	Page 26

Note: Please refer to page 24 to page 26 for chart.

File: **24TR 1119** **Data:** **#154** **Date:** **2009/12/21** **Temperature:** **18 ℃**

Time: **PM 04:16:11** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 3.2ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC- Channel L-20dB EBW**

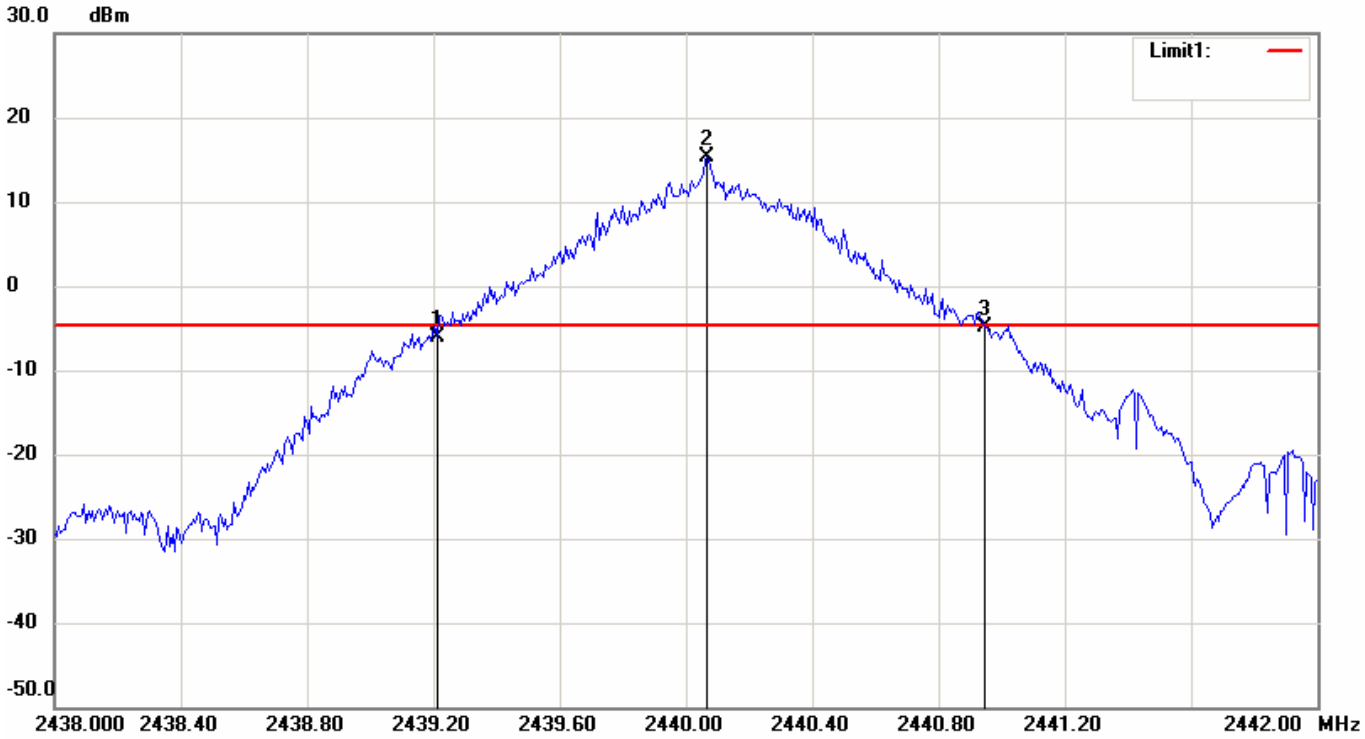
Note:

No.	Frequency(MHz)	Level(dBm)
1	2409.1667	-5.88
2	2410.0667	15.13
3	2411.0600	-4.99

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.8933	0.89

File: **24TR 1119** **Data:** **#77** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **PM 03:12:49** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 3.2ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC- Channel M-20dB EBW**

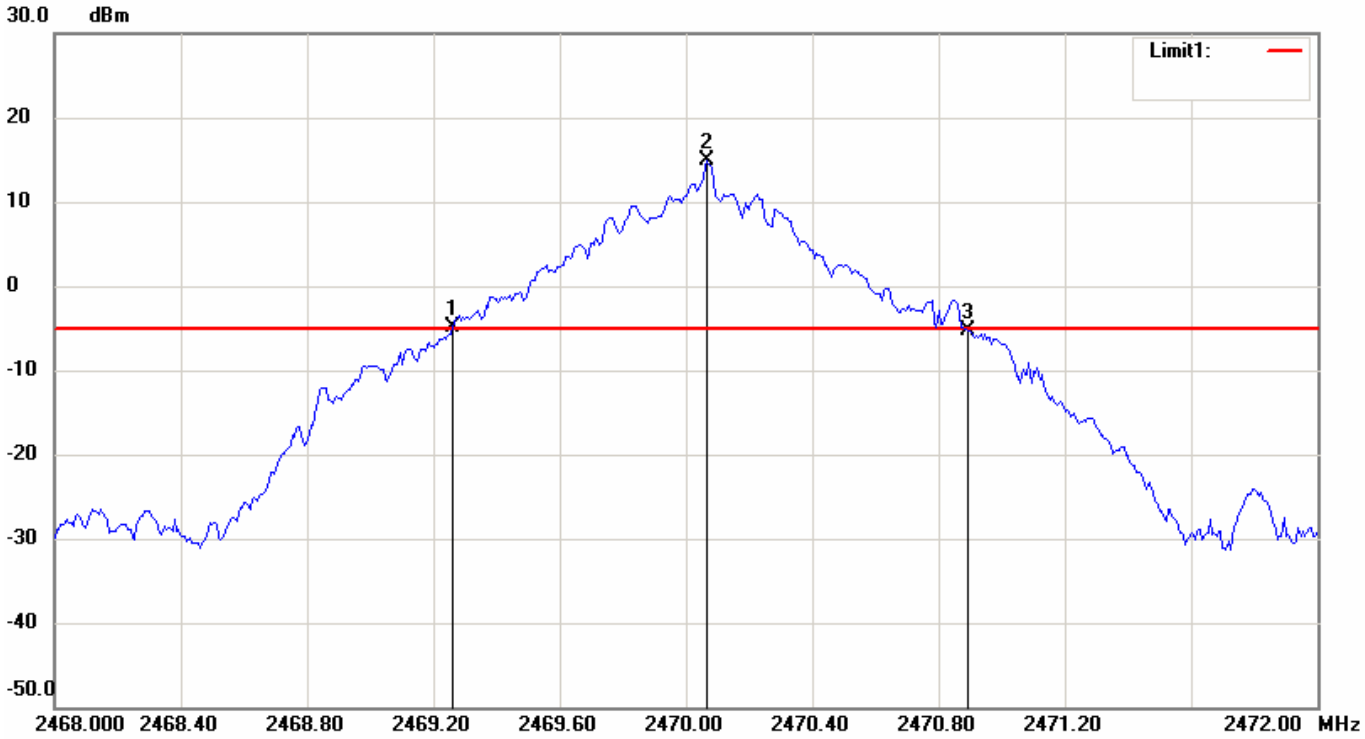
Note:

No.	Frequency(MHz)	Level(dBm)
1	2439.2133	-6.11
2	2440.0667	15.38
3	2440.9467	-4.95

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.7334	1.16

File: **24TR 1119** **Data:** **#59** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **PM 02:48:01** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 3.2ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC- Channel H-20dB EBW**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2469.2600	-4.81
2	2470.0667	14.82
3	2470.8933	-5.25

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.6333	-0.44

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 3. 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	Agilent	E4446A	09/27/2010

8.4 Measurement Data

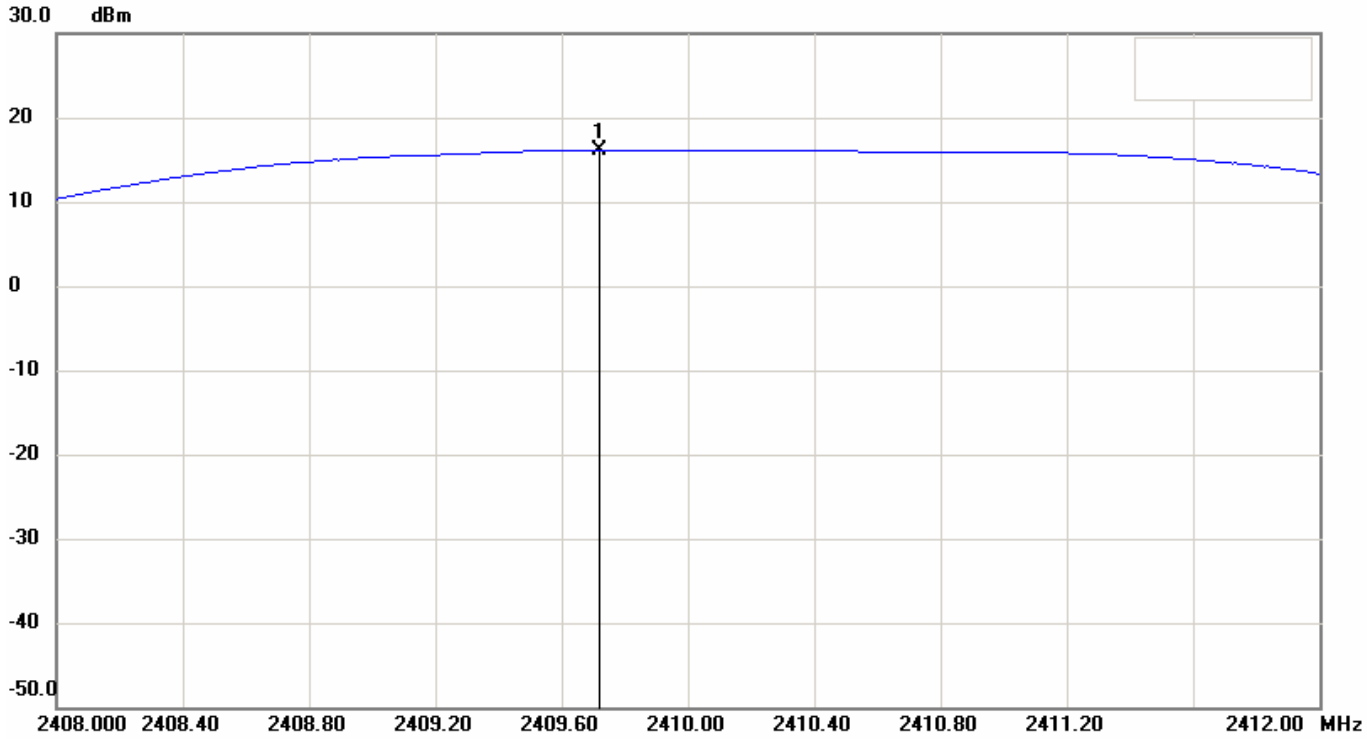
Test Date : Dec. 21, 2009 Temperature : 18℃ Humidity : 51%

Channel	Frequency (MHz)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
20	2410	16.15	41.21	1000	Page 29
80	2440	16.17	41.40	1000	Page 30
140	2470	15.52	36.65	1000	Page 31

Note: Please refer to page 29 to page 31 for chart.

File: 24TR 1119 **Data: #151** **Date: 2009/12/21** **Temperature: 18 ℃**

Time: PM 04:13:55 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms Att.: 30dB**

Model: **VD-8810C** **RBW: 1000 KHz VBW: 3000 KHz**

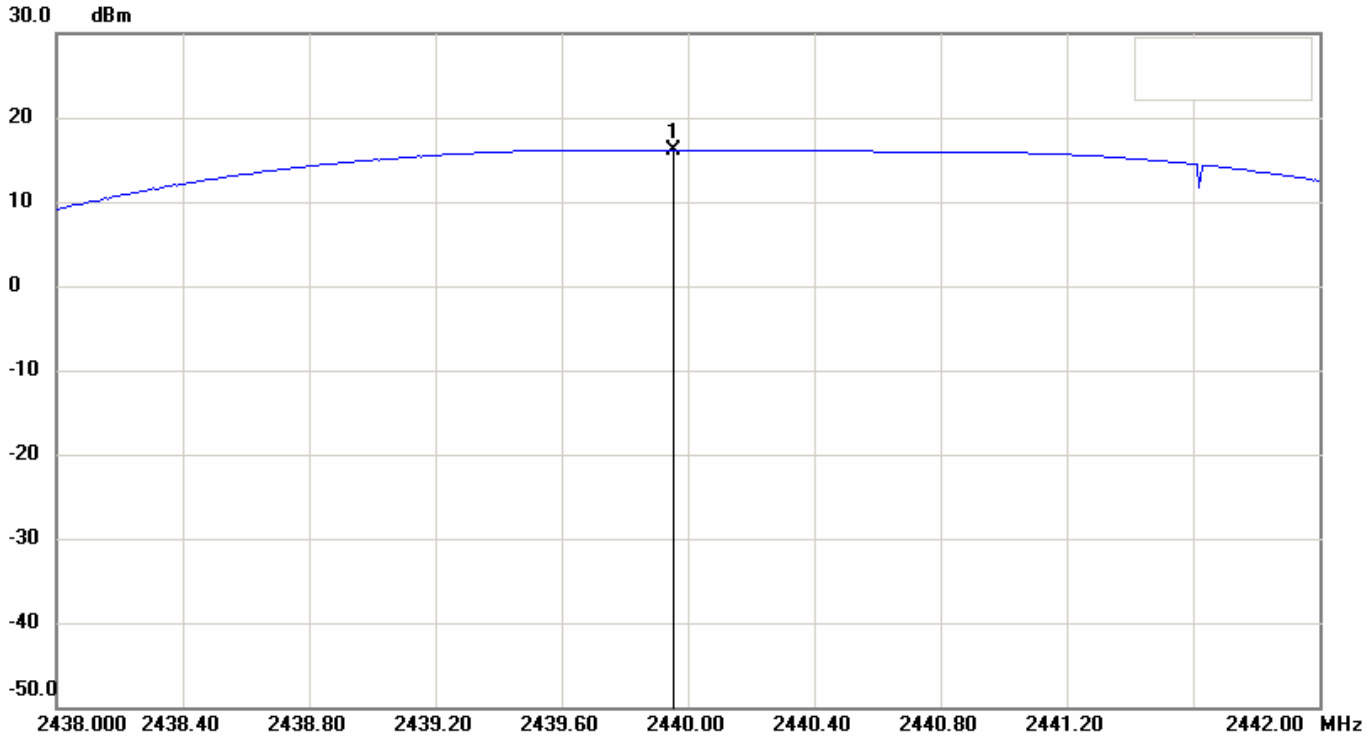
Test Mode: **FCC CHL Output Power**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2409.7200	16.15

File: **24TR 1119** **Data:** **#73** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **PM 03:11:16** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 1000 KHz** **VBW: 3000 KHz**

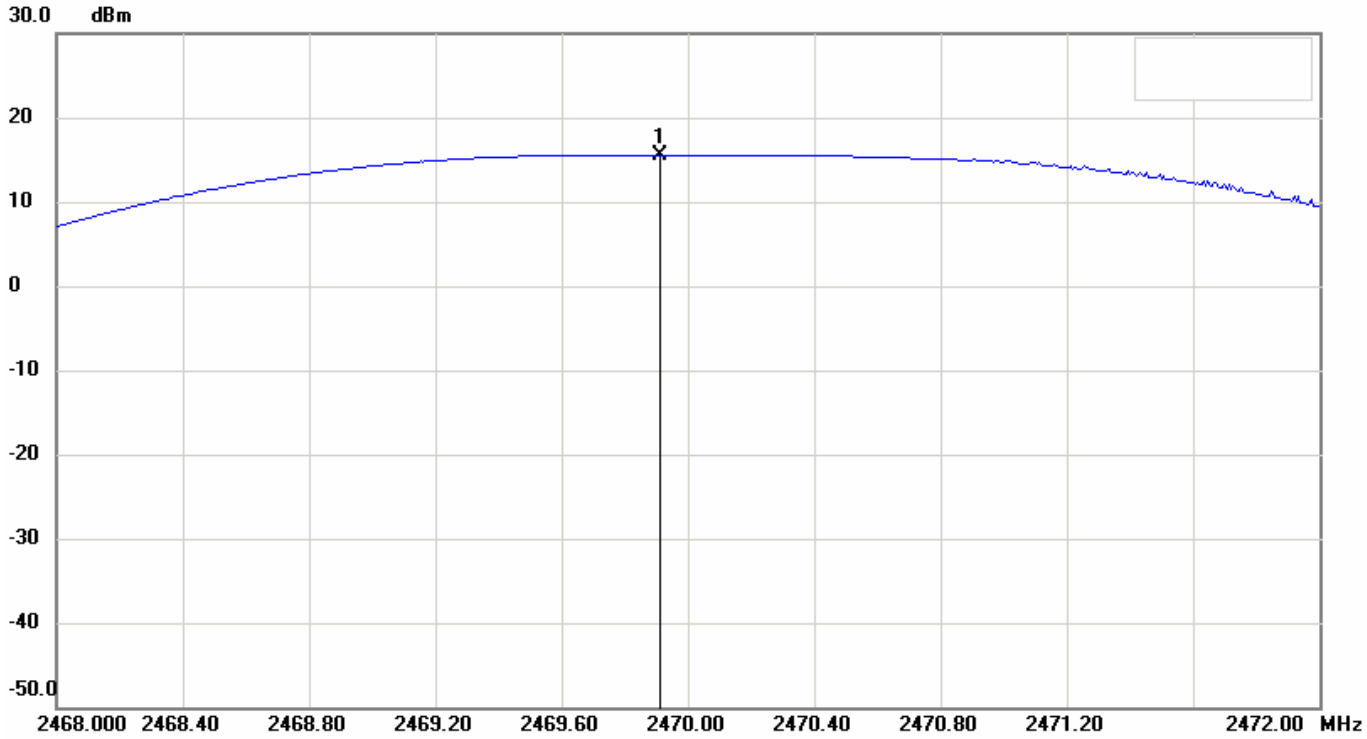
Test Mode: **FCC CHM Output Power**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2439.9533	16.17

File: **24TR 1119** **Data:** **#56** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **PM 02:46:10** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 1000 KHz** **VBW: 3000 KHz**

Test Mode: **FCC CHH Output Power**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2469.9133	15.52

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 3. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

9.4 Measurement Data

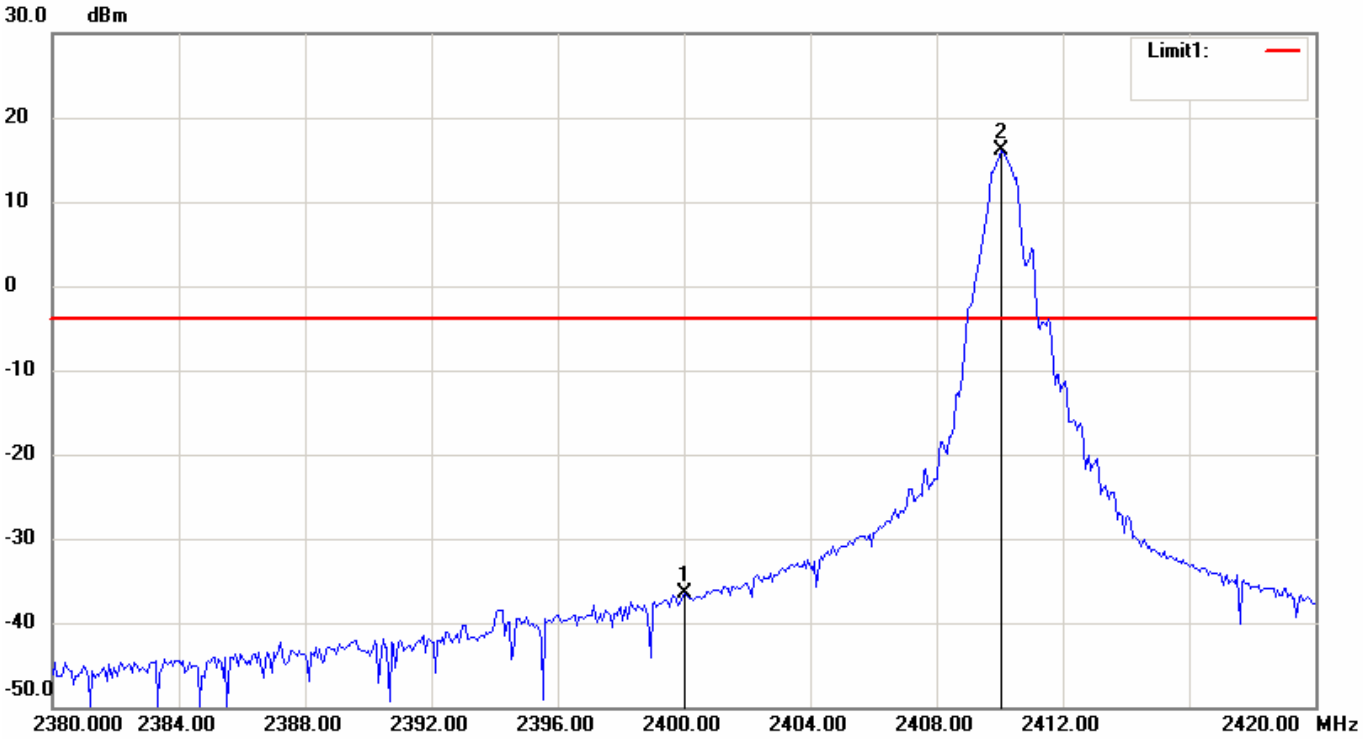
Test Date : Dec. 21, 2009 Temperature : 18℃ Humidity : 51%

Channel	Test Frequency Range	Note	Chart
20	2350 MHz - 2450 MHz	Lower Band Edge	Page 34
140	2433.5 MHz - 2533.5 MHz	Upper Band Edge	Page 35
20	30 MHz - 25 GHz		Page 36
80	30 MHz - 25 GHz		Page 37
140	30 MHz - 25 GHz		Page 38

Note: Please refer to page 34 to page 38 for chart.

File: **24TR 1119** **Data:** **#158** **Date:** **2009/12/21** **Temperature:** **18 ℃**

Time: **PM 04:19:39** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1.12ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 100 KHz** **VBW: 300 KHz**

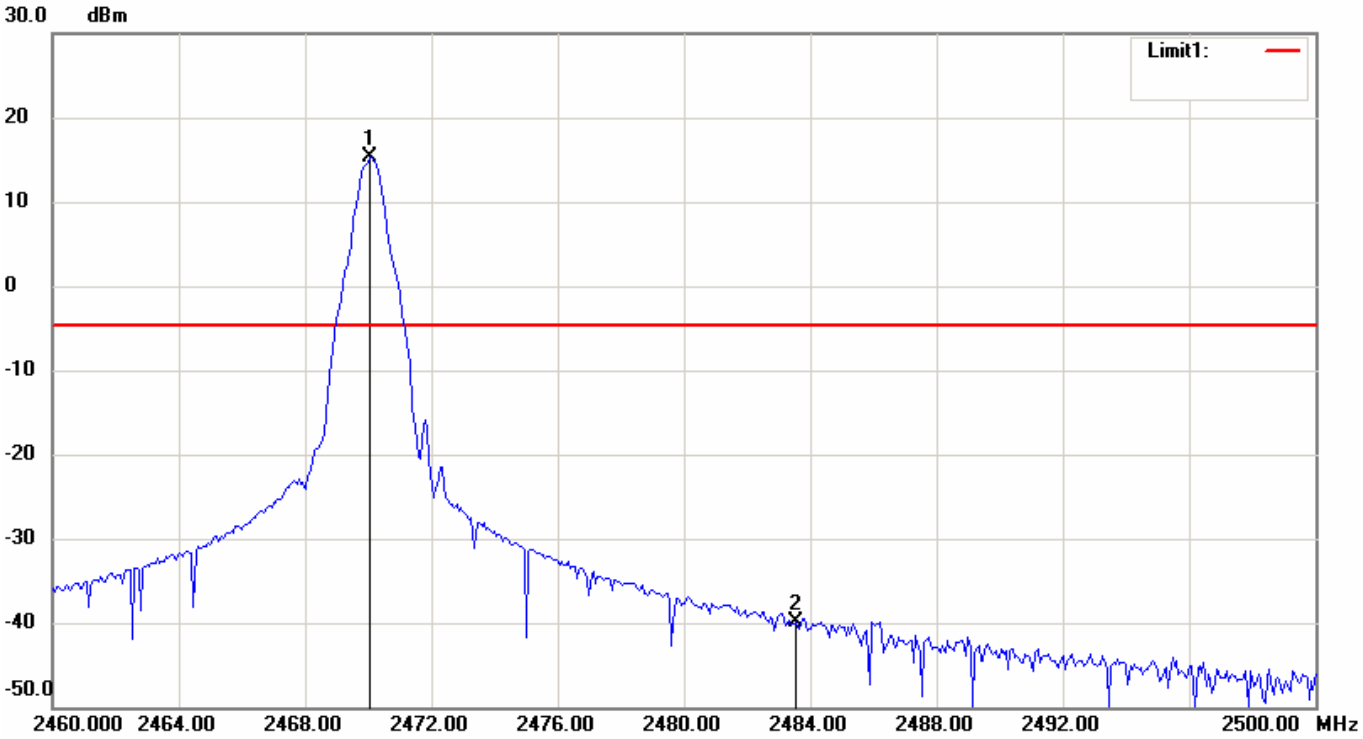
Test Mode: **FCC- ChanneL-Bandedge (Fixed)**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2400.0000	-36.58
2	2410.0667	16.09

File: 24TR 1119 **Data:** #63 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: PM 02:54:25 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **Sweep Time: 2.12ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 100 KHz** **VBW: 300 KHz**

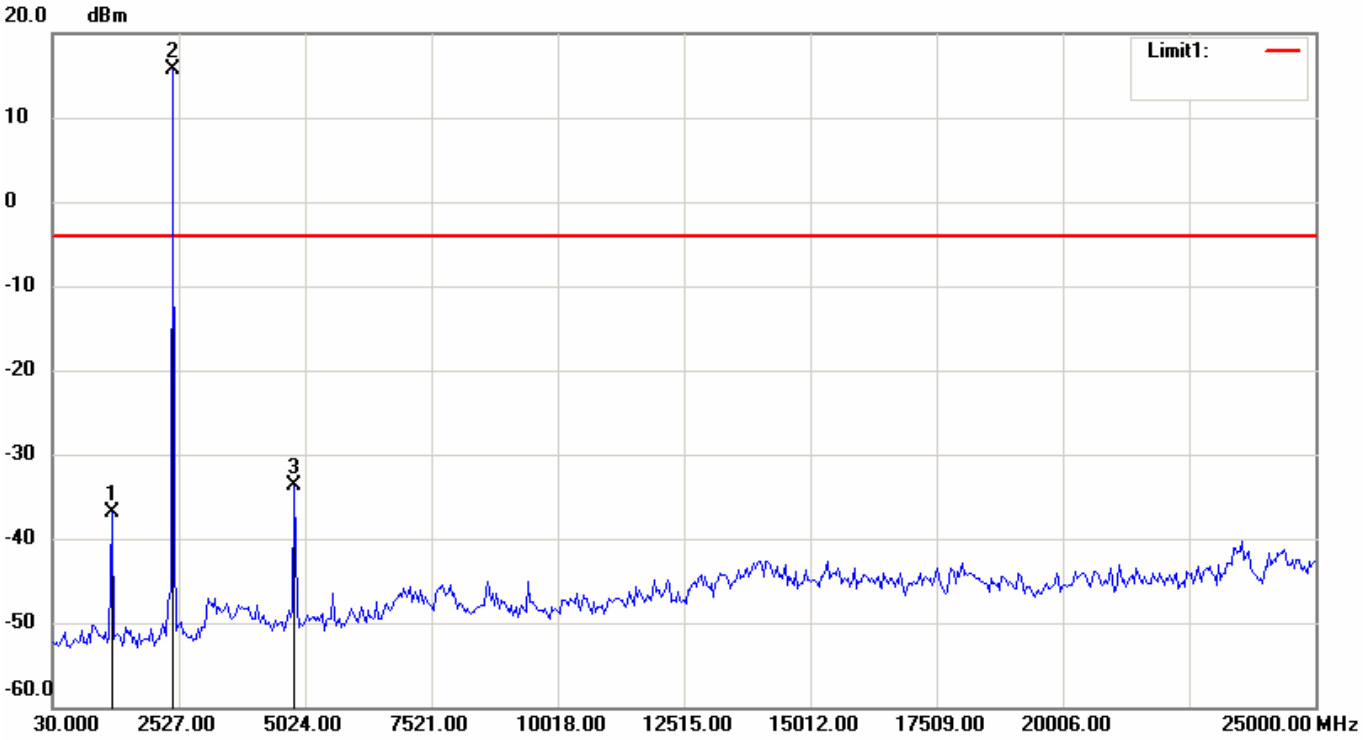
Test Mode: **FCC- Channel H-Bandedge (Fixed)**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2470.0667	15.37
2	2483.5000	-39.92

File: 24TR 1119 **Data:** #196 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: AM 11:55:36 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **T** **Sweep Time: 2386.4ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 100 KHz** **VBW: 300 KHz**

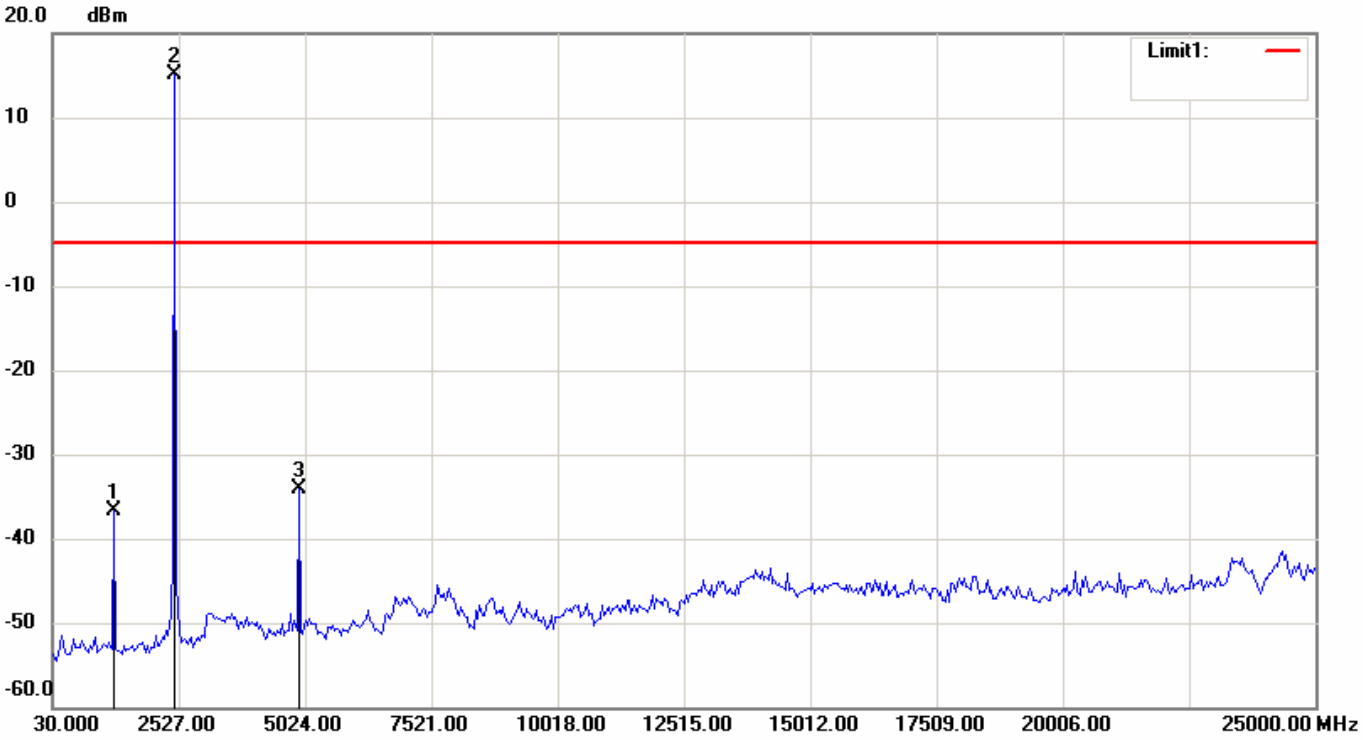
Test Mode: **FCC- Channel L-Conducted Spurious**

Note:

No.	Frequency(MHz)	Level(dBm)
1	1195.2665	-36.81
2	2402.1500	15.80
3	4815.9166	-33.73

File: 24TR 1119 **Data:** #198 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: PM 03:08:48 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **T** **Sweep Time: 2386.4ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 100 KHz** **VBW: 300 KHz**

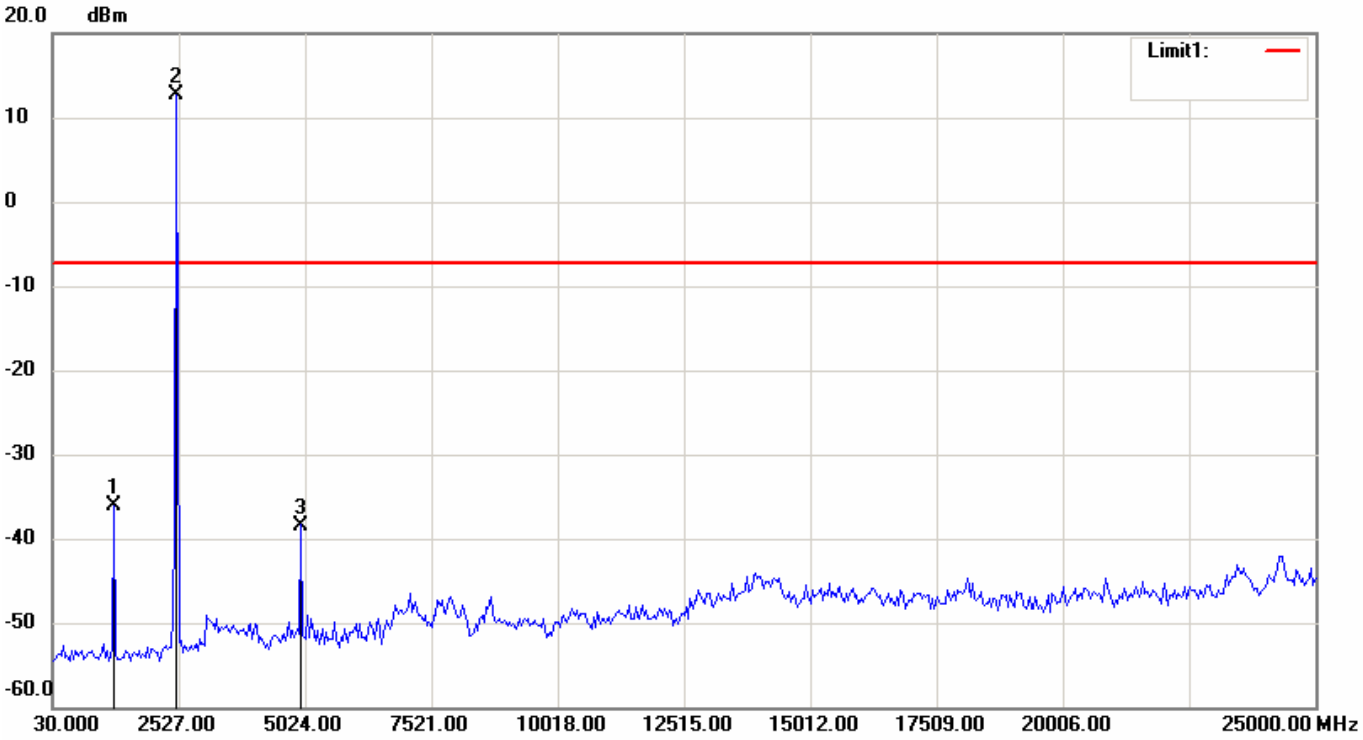
Test Mode: **FCC- Channel M-Conducted Spurious**

Note:

No.	Frequency(MHz)	Level(dBm)
1	1236.8833	-36.79
2	2443.7667	15.03
3	4899.1500	-34.10

File: 24TR 1119 **Data:** #199 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: PM 03:02:26 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **T** **Sweep Time: 2386.4ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode: **FCC- Channel H-Conducted Spurious**

Note:

No.	Frequency(MHz)	Level(dBm)
1	1236.8833	-36.02
2	2485.3833	12.76
3	4940.7667	-38.40

10 NUMBER of HOPPING CHANNELS

10.1 Standard Applicable

According to 15.247(a)(1)(iii), for frequency hopping systems, operating in the 2400-2483.5MHz band employing at least 15 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 3. 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	Agilent	E4446A	09/27/2010

10.4 Measurement Data

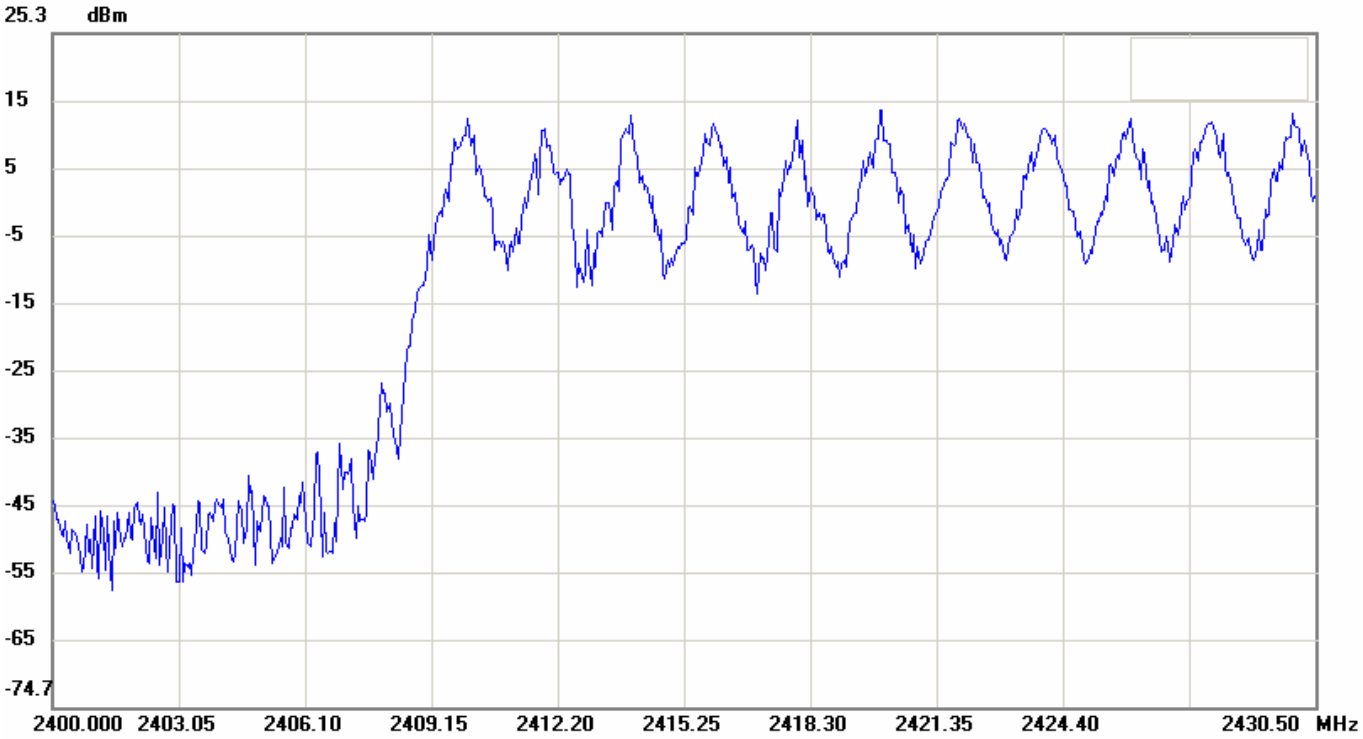
Test Date : Dec. 30, 2009 Temperature : 18℃ Humidity : 51%

Number of hopping channels = 31 channels

Note: Please refer to page 40 to page 42 for chart.

File: 24TR 1119 **Data: #184** **Date: 2009/12/30** **Temperature: 18 ℃**

Time: PM 01:35:06 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 26.36ms Att.: 30dB**

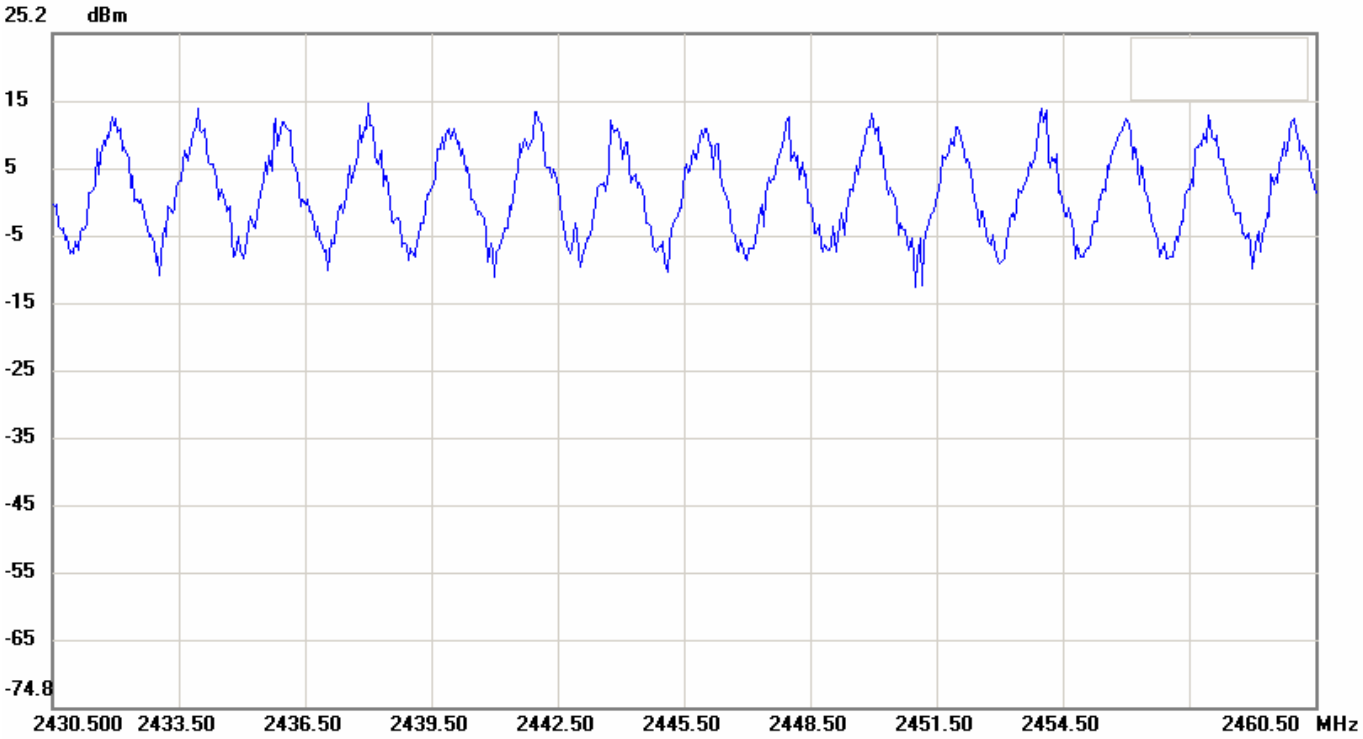
Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC-Number of Hopping Channels –Part1**

Note:

File: 24TR 1119 **Data: #183** **Date: 2009/12/30** **Temperature: 18 ℃**

Time: PM 01:32:42 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 26.36ms Att.: 30dB**

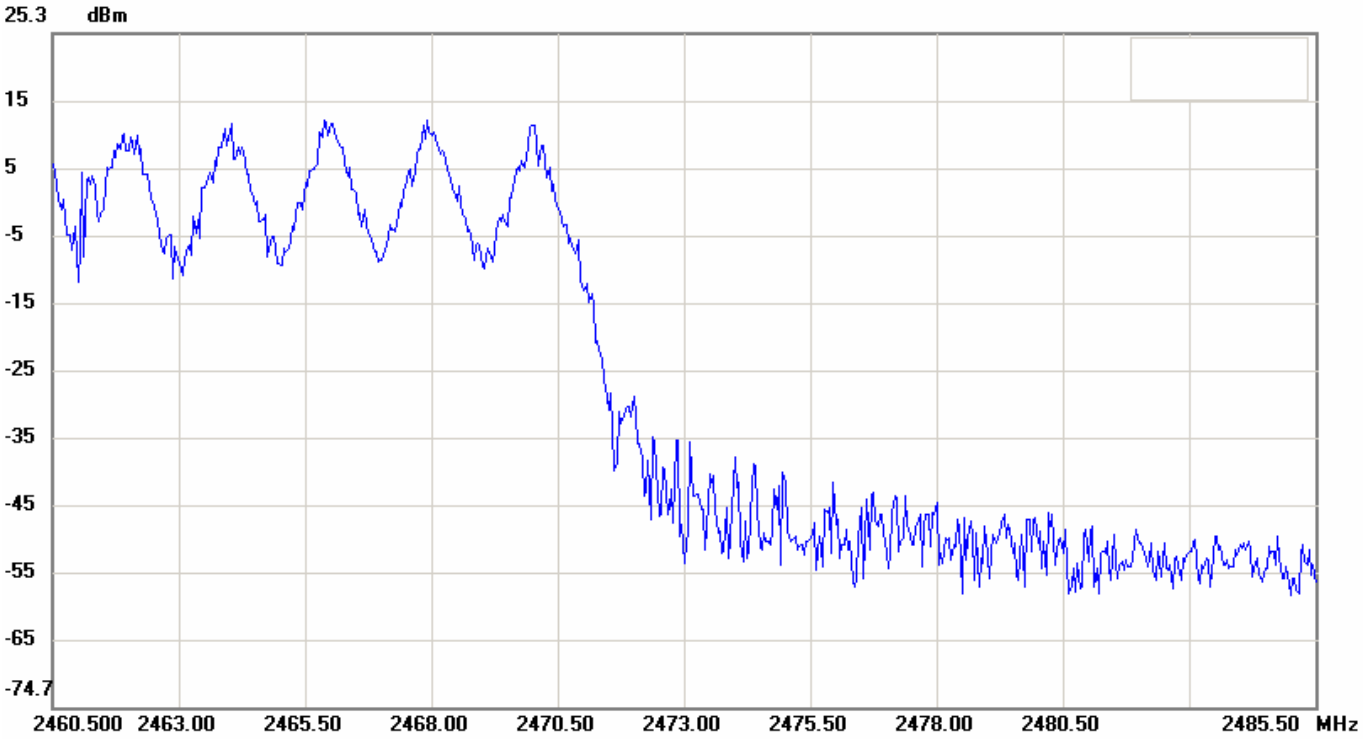
Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC-Number of Hopping Channels –Part2**

Note:

File: 24TR 1119 **Data: #181** **Date: 2009/12/30** **Temperature: 18 ℃**

Time: PM 01:26:38 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 26.36ms Att.: 30dB**

Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC-Number of Hopping Channels -Part3**

Note:

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 3. 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	Agilent	E4446A	09/27/2010

11.4 Measurement Data

Test Date : Dec. 21, 2009 Temperature : 18℃ Humidity : 51%

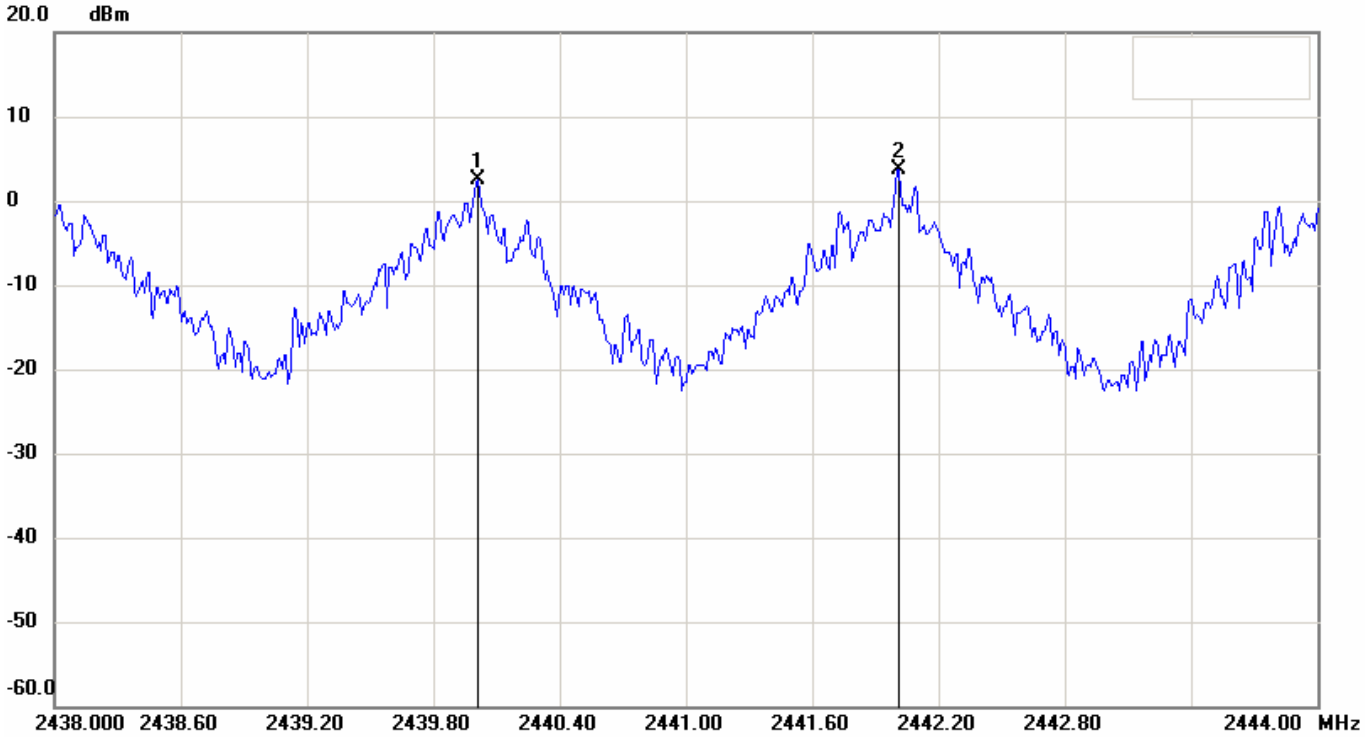
Channel	Frequency (MHz)	Hopping Channel Carrier Frequency Separated (MHz)	Chart
80	2440	2.000	Page 45

Note: 1. Please refer to page 45 for chart.

2. CH Low, CH Mid and CH High have the same test result. Only Mid test result showed in the test report.

File: 24TR 1119 **Data:** #209 **Date:** 2009/12/30 **Temperature:** 18 ℃

Time: AM 09:42:28 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **T** **Sweep Time: 6.36ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 30 KHz** **VBW: 100 KHz**

Test Mode: **FCC-Carrier Frequency Separation**

Note:

No.	Frequency(MHz)	Level(dBm)
1	2440.0100	2.55
2	2442.0100	3.61

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	2.00	1.06

12 Dwell Time

12.1 Standard Applicable

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

12.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. The setup of the EUT as shown in figure 3.

12.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

12.4 Measurement Data

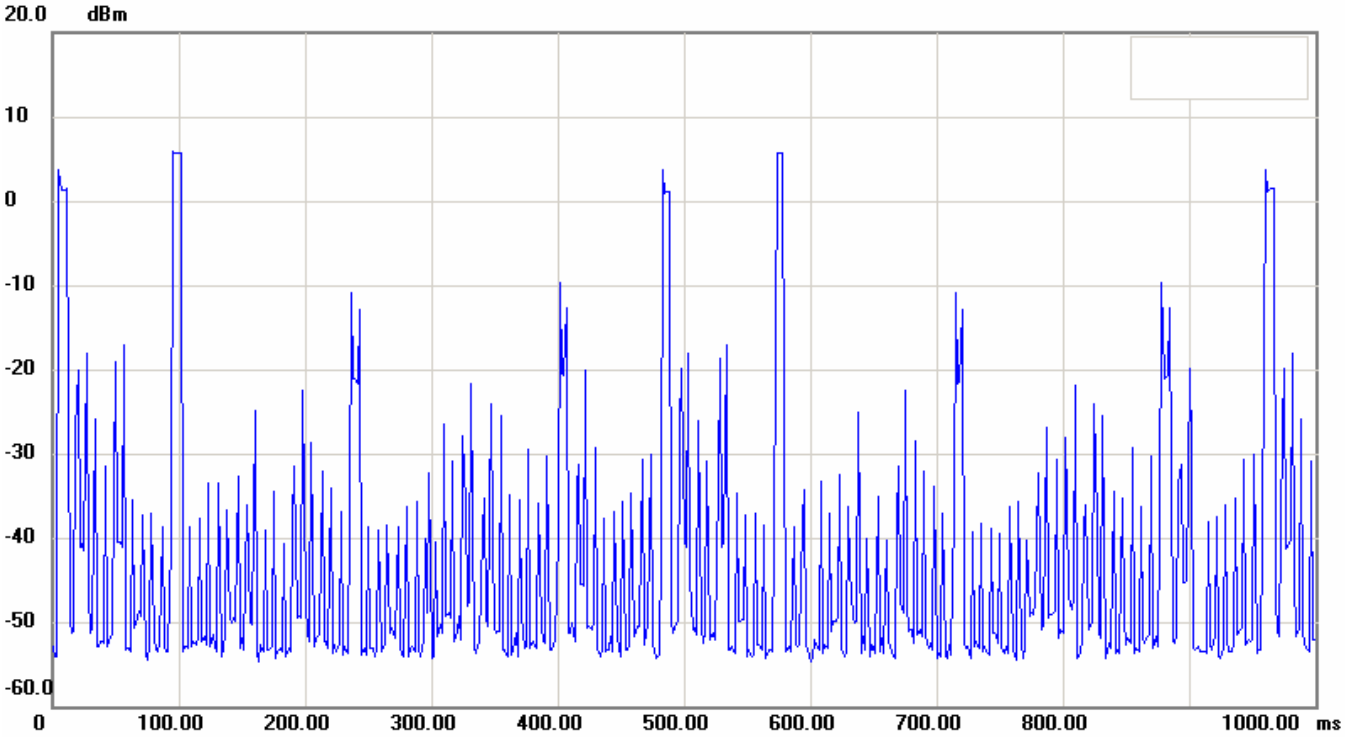
Test Date : Nov. 19, 2009 Temperature : 26℃ Humidity : 51%

Test period=0.4 (second/channel)×31 channel=12.4sec
Dwell time= 6.033 ms×26 = 156.9 ms

Note: Please refer to page 47 to page 50 for chart.

File: 24TR 1119 **Data:** #227 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: AM 11:15:14 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **Sweep Time: 1000ms** **Att.: 30dB**

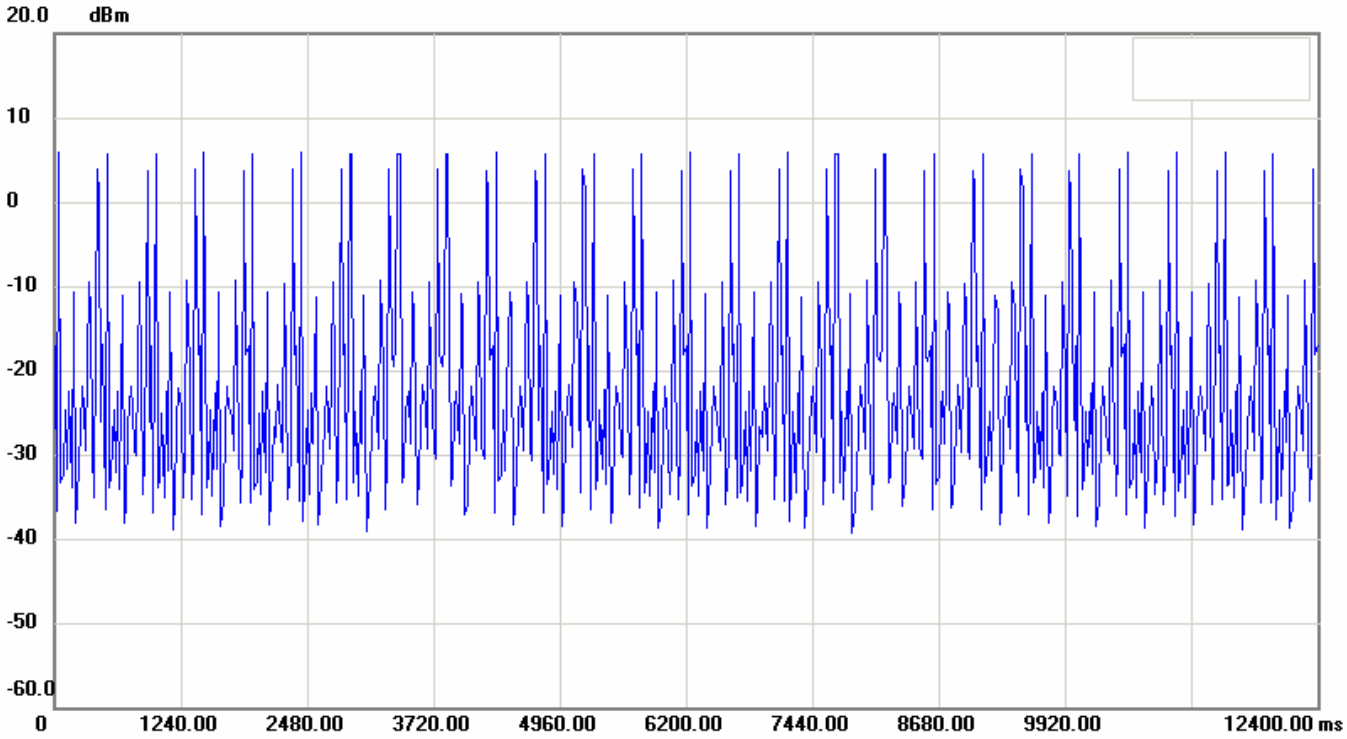
Model: **VD-8810C** **RBW: 1000 KHz** **VBW: 1000 KHz**

Test Mode: **Hops per 12.4 seconds - 1**

Note:

File: **24TR 1119** **Data:** **#231** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **AM 11:30:07** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 12400ms** **Att.: 30dB**

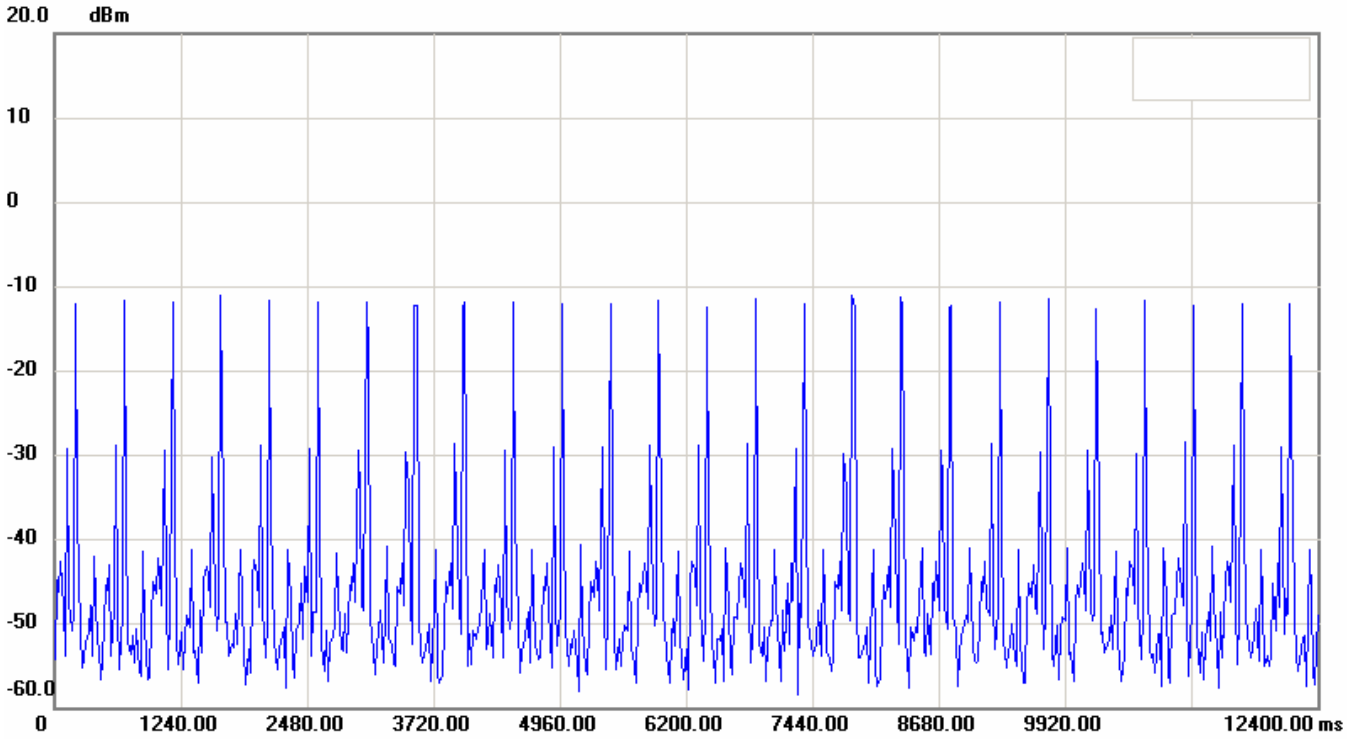
Model: **VD-8810C** **RBW: 1000 KHz** **VBW: 1000 KHz**

Test Mode: **Hops per 12.4 seconds - 2**

Note:

File: 24TR 1119 **Data:** #233 **Date:** 2009/11/19 **Temperature:** 26 ℃

Time: AM 11:33:17 **Humidity:** 51 %



Condition: **RF Conducted**

EUT: **Sweep Time: 12400ms Att.: 30dB**

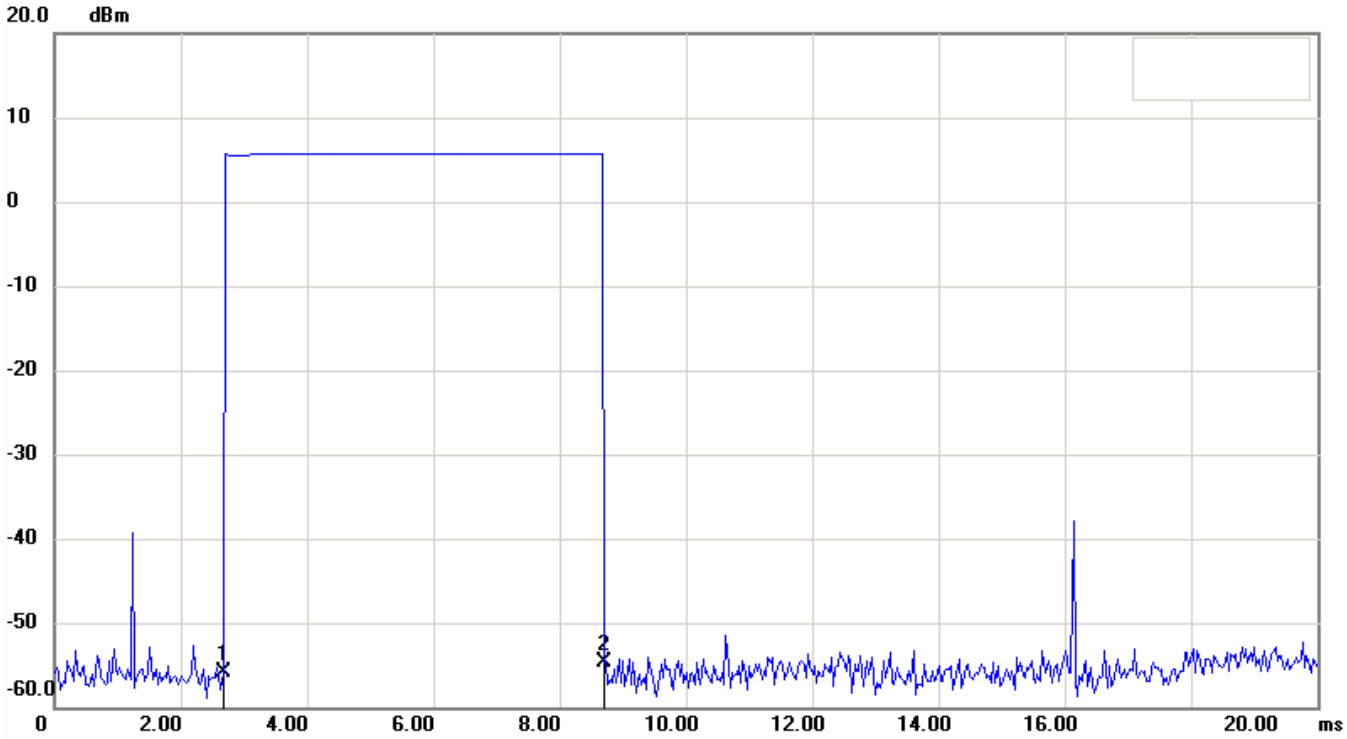
Model: **VD-8810C** **RBW: 100 KHz VBW: 100 KHz**

Test Mode: **Hops per 12.4 seconds – 3**

Note:

File: **24TR 1119** **Data:** **#229** **Date:** **2009/11/19** **Temperature:** **26 ℃**

Time: **AM 11:26:08** **Humidity:** **51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 20ms** **Att.: 30dB**

Model: **VD-8810C** **RBW: 1000 KHz** **VBW: 1000 KHz**

Test Mode: **DT pusle width**

Note:

No.	Sweep time(ms)	Level(dBm)
1	2.6667	-55.82
2	8.7000	-54.75

No.		△Time(ms)	△Level(dB)
1	Mk2-mk1	6.0333	1.07