

# FC

## Test Report

Product Name	Dongle
Model No	JS-006R
FCC ID.	YKAJS-006R

Applicant	BYD PRECISION MFR CO LTD
Address	No.1.Baoping Road, Baolong Industrial Park,Longgang Shenzhen,518116, P.R.China

Date of Receipt	June 29, 2010
Issue Date	July 12, 2010
Report No.	107031R-RFUSP42V01
Report Version	V1.0

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of Quietek Corporation.

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

# Test Report Certification



Issue Date: July 12, 2010

Report No.: 107031R-RFUSP42V01



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0


Product Name	Dongle
Applicant	BYD PRECISION MFR CO LTD
Address	No.1.Baoping Road, Baolong Industrial Park,Longgang Shenzhen,518116, P.R.China
Manufacturer	BYD PRECISION MFR CO LTD
Model No.	JS-006R
EUT Rated Voltage	DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2009 ANSI C63.4: 2003
	 NVLAP Lab Code: 200533-0
Test Result	Complied

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Tested By :   
( Engineer / Joe Guo )

Approved By :   
( Manager / Vincent Lin )




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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Dongle
Trade Name	
Model No.	JS-006R
FCC ID.	YKAJS-006R
Frequency Range	2405-2476MHz
Number of Channels	64CH
Channel Separation	1MHz
Type of Modulation	GFSK
Antenna Type	Printed on PCB
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	BYD PRECISION MFR CO LTD	N/A	-4.51dBi for 2.4GHz

Note: The antenna of EUT is conform to FCC 15.203

## Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2405MHz	Channel 23:	2429MHz	Channel 45:	2457MHz
Channel 2:	2406MHz	Channel 24:	2430MHz	Channel 46:	2458MHz
Channel 3:	2407MHz	Channel 25:	2431MHz	Channel 47:	2459MHz
Channel 4:	2408MHz	Channel 26:	2432MHz	Channel 48:	2460MHz
Channel 5:	2409MHz	Channel 27:	2434MHz	Channel 49:	2461MHz
Channel 6:	2410MHz	Channel 28:	2435MHz	Channel 50:	2462MHz
Channel 7:	2411MHz	Channel 29:	2436MHz	Channel 51:	2463MHz
Channel 8:	2412MHz	Channel 30:	2437MHz	Channel 52:	2464MHz
Channel 9:	2413MHz	Channel 31:	2438MHz	Channel 53:	2465MHz
Channel 10:	2414MHz	Channel 32:	2439MHz	Channel 54:	2466MHz
Channel 11:	2415MHz	Channel 33:	2442MHz	Channel 55:	2467MHz
Channel 12:	2416MHz	Channel 34:	2443MHz	Channel 56:	2468MHz
Channel 13:	2417MHz	Channel 35:	2444MHz	Channel 57:	2469MHz
Channel 14:	2418MHz	Channel 36:	2446MHz	Channel 58:	2470MHz
Channel 15:	2419MHz	Channel 37:	2447MHz	Channel 59:	2471MHz
Channel 16:	2420MHz	Channel 38:	2448MHz	Channel 60:	2472MHz
Channel 17:	2421MHz	Channel 39:	2449MHz	Channel 61:	2473MHz
Channel 18:	2422MHz	Channel 40:	2451MHz	Channel 62:	2474MHz
Channel 19:	2423MHz	Channel 41:	2452MHz	Channel 63:	2475MHz
Channel 20:	2425MHz	Channel 42:	2453MHz	Channel 64:	2476MHz
Channel 21:	2427MHz	Channel 43:	2455MHz		
Channel 22:	2428MHz	Channel 44:	2456MHz		

## Note:

1. The EUT is a Dongle.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

## 1.2. Operational Description

The EUT is a Dongle, The Number of the channels is 64 in 2405~2476MHz. The device operation in 2.4GHz modulation is GFSK. The Antenna is Printed on PCB.

Test Mode:	Mode 1: Transmit
------------	------------------

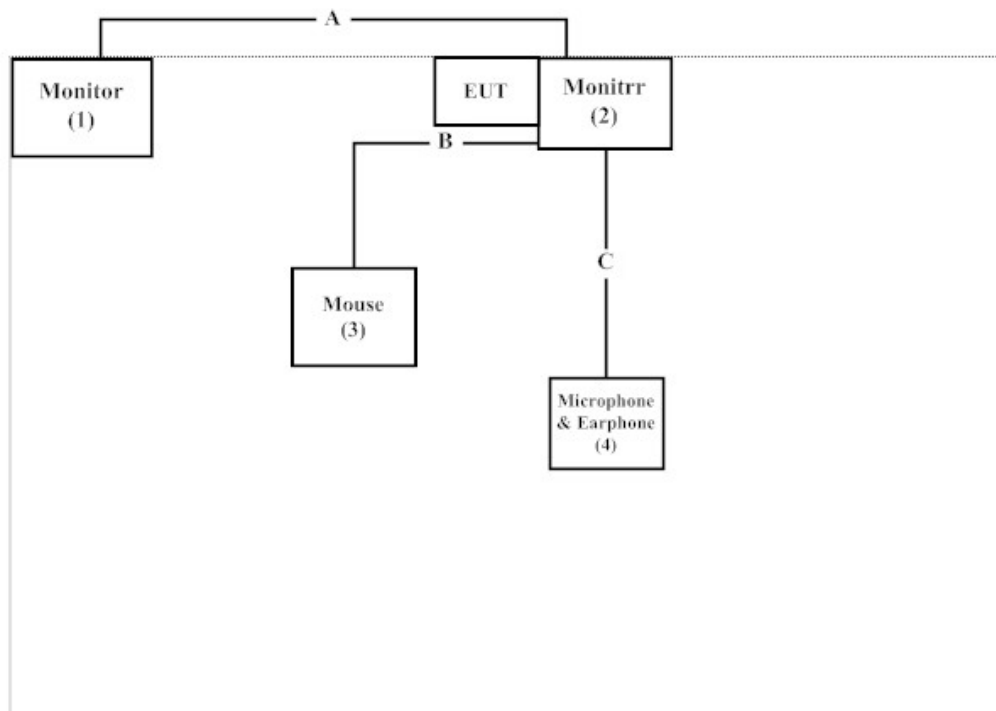
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Monitor	LG	W2261VT	907YHED07299	Non-Shielded, 1.8m
(2)	Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
(3)	Mouse	Logitech	M-SBM96B	810-000439	N/A
(4)	Microphone & Earphone	PCHOME	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A. VGA Cable	Non-Shielded, 1.8m
B. Mouse Cable	Non-Shielded, 1.8m
C. Microphone & Earphone Cable	Non-Shielded, 1.5m

### 1.4. Configuration of Tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Provide the DC Power Source.
- (3) Start transmits continually.
- (4) Verify that the EUT works properly.



## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://tw.quietek.com/tw/emc/accreditations/accreditations.htm>  
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on

Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
Registration Number: 92195



Accreditation on NVLAP  
NVLAP Lab Code: 200533-0



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FCC Accreditation Number: TW1014



## 2. Conducted Emission

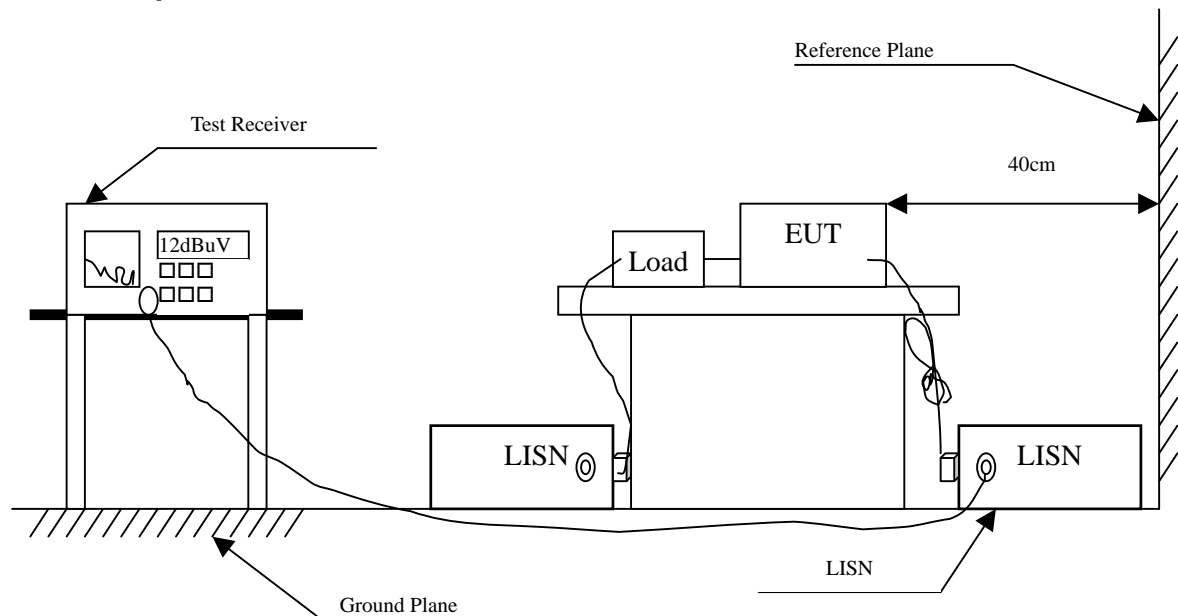
### 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2010	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2010	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2010	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2010	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

### 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.) Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : Dongle  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.177	9.730	38.560	48.289	-16.940	65.229
0.291	9.653	30.300	39.953	-22.018	61.971
0.423	9.642	17.140	26.782	-31.418	58.200
1.271	9.670	15.680	25.350	-30.650	56.000
4.849	9.700	20.000	29.700	-26.300	56.000
16.361	9.990	21.800	31.790	-28.210	60.000
<b>Average</b>					
0.177	9.730	23.550	33.279	-21.950	55.229
0.291	9.653	14.770	24.423	-27.548	51.971
0.423	9.642	5.130	14.772	-33.428	48.200
1.271	9.670	5.410	15.080	-30.920	46.000
4.849	9.700	6.930	16.630	-29.370	46.000
16.361	9.990	15.890	25.880	-24.120	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Dongle  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmit

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.158	9.756	39.660	49.416	-16.355	65.771
0.189	9.724	35.380	45.104	-19.782	64.886
0.291	9.663	29.730	39.393	-22.578	61.971
1.334	9.670	12.350	22.020	-33.980	56.000
4.713	9.700	19.700	29.400	-26.600	56.000
15.088	10.000	14.540	24.540	-35.460	60.000
<b>Average</b>					
0.158	9.756	32.040	41.796	-13.975	55.771
0.189	9.724	16.360	26.084	-28.802	54.886
0.291	9.663	22.490	32.153	-19.818	51.971
1.334	9.670	6.300	15.970	-30.030	46.000
4.713	9.700	7.800	17.500	-28.500	46.000
15.088	10.000	9.390	19.390	-30.610	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Peak Power Output

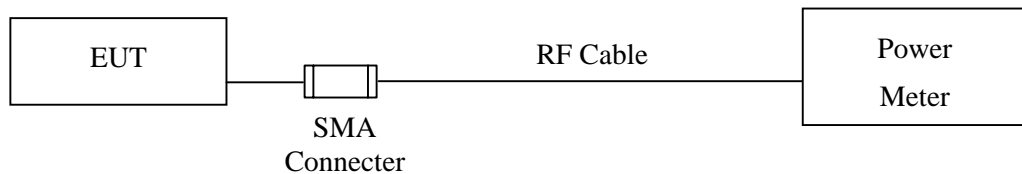
#### 3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2010
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2010

Note: 1. All instruments are calibrated every one year.  
2. The test instruments marked by "X" are used to measure the final test results.

#### 3.2. Test Setup

Conducted Measurement



#### 3.3. Limits

The maximum peak power shall be less 1 Watt.

#### 3.4. Test Procedure

The EUT was tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

#### 3.5. Uncertainty

$\pm 1.27$  dB

### 3.6. Test Result of Peak Power Output

Product : Dongle  
Test Item : Peak Power Output Data  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
01	2405.00	-4.12	<30dBm	Pass
32	2439.00	-3.03	<30dBm	Pass
64	2476.00	-2.14	<30dBm	Pass

Note: Peak Power Output Value = Reading value on peak power meter + cable loss

#### 4. Radiated Emission

##### 4.1. Test Equipment

The following test equipment are used during the radiated emission test:

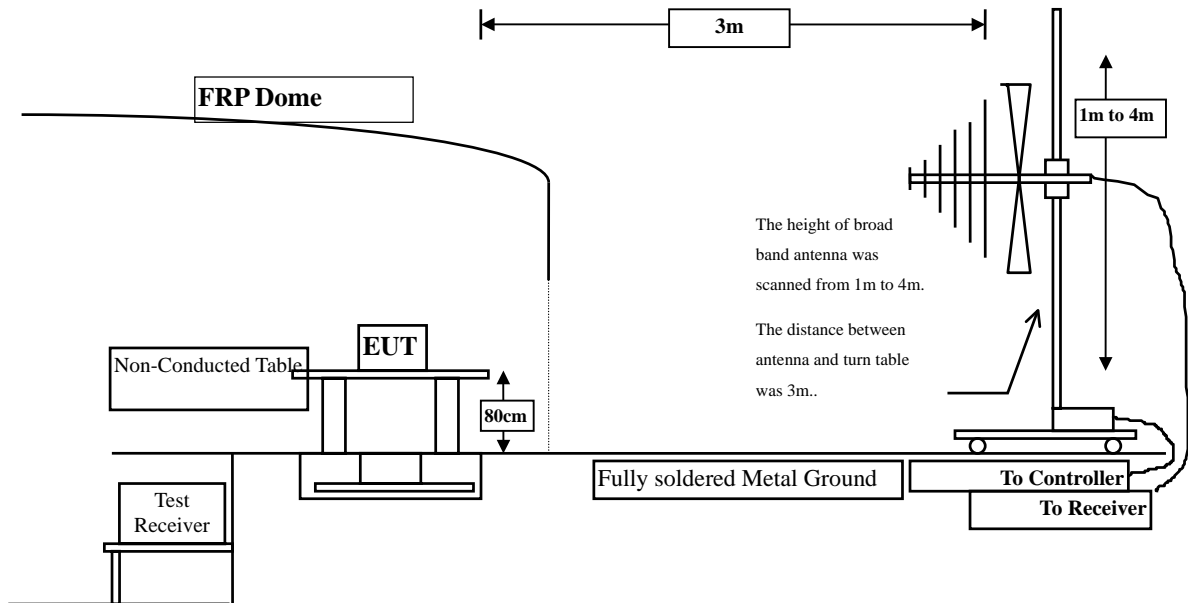
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2009
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2010
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

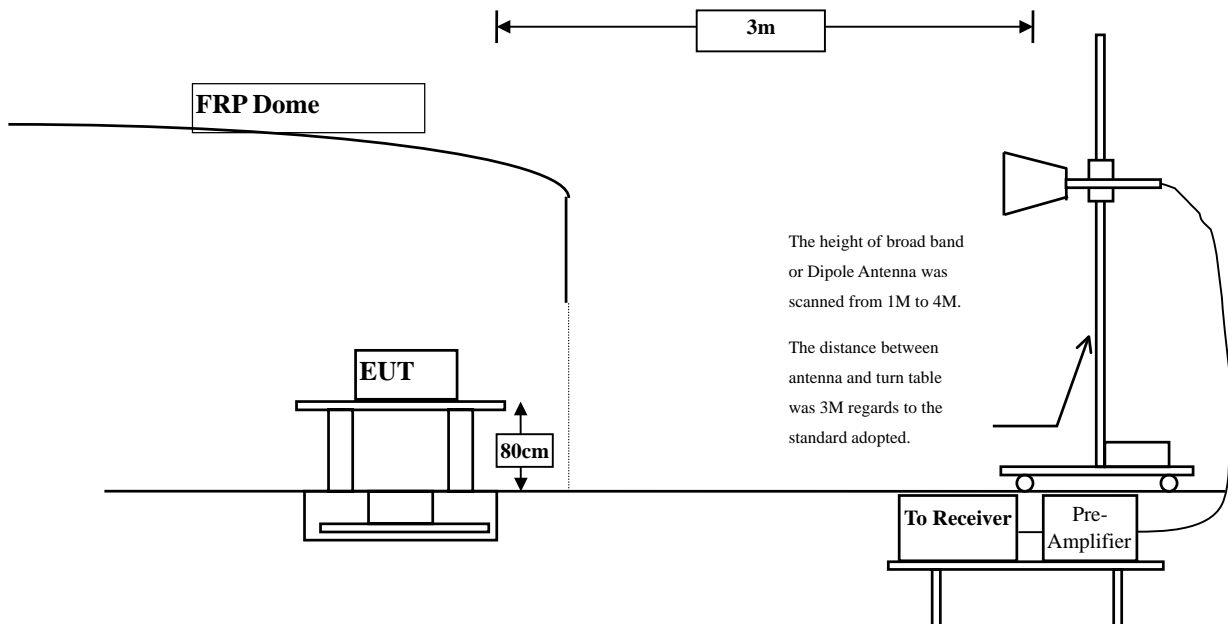


## 4.2. Test Setup

### Radiated Emission Below 1GHz



### Radiated Emission Above 1GHz



#### 4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

<b>FCC Part 15 Subpart C Paragraph 15.209(a) Limits</b>		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

#### 4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

#### 4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

#### 4.6. Test Result of Radiated Emission

Product : Dongle  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4810.000	3.323	44.040	47.363	-26.637	74.000
7215.000	10.289	36.340	46.630	-27.370	74.000
9620.000	13.595	35.720	49.316	-24.684	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4810.000	6.591	45.610	52.201	-21.799	74.000
7215.000	11.151	36.710	47.862	-26.138	74.000
9620.000	14.014	35.550	49.565	-24.435	74.000

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Dongle  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2439MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4878.000	3.019	46.350	49.369	-24.631	74.000
7317.000	12.678	36.450	49.129	-24.871	74.000
9756.000	13.077	36.630	49.707	-24.293	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4878.000	5.762	46.870	52.633	-21.367	74.000
7317.000	12.678	35.170	47.849	-26.151	74.000
9756.000	13.077	36.890	49.967	-24.033	74.000

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Dongle  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2476MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4952.000	2.783	48.330	51.113	-22.887	74.000
7428.000	12.453	34.880	47.333	-26.667	74.000
9904.000	13.358	36.440	49.798	-24.202	74.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
4952.000	5.550	47.620	53.170	-20.830	74.000
7428.000	13.409	34.700	48.109	-25.891	74.000
9904.000	13.944	36.240	50.184	-23.816	74.000

**Note:**

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Dongle  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2439MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
47.460	-9.151	32.715	23.565	-16.435	40.000
251.160	-5.745	42.264	36.519	-9.481	46.000
344.280	-2.591	32.105	29.515	-16.485	46.000
565.440	1.611	34.667	36.278	-9.722	46.000
650.800	2.175	33.363	35.538	-10.462	46.000
827.340	6.302	27.547	33.849	-12.151	46.000
<b>Vertical</b>					
136.700	-5.143	34.347	29.204	-14.296	43.500
256.980	-7.573	42.444	34.871	-11.129	46.000
344.280	-3.171	36.005	32.835	-13.165	46.000
499.480	-0.852	36.852	36.000	-10.000	46.000
565.440	-5.379	40.725	35.346	-10.654	46.000
965.080	7.932	31.340	39.272	-14.728	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

## 5. RF antenna conducted test

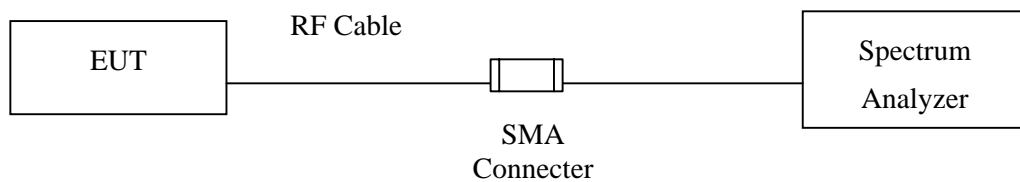
### 5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

### 5.2. Test Setup

#### RF antenna Conducted Measurement:



### 5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### **5.4. Test Procedure**

The EUT was tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

#### **5.5. Uncertainty**

The measurement uncertainty

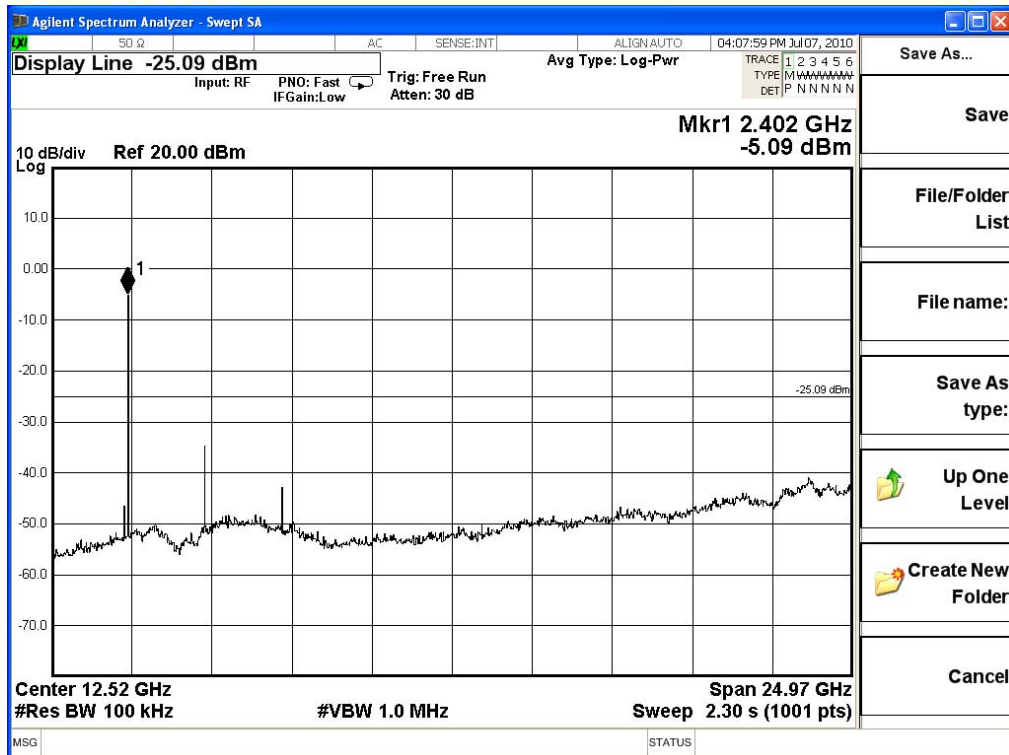
Conducted is defined as  $\pm 1.27\text{dB}$



## 5.6. Test Result of RF antenna conducted test

Product : Dongle  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

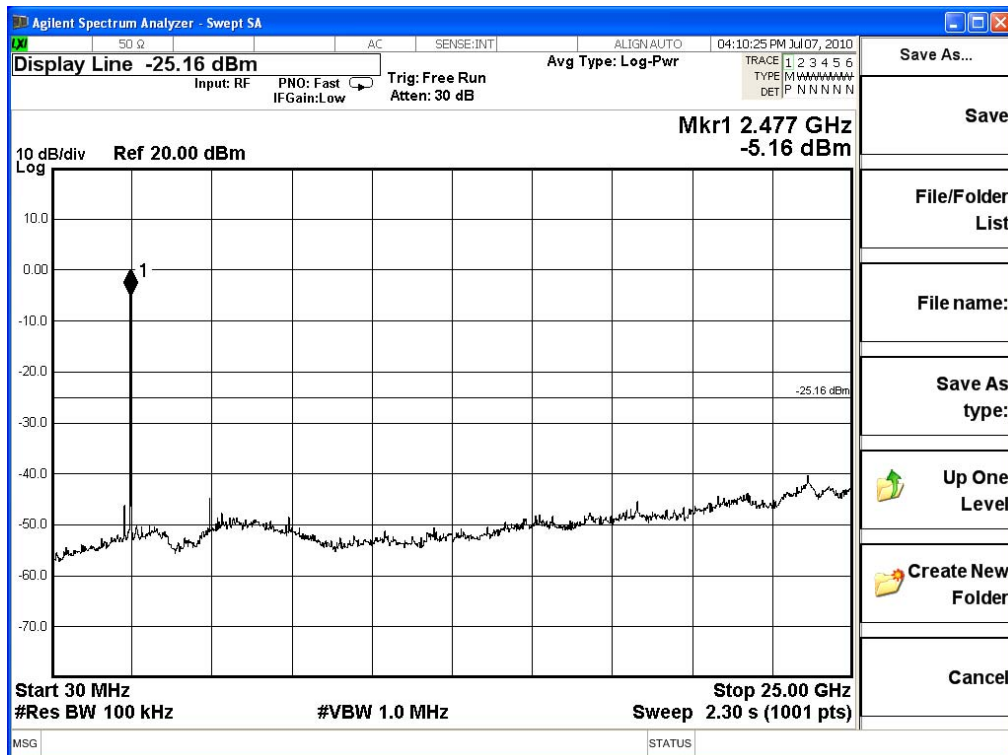
### Channel 01 (2405MHz) 30M-25GHz



### Channel 32 (2439MHz) 30M-25GHz



### Channel 64 (2476MHz) 30M-25GHz



## 6. Band Edge

### 6.1. Test Equipment

#### RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

#### RF Radiated Measurement:

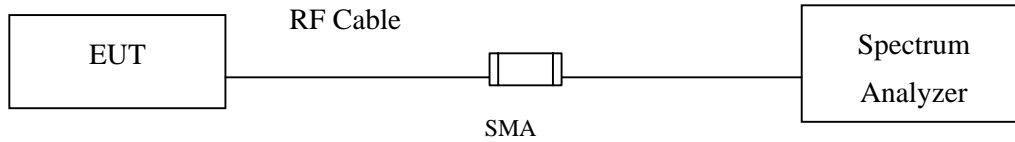
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2009
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2009
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2009
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2009
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2010
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

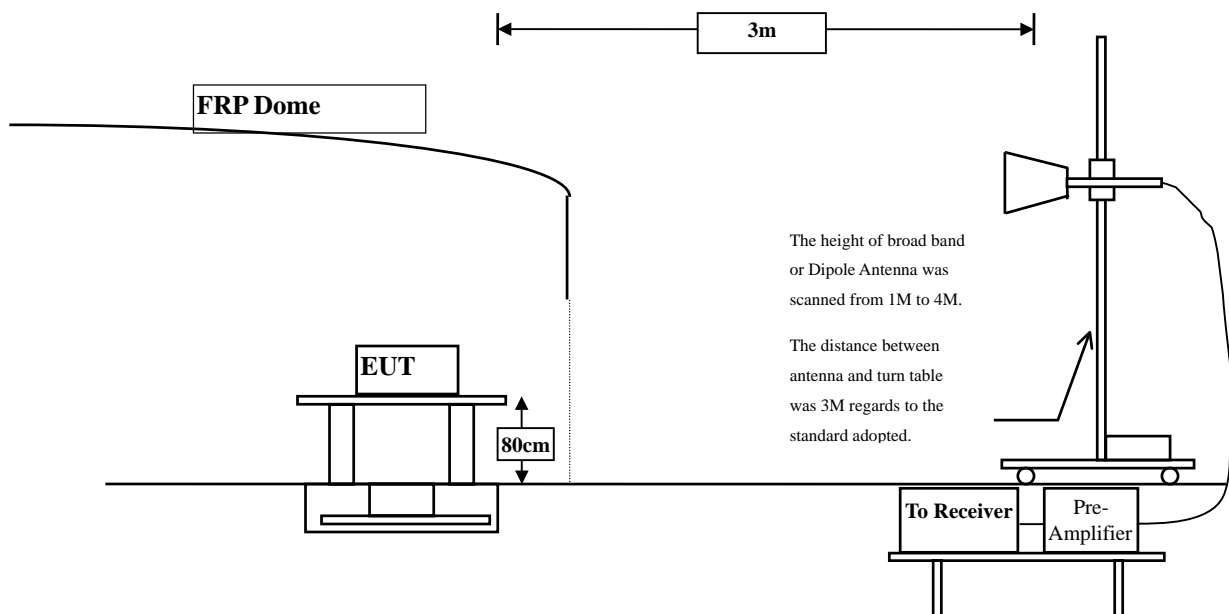
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by "X" are used to measure the final test results.

## 6.2. Test Setup

### RF Conducted Measurement



### RF Radiated Measurement:



## 6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

#### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

#### **6.5. Uncertainty**

± 3.9 dB above 1GHz  
± 3.8 dB below 1GHz

## 6.6. Test Result of Band Edge

Product : Dongle  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2405	31.593	50.32	81.913	Peak
Horizontal	2405	--	--	--	Average
Vertical	2405	30.926	55.45	86.376	Peak
Vertical	2405	--	--	--	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390	81.913	39.282	42.631	Peak
Horizontal	2390	--	--	--	Average
Vertical	2390	86.376	39.282	47.094	Peak
Vertical	2390	--	--	--	Average

Note:

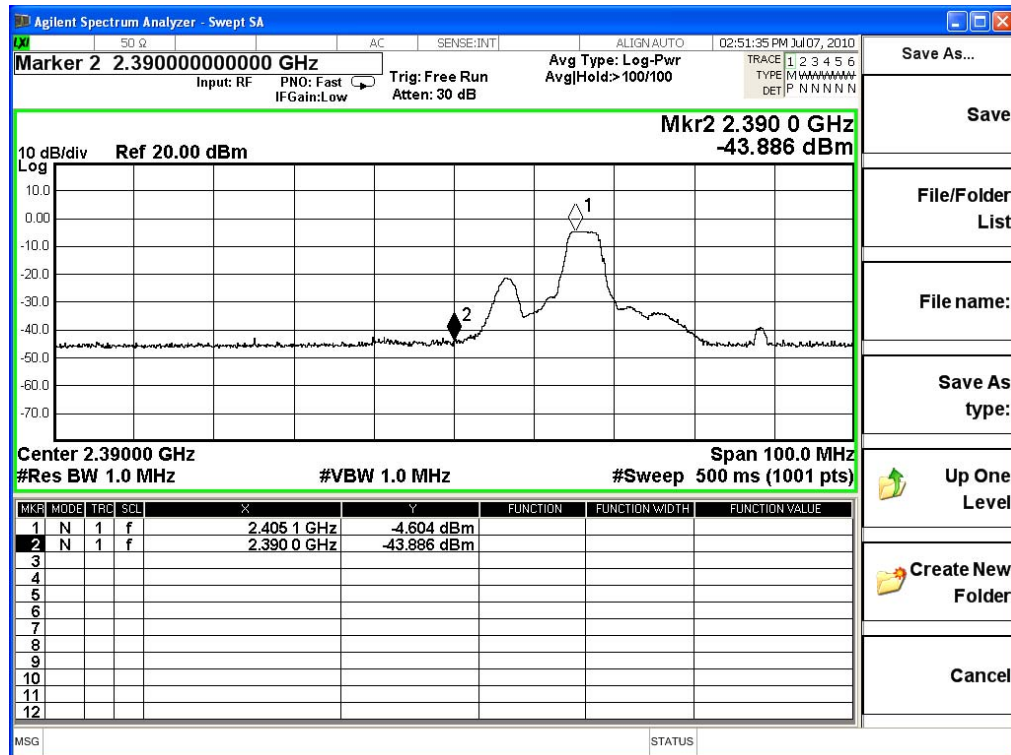
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength =  $F - \Delta$

F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



Product : Dongle  
Test Item : Band Edge Data  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2476	32.125	48.69	80.815	Peak
Horizontal	2476	--	--	--	Average
Vertical	2476	31.384	54.43	85.815	Peak
Vertical	2476	--	--	--	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	80.815	19.403	61.412	Peak
Horizontal	2483.5	--	--	--	Average
Vertical	2483.5	85.815	19.403	66.412	Peak
Vertical	2483.5	--	--	--	Average

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)



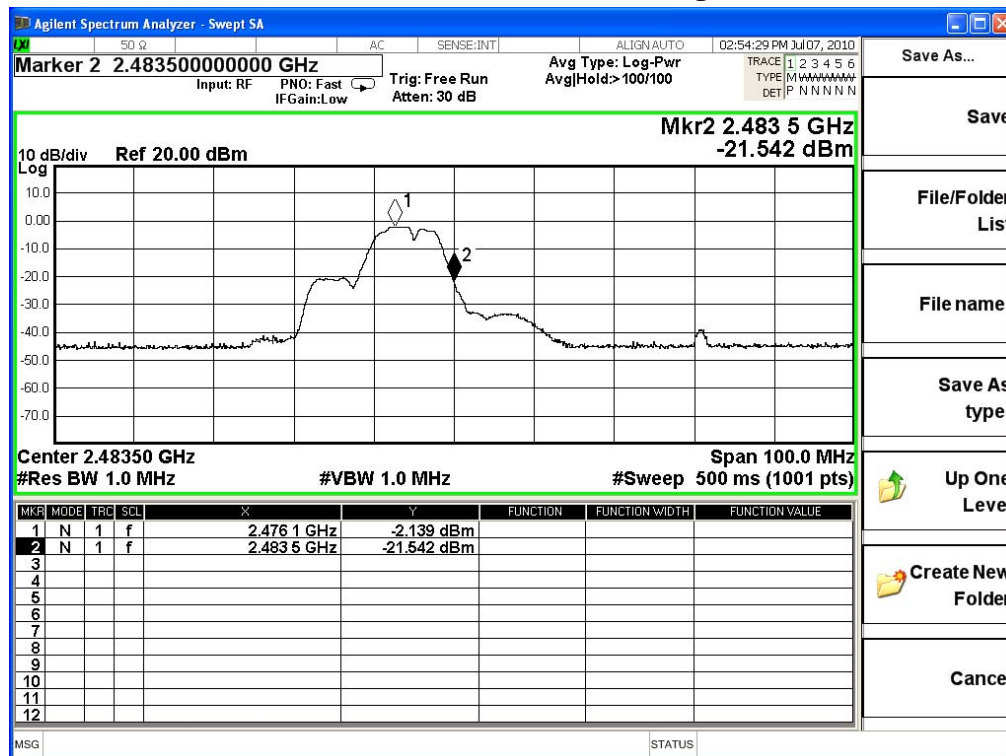
**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
2483.5	61.412	-20.000	41.412	-12.588	54.000
<b>Vertical</b>					
2483.5	66.412	-20.000	46.412	-7.588	54.000

Note:

1. AVG Measurement=Peak Measurement - Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 9.
3. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

**Peak Detector of conducted Band Edge Delta**



## 7. Occupied Bandwidth

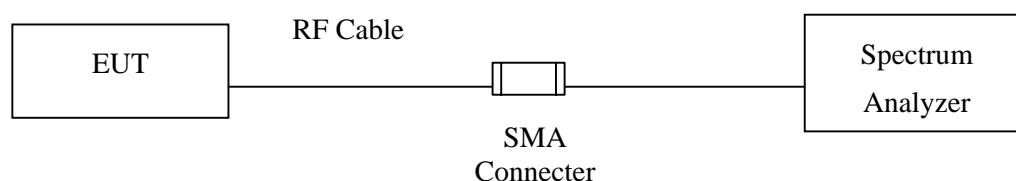
### 7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note: 1. All instruments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

### 7.2. Test Setup



### 7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

### 7.5. Uncertainty

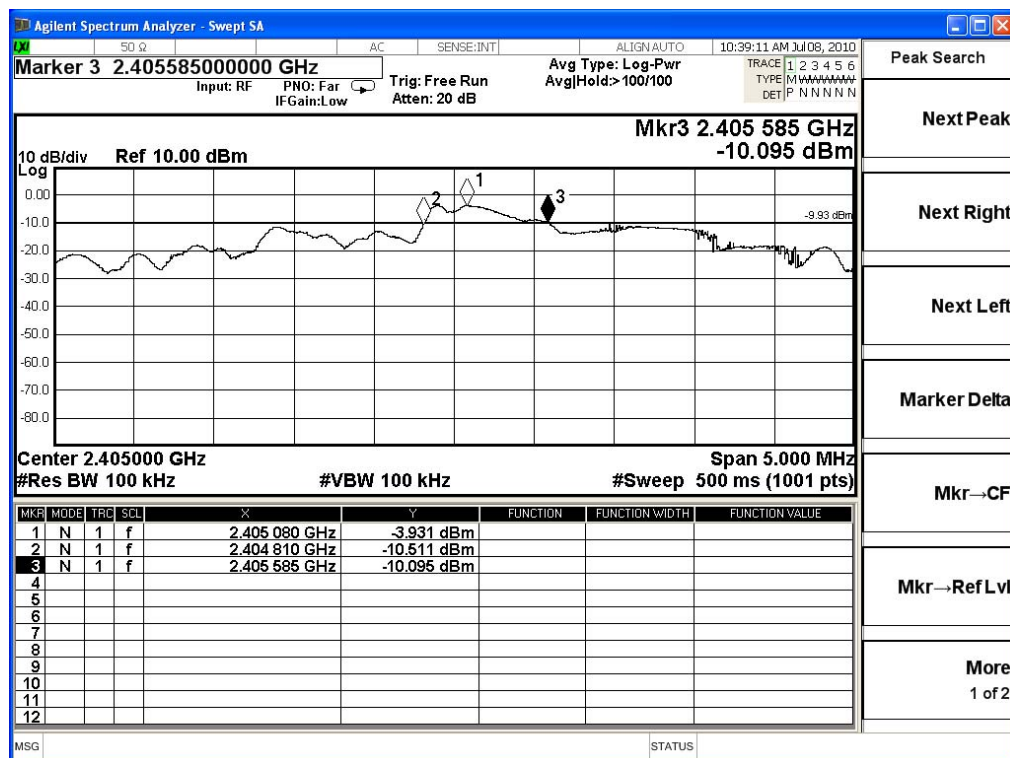
$\pm 150\text{Hz}$

## 7.6. Test Result of Occupied Bandwidth

Product : Dongle  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2405.00	775	>500	Pass

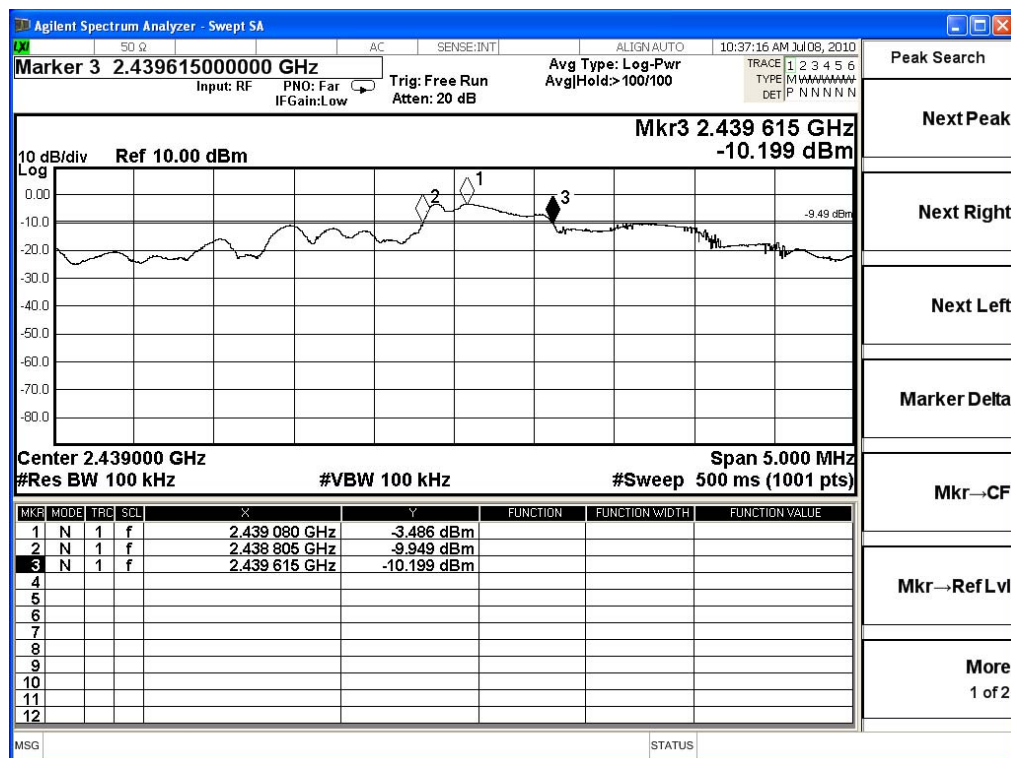
Figure Channel 02:



Product : Dongle  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2439MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
32	2439.00	810	>500	Pass

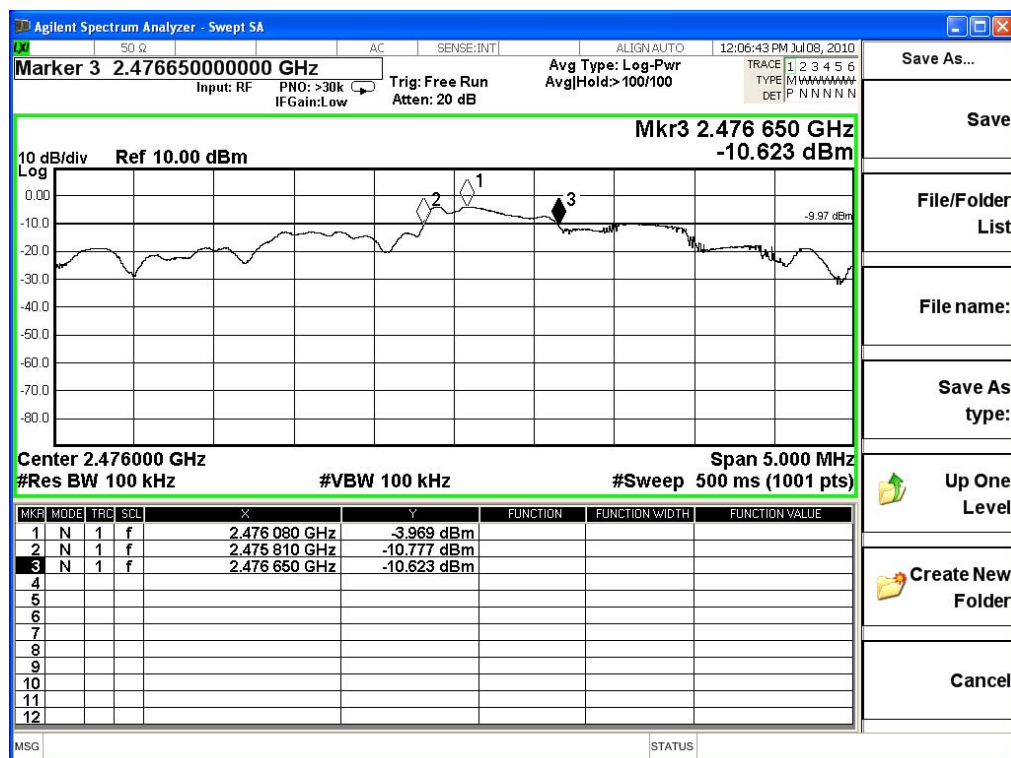
Figure Channel 41:



Product : Dongle  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2476MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
64	2476.00	840	>500	Pass

**Figure Channel 64:**



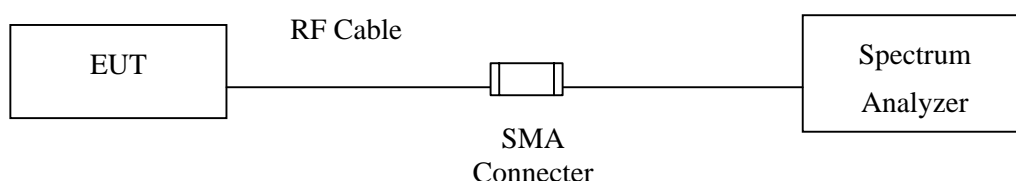
## 8. Power Density

### 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note: 1. All equipments are calibrated every one year.  
2. The test instruments marked by "X" are used to measure the final test results.

### 8.2. Test Setup



### 8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 8.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, VBW=10KHz, Sweep time=(SPAN/3KHz), detector=Peak detector

### 8.5. Uncertainty

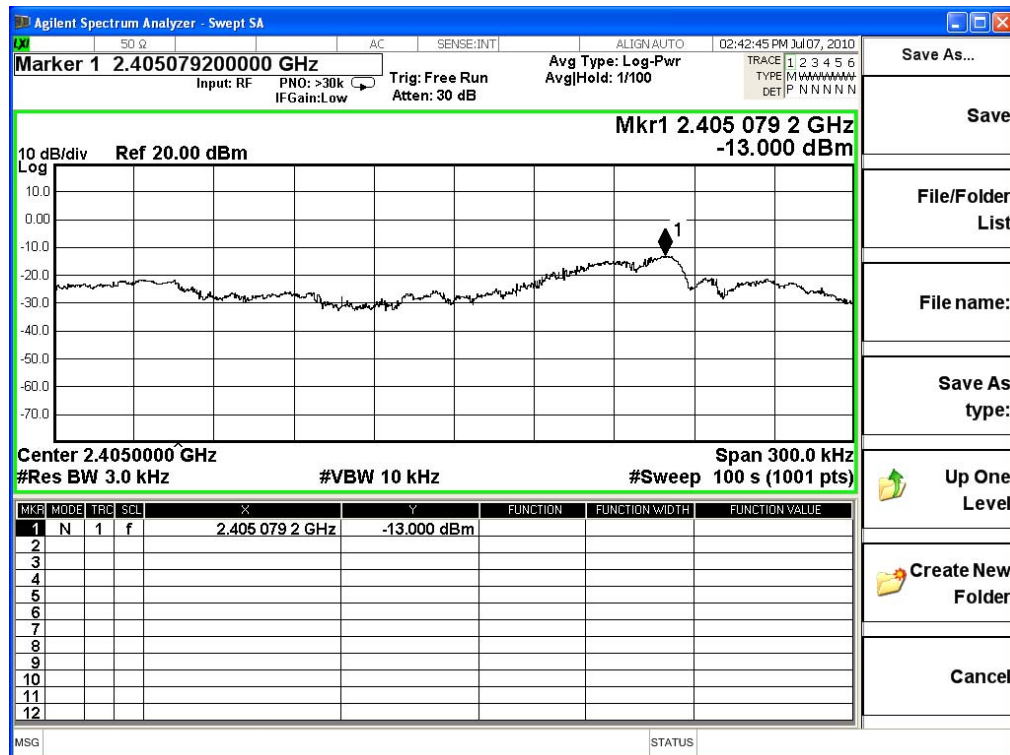
$\pm 1.27$  dB

## 8.6. Test Result of Power Density

Product : Dongle  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit(2405MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
02	2405.00	-13.000	< 8dBm	Pass

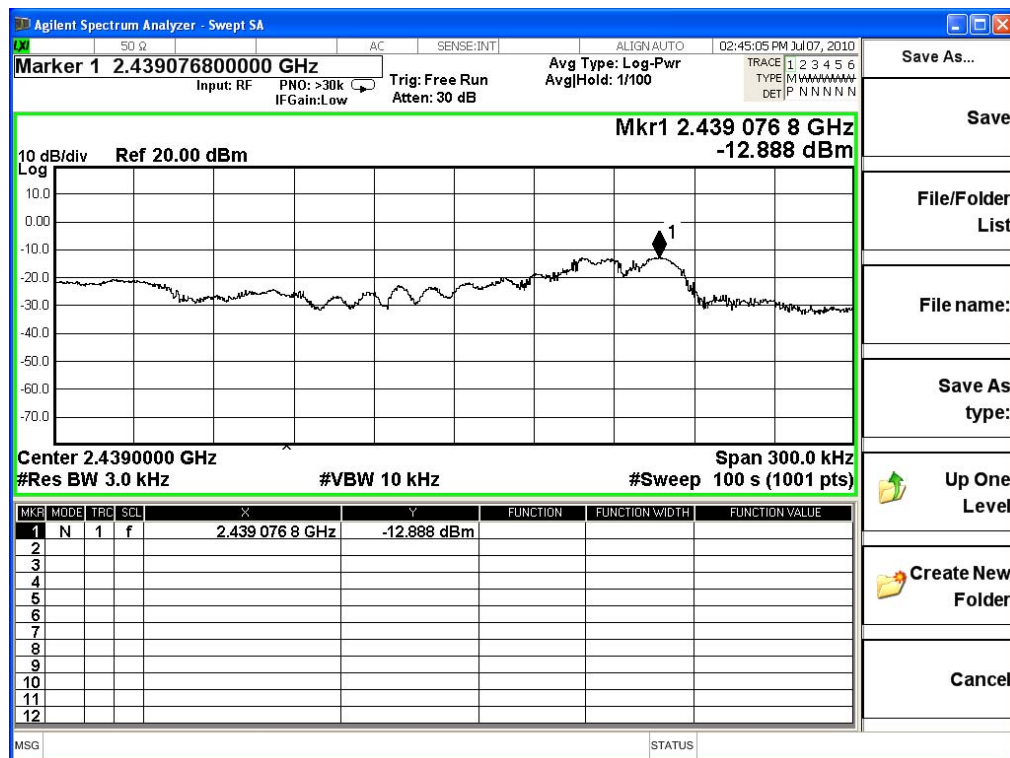
Figure Channel 02:



Product : Dongle  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit (2439MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
32	2439	-12.888	< 8dBm	Pass

Figure Channel 32:

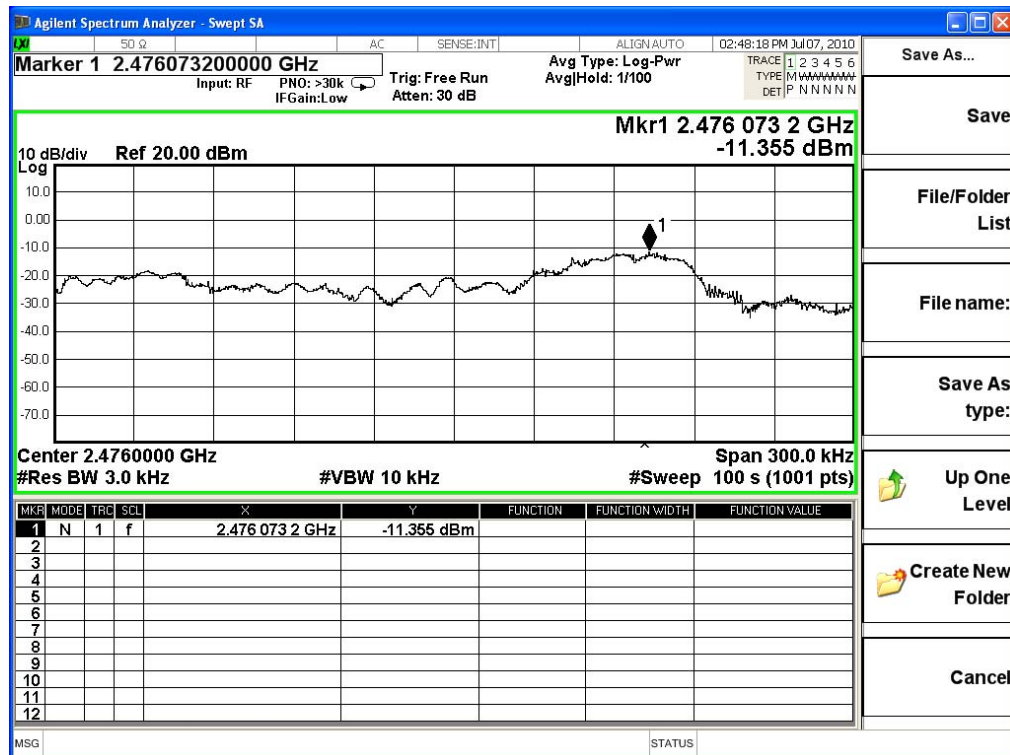




Product : Dongle  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2476MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
64	2476.00	-11.355	< 8dBm	Pass

Figure Channel 64:



## 9. Duty Cycle

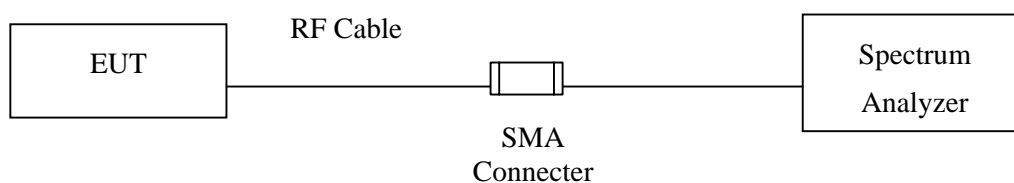
### 9.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2010

Note: 1. All equipments are calibrated every one year.

2. The test equipments marked by "X" are used to measure the final test results.

### 9.2. Test Setup

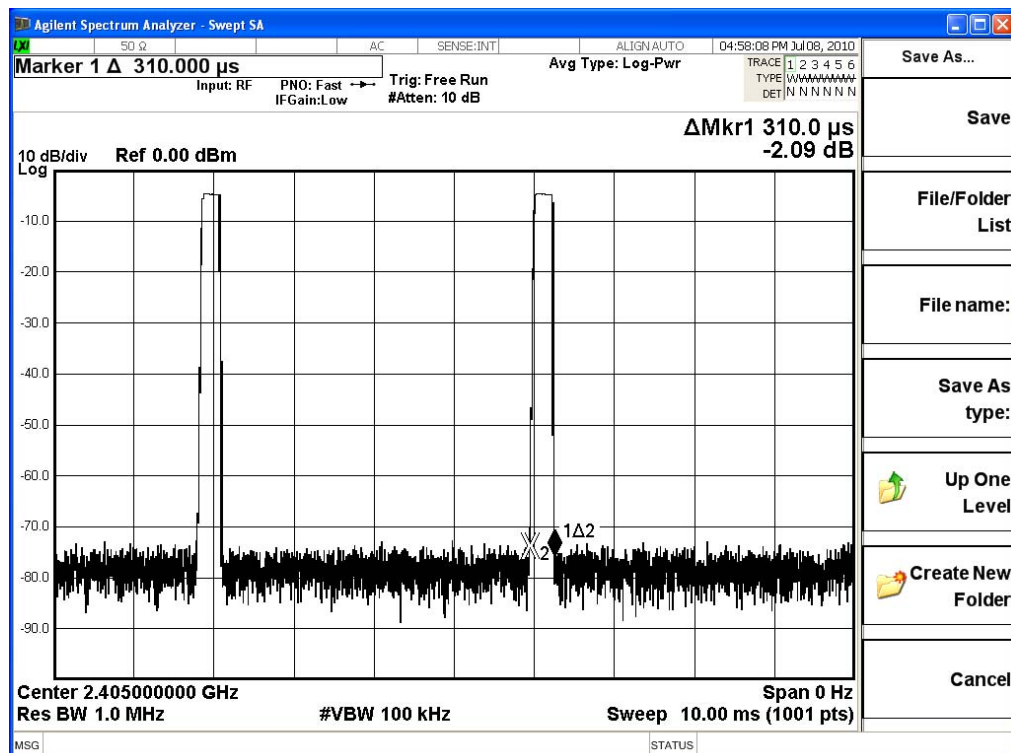
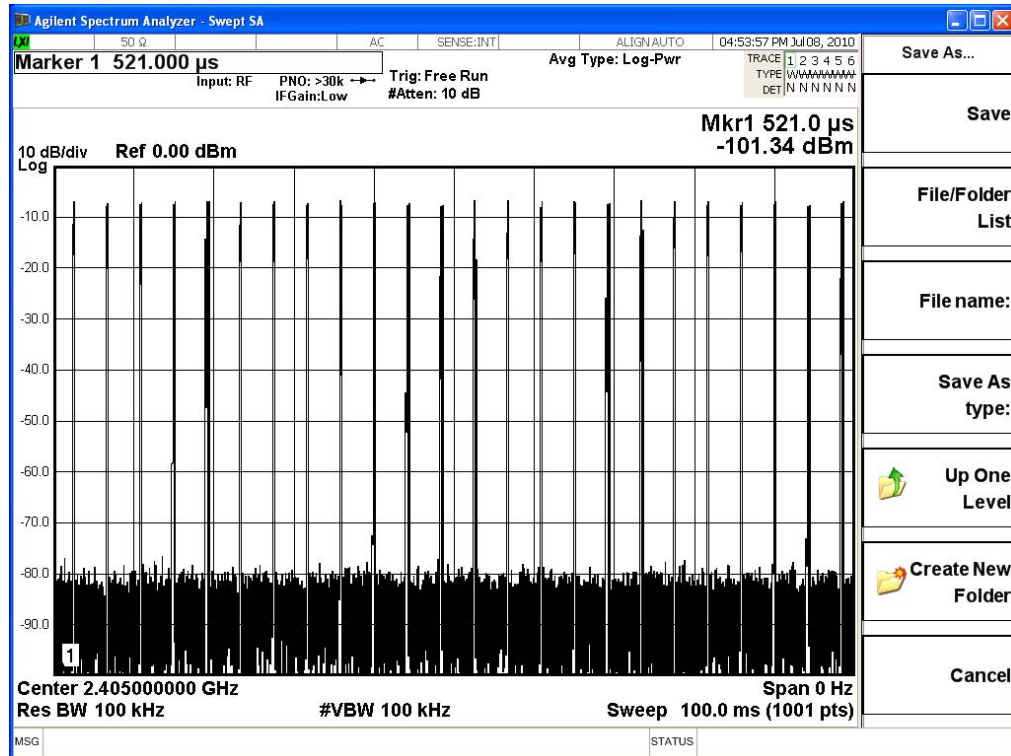


### 9.3. Uncertainty

$\pm 150\text{Hz}$

## 9.4. Test Result of Duty Cycle

Product : Dongle  
 Test Item : Duty Cycle Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit



Time on of 100ms= (310us\*24) = 7.44 ms

Duty Cycle= 7.44ms / 100ms= 0.0744

Duty Cycle correction factor= 20 LOG 0.0744= -22.569 dB

Duty Cycle correction factor	-20.000	dB
------------------------------	---------	----

Remark:

If Duty Cycle is smaller than -20dB, based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

## **10. EMI Reduction Method During Compliance Testing**

No modification was made during testing.