



## Test Report

Product Name	BT USB Dongle
Model No.	WB410C
FCC ID.	DoC

Applicant	Lite-On TECHNOLOGY CORP.
Address	4F,90,Chien 1 Road,Chung-Ho,Taipei Hsien 235,Taiwan,R.O.C.

Date of Receipt	May. 05, 2009
Issued Date	May. 15, 2009
Report No.	095081R-RFUSP01V02
Report Version	V1.0

The Test Results relate only to the samples tested.

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

# Test Report Certification

Issued Date: May. 15, 2009

Report No.: 095081R-RFUSP01V02



Product Name	BT USB Dongle
Applicant	Lite-On TECHNOLOGY CORP.
Address	4F,90,Chien 1 Road,Chung-Ho,Taipei Hsien 235,Taiwan,R.O.C.
Manufacturer	DONG GUAN G-COM COMPUTER CO., LTD.
Model No.	WB410C
FCC ID.	DoC
Rated Voltage	AC 120V/60Hz
Working Voltage	DC 5V (Power by USB)
Trade Name	Lite-On
Applicable Standard	FCC CFR Title 47 Part 15 Subpart B: 2007 ANSI C63.4: 2003
Test Result	Complied



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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	BT USB Dongle
Trade Name	Lite-On
Model No.	WB410C
FCC ID.	DoC
Frequency Range	2402 – 2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / $\pi$ /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Printed on PCB
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	DONG GUAN G-COM	N/A	-0.364dBi for 2.4 GHz

# Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

## Note:

1. The EUT is a BT USB Dongle with a built-in 2.4GHz Bluetooth V2.1+EDR transceiver
2. These tests were conducted on a sample for demonstrating compliance of Bluetooth receiver with Part 15 Subpart B.
3. Regarding to the operation frequency band, the lowest, middle, and highest frequency are selected to perform the test.
4. This device is a composite device in accordance with Part 15 regulations. The function for the 2.4GHz transmitting was measured and made a test report that the report number is 095081R-RFUSP06V01, certified under FCC ID: PPQ-WB410C
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Receiver
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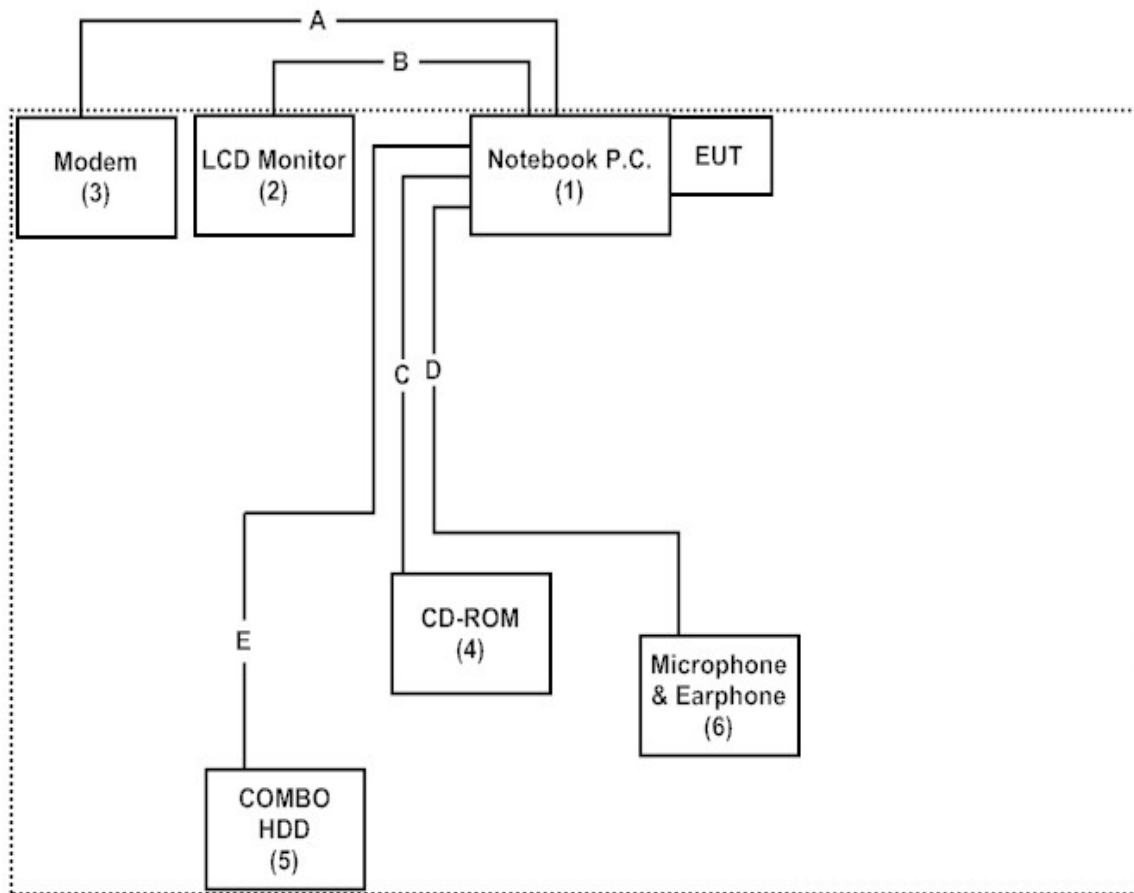
## 1.2. Test System Details

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.	FCC ID	Power Cord
1 Notebook P.C.	DELL	PPT	N/A	DoC	Non-Shielded, 1.8m
2 LCD Monitor	CMV	CT-730D	FNC122F57CA1062	DoC	Non-Shielded, 1.8m
3 Modem	ACEEX	DM-1414	0102027536	IFAXDM1414	Non-Shielded, 1.8m
4 CD-ROM	DELL	PPT	N/A	DoC	Non-Shielded, 0.8m
5 COMBO HDD	TeraSys	F12-UF	A0100215-64b0019	DoC	Non-Shielded 1.8m
6 Microphone & Earphone	PCHOME	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	Modem Cable	Shielded,1.5m
B	VGA Cable	Non-Shielded,1.6m ,with one ferrite core bonded.
C	USB Cable	Shielded,1.6m
D	Earphone Cable	Non-Shielded,1.2m
E	USB Cable	Shielded,1.6m

### 1.3. Configuration of Test System



### 1.4. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.3
- (2) Execute the CSR program (the continuous receiver program) on the EUT
- (3) Setup the test mode, the test channel, and the data rate.
- (4) Press OK to start the transmission.
- (5) Verify that the EUT works correctly.

## 1.5. 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/modules/myalbum/>

The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site :  
<http://www.quietek.com/>

Site Description: 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

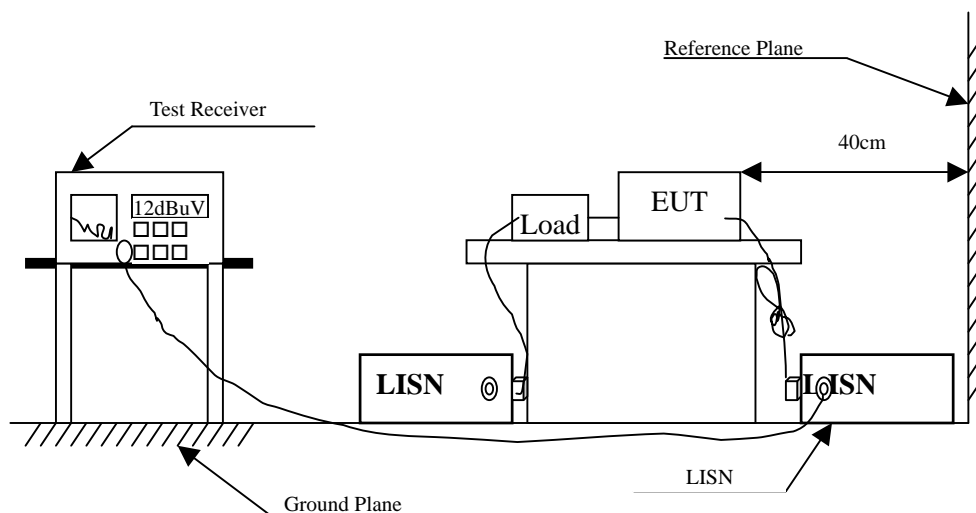
### 2.1. Test Equipment

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 30/825442/014	Feb., 2009	
2	L.I.S.N.	R & S	ESH3-Z5/825562/002	Feb., 2009	EUT
3	L.I.S.N.	R & S	ENV4200/848411/010	Feb., 2009	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2/100410	July, 2008	
5	No.1 Shielded Room			N/A	

Note: All equipments are calibrated every one year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart B Paragraph 15.107 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

## 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.

The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 2.5. Uncertainty

$\pm 2.26$  dB

## 2.6. Test Result of Conducted Emission

Product : BT USB Dongle  
Test Item : Conducted Emission Test  
Power Line : Line 1  
Test Mode : Mode 1: Receiver (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.173	9.815	34.580	44.395	-20.948	65.343
0.279	9.830	28.580	38.410	-23.904	62.314
0.396	9.820	26.920	36.740	-22.231	58.971
0.732	9.830	23.840	33.670	-22.330	56.000
1.869	9.850	26.670	36.520	-19.480	56.000
3.502	9.860	37.190	47.050	-8.950	56.000
<b>Average</b>					
0.173	9.815	28.120	37.935	-17.408	55.343
0.279	9.830	24.370	34.200	-18.114	52.314
0.396	9.820	21.380	31.200	-17.771	48.971
0.732	9.830	17.800	27.630	-18.370	46.000
1.869	9.850	18.300	28.150	-17.850	46.000
3.502	9.860	23.110	32.970	-13.030	46.000

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 : BT USB Dongle  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Receiver (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.170	9.866	38.190	48.056	-17.373	65.429
0.228	9.860	30.470	40.330	-23.441	63.771
0.283	9.850	30.300	40.150	-22.050	62.200
0.564	9.830	25.650	35.480	-20.520	56.000
1.865	9.850	30.250	40.100	-15.900	56.000
3.388	9.860	35.550	45.410	-10.590	56.000
<b>Average</b>					
0.170	9.866	32.120	41.986	-13.443	55.429
0.228	9.860	24.710	34.570	-19.201	53.771
0.283	9.850	26.170	36.020	-16.180	52.200
0.564	9.830	19.900	29.730	-16.270	46.000
1.865	9.850	22.700	32.550	-13.450	46.000
3.388	9.860	21.660	31.520	-14.480	46.000

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. Radiated Emission

#### 3.1. Test Equipment

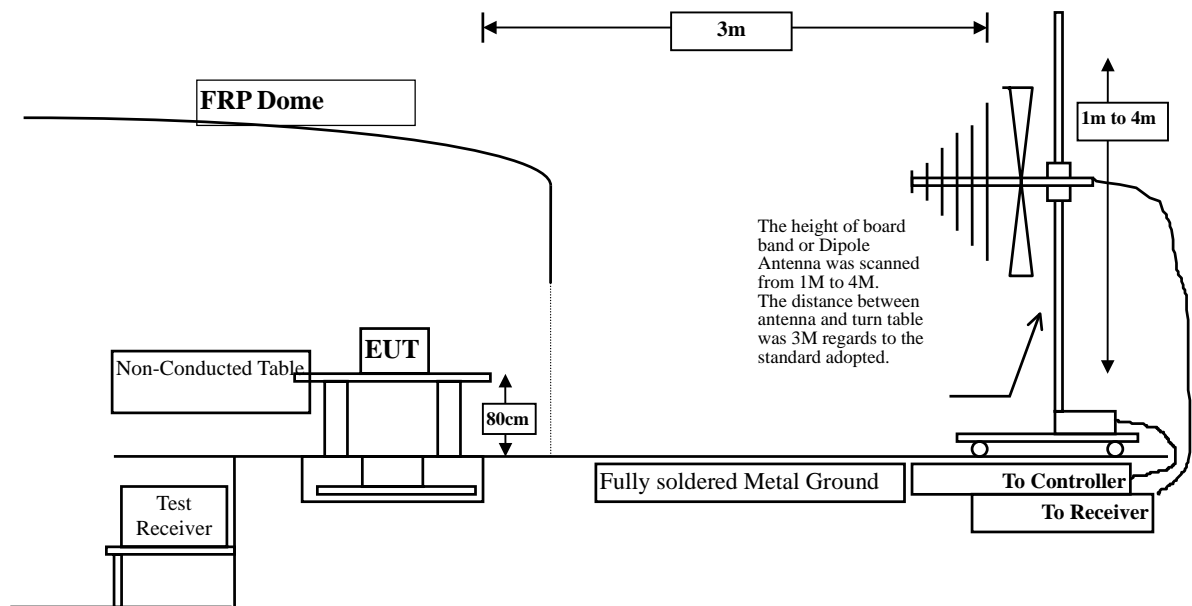
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Pre-Amplifier	HP	8447D/2944A09549	Sep., 2008
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	HP	E4407B / US39440758	May, 2009
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

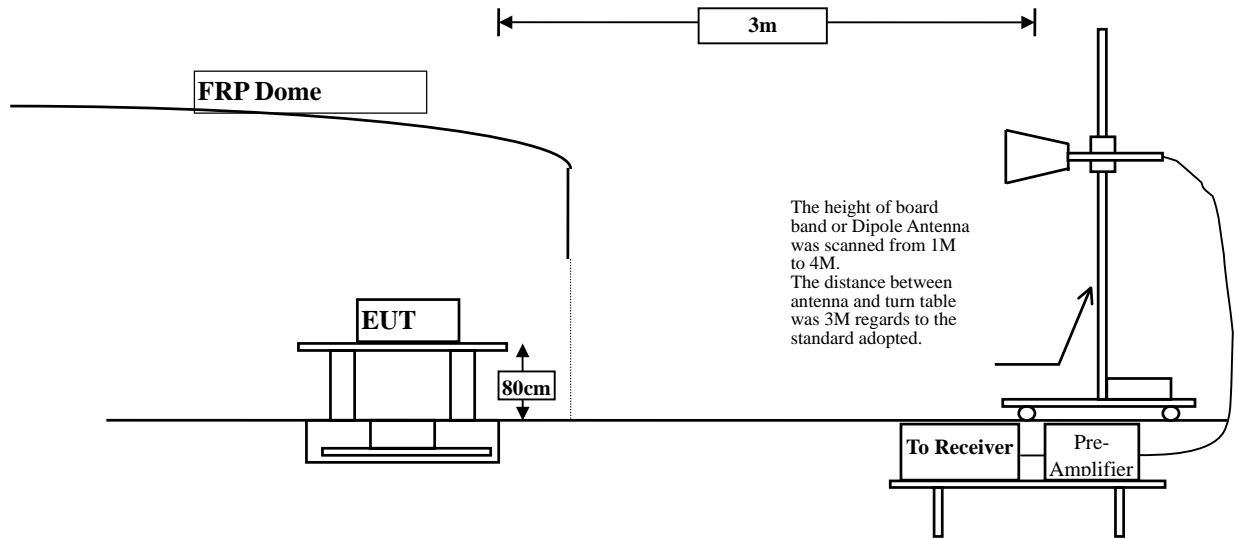
- Note:
1. All equipments are calibrated every one year.
  2. The test equipments marked by "X" are used to measure the final test results.

#### 3.2. Test Setup

Below 1GHz



Above 1GHz



### 3.3. Limits

FCC Part 15 Subpart B Paragraph 15.109 Limits		
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 :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

### **3.4. Test Procedure**

The EUT and its Peripherals are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz. The EUT was setup to ANSI C63.4, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

### **3.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

### 3.6. Test Result of Radiated Emission

Product : BT USB Dongle  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test Mode : Mode 1: Receiver (2402MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2400.500	2.964	39.140	42.103	-31.897	74.000
4801.000	9.514	36.020	45.534	-28.466	74.000
7201.500	14.029	34.840	48.868	-25.132	74.000
<b>Average Detector:</b>					
--					
<b>Peak Detector:</b>					
2400.500	1.951	37.060	39.011	-34.989	74.000
4801.000	8.226	36.020	44.247	-29.753	74.000
7201.500	15.145	34.640	49.785	-24.215	74.000
<b>Average Detector:</b>					
--					

Note:

1. The reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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 : BT USB Dongle  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test Mode : Mode 1: Receiver (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2439.500	2.979	39.130	42.109	-31.891	74.000
4879.000	9.387	36.870	46.256	-27.744	74.000
7318.500	14.316	33.490	47.806	-26.194	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Peak Detector:</b>					
2439.500	2.173	36.070	38.244	-35.756	74.000
4879.000	8.846	36.260	45.106	-28.894	74.000
7318.500	15.031	34.260	49.291	-24.709	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

Note:

1. The reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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 : BT USB Dongle  
Test Item : Harmonic Radiated Emission  
Test Site : No.3 OATS  
Test Mode : Mode 1: Receiver (2480MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2478.500	3.073	36.710	39.783	-34.217	74.000
4918.000	9.404	35.870	45.274	-28.726	74.000
7357.500	14.503	33.650	48.153	-25.847	74.000
<b>Average</b>					
<b>Detector:</b>					
--					
<b>Peak Detector:</b>					
2478.500	2.518	36.510	39.028	-34.972	74.000
4918.000	9.270	35.910	45.179	-28.821	74.000
7357.500	15.077	33.720	48.797	-25.203	74.000
<b>Average</b>					
<b>Detector:</b>					
--					

Note:

1. The reading levels below 1GHz and above 1GHz are quasi-peak values and peak/average values, respectively.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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 : BT USB Dongle  
 Test Item : General Radiated Emission  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Receiver (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
255.040	-5.498	27.507	22.009	-23.991	46.000
381.140	-1.606	26.625	25.019	-20.981	46.000
460.680	1.131	26.047	27.178	-18.822	46.000
606.180	4.154	26.645	30.799	-15.201	46.000
701.240	2.213	26.688	28.901	-17.099	46.000
773.020	3.753	30.808	34.561	-11.439	46.000
<b>Vertical</b>					
136.700	-5.427	27.339	21.912	-21.588	43.500
381.140	-2.176	26.625	24.449	-21.551	46.000
536.340	-0.833	27.202	26.369	-19.631	46.000
606.180	-2.106	26.645	24.539	-21.461	46.000
773.020	2.293	30.808	33.101	-12.899	46.000
864.200	0.265	30.393	30.658	-15.342	46.000

Note:

1. The reading levels below 1GHz are quasi-peak values.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

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

No modification was made during testing.