



<b>Prüfbericht - Nr.: 17019148 001</b>		<b>Seite 1 von 24</b>	
<i>Test Report No.:</i>		<i>Page 1 of 24</i>	
<b>Auftraggeber:</b>	Primax Electronics Ltd.		
<i>Client:</i>	No. 669, Ruey Kuang Rd. Neihu, Taipei 114, Taiwan		
<b>Gegenstand der Prüfung:</b>	Lenovo Wireless Dongle		
<i>Test item:</i>			
<b>Bezeichnung:</b>	MORFFHL-D	<b>Serien-Nr.:</b>	n.a.
<i>Identification:</i>		<i>Serial No.:</i>	
<b>Wareneingangs-Nr.:</b>	163072199	<b>Eingangsdatum:</b>	2010-12-23
<i>Receipt No.:</i>		<i>Date of receipt:</i>	
<b>Prüfort:</b>	Neutron Engineering Inc.		
<i>Testing location:</i>	No. 3. Jinshagang 1st Road, ShiXia, DaLang Town, Dong Guan, China FCC Registration No.: 319330 Industry Canada Test Site No.: 4428B-1		
<b>Prüfgrundlage:</b>	FCC CFR47 Part 15: Subpart C Section 15.249 FCC CFR47 Part 15: Subpart C Section 15.209 RSS-210 Issue 8 December 2010 RSS-Gen Issue 3 December 2010 RSS-102 Issue 4 March 2010		
<b>Prüfresultat:</b>	<b>Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).</b>		
<i>Test Result:</i>	<i>The test item passed the test specification(s).</i>		
<b>Prüflaboratorium:</b>	TÜV Rheinland (Shenzhen) Co., Ltd.		
<i>Testing Laboratory:</i>			
<b>geprüft/ tested by:</b>	<b>kontrolliert/ reviewed by:</b>		
			
2011-03-01	Sam Lin/ Project Manager	2011-03-04	Shawn Peng/ Manager
<b>Datum</b>	<b>Name/Stellung</b>	<b>Unterschrift</b>	<b>Datum</b>
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	<i>Date</i>
<b>Name/Stellung</b>	<b>Unterschrift</b>	<b>Name/Stellung</b>	<b>Unterschrift</b>
<i>Name/Position</i>	<i>Signature</i>	<i>Name/Position</i>	<i>Signature</i>
<b>Sonstiges/ Other Aspects:</b>			
<b>Abkürzungen:</b>	<i>P(ass) = entspricht Prüfgrundlage</i>	<b>Abbreviations:</b>	<i>P(ass) = passed</i>
	<i>F(ail) = entspricht nicht Prüfgrundlage</i>		<i>F(ail) = failed</i>
	<i>N/A = nicht anwendbar</i>		<i>N/A = not applicable</i>
	<i>N/T = nicht getestet</i>		<i>N/T = not tested</i>
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b>			
<i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

## TEST SUMMARY

**5.1.1 FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS**

RESULT: *Passed*

**5.1.2 RADIATED EMISSIONS**

RESULT: *Passed*

**5.1.3 99% BANDWIDTH**

RESULT: *Passed*

**5.1.4 BAND EDGE**

RESULT: *Passed*

**6.1.1 ELECTROMAGNETIC FIELDS**

RESULT: *Passed*

## Contents

<b>1.</b>	<b>GENERAL REMARKS .....</b>	<b>4</b>
<b>1.1</b>	<b>COMPLEMENTARY MATERIALS .....</b>	<b>4</b>
<b>2.</b>	<b>TEST SITES .....</b>	<b>4</b>
<b>2.1</b>	<b>TEST FACILITIES .....</b>	<b>4</b>
<b>2.2</b>	<b>LIST OF TEST AND MEASUREMENT INSTRUMENTS.....</b>	<b>5</b>
<b>2.3</b>	<b>TRACEABILITY .....</b>	<b>5</b>
<b>2.4</b>	<b>CALIBRATION .....</b>	<b>6</b>
<b>2.5</b>	<b>MEASUREMENT UNCERTAINTY.....</b>	<b>6</b>
<b>2.6</b>	<b>LOCATION OF ORIGINAL DATA.....</b>	<b>6</b>
<b>2.7</b>	<b>STATUS OF FACILITY USED FOR TESTING.....</b>	<b>6</b>
<b>3.</b>	<b>GENERAL PRODUCT INFORMATION .....</b>	<b>7</b>
<b>3.1</b>	<b>PRODUCT FUNCTION AND INTENDED USE.....</b>	<b>7</b>
<b>3.2</b>	<b>RATINGS AND SYSTEM DETAILS .....</b>	<b>7</b>
<b>3.3</b>	<b>INDEPENDENT OPERATION MODES .....</b>	<b>8</b>
<b>3.4</b>	<b>NOISE GENERATING AND NOISE SUPPRESSING PARTS .....</b>	<b>8</b>
<b>3.5</b>	<b>SUBMITTED DOCUMENTS .....</b>	<b>8</b>
<b>4.</b>	<b>TEST SET-UP AND OPERATION MODES .....</b>	<b>9</b>
<b>4.1</b>	<b>PRINCIPLE OF CONFIGURATION SELECTION.....</b>	<b>9</b>
<b>4.2</b>	<b>TEST OPERATION AND TEST SOFTWARE .....</b>	<b>9</b>
<b>4.3</b>	<b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....</b>	<b>9</b>
<b>4.4</b>	<b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....</b>	<b>9</b>
<b>4.5</b>	<b>TEST SETUP DIAGRAM .....</b>	<b>10</b>
<b>5.</b>	<b>TEST RESULTS .....</b>	<b>12</b>
<b>5.1</b>	<b>TRANSMITTER REQUIREMENT &amp; TEST SUITES .....</b>	<b>12</b>
<b>5.1.1</b>	<i>Field strength of fundamental and harmonics.....</i>	<b>12</b>
<b>5.1.2</b>	<i>Radiated Emissions .....</i>	<b>16</b>
<b>5.1.3</b>	<i>99% Bandwidth .....</i>	<b>17</b>
<b>5.1.4</b>	<i>Band Edge.....</i>	<b>20</b>
<b>6.</b>	<b>SAFETY HUMAN EXPOSURE .....</b>	<b>21</b>
<b>6.1</b>	<b>RADIO FREQUENCY EXPOSURE COMPLIANCE.....</b>	<b>21</b>
<b>6.1.1</b>	<i>Electromagnetic Fields.....</i>	<b>21</b>
<b>7.</b>	<b>PHOTOGRAPHS OF THE TEST SET-UP .....</b>	<b>22</b>
<b>8.</b>	<b>LIST OF TABLES .....</b>	<b>24</b>
<b>9.</b>	<b>LIST OF PHOTOGRAPHS .....</b>	<b>24</b>

## 1. General Remarks

### 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test Result of Radiated Emissions

## 2. Test Sites

### 2.1 Test Facilities

Neutron Engineering Inc.

No. 3. Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China

FCC Registration No.: 319330

Industry Canada Test site No.: 4428B-1

The tests at the test site have been conducted under the supervision of a TÜV engineer.

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
<b>Radiated emissions</b>				
Antenna	Schwarzbeck	VULB9160	9160-3232	Jun.08.2011
Triple Loop Antenna	R&S	HFH2-Z2	830749/020	May.27.2011
Amplifier	HP	8447D	2944A09673	May.26.2011
Test Receiver	R&S	ESCI	100382	May.26.2011
Test Cable	N/A	C-01_CB03	N/A	Jul.06.2011
Controller	CT	SC100	N/A	N/A
Antenna	ETS	3115	00075789	May.27.2011
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170340	Dec.16.2011
Amplifier	Agilent	8449B	3008A02274	May.26.2011
Spectrum	Agilent	E4408B	US39240143	Nov.26.2011
Test Cable	HUBER+SUHNER	SUCOFLEX_8m	313794/4	Apr.12.2011
Controller	CT	SC100	N/A	N/A

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO/IEC 17025 are:

**Table 2: Measurement Uncertainty**

Items		Extended Uncertainty
CE	Disturbance Voltage (dBuV)	$U=\pm 1.94\text{dB}$ , $k=2$ , $\sigma=95\%$
RE (30-200MHz)	Field strength (dBuV/m)	$U=\pm 3.82\text{dB}$ , $k=2$ , $\sigma=95\%$
RE (200-1000MHz)	Field strength (dBuV/m)	$U=\pm 3.94\text{dB}$ , $k=2$ , $\sigma=95\%$
RE (1-18GHz)	Field strength (dBuV/m)	$U=\pm 1.47\text{dB}$ , $k=2$ , $\sigma=95\%$
RE (18-30GHz)	Field strength (dBuV/m)	$U=\pm 1.53\text{dB}$ , $k=2$ , $\sigma=95\%$

## 2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached in this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

The Neutron Engineering Inc. facility located at No. 3. Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a wireless dongle used together with personal computer for domestic use. For details refer to the User Manual, technical description and Circuit Diagram.

#### 3.2 Ratings and System Details

**Table 3: Information of EUT**

Kind of Equipment:	Lenovo Wireless Dongle
Type Designation:	MORFFHL-D
FCC ID	EMJDMORFFHL-D
IC	4251A-DMORFFHLD

**Table 4: Technical Specification of EUT**

Technical Specification	Value
Operating Frequency	2402-2479 MHz
Operation Voltage	DC 5V (via USB port)
Modulation	GFSK
Antenna Type	Internal Chip Antenna, Non-User Replaceable
External Ports	None
Antenna Gain	2.5dBi
RF Output Power	0.962mW (-0.17dBm)
Number of channels	70
Channel frequency (MHz)	2402, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2479

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. Transmitting
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel
- B. Standby
- C. Receiving
- D. Off

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

### 3.5 Submitted Documents

- Bill of Material
- PCB Layout
- Photo Document
- Technical Description
- Circuit Diagram
- Instruction Manual
- Rating Label



## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5.  
All testing were performed according to the procedures in ANSI C63.10: 2009.

### 4.3 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Notebook	ASUS	F9E	n.a.

### 4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

## 4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

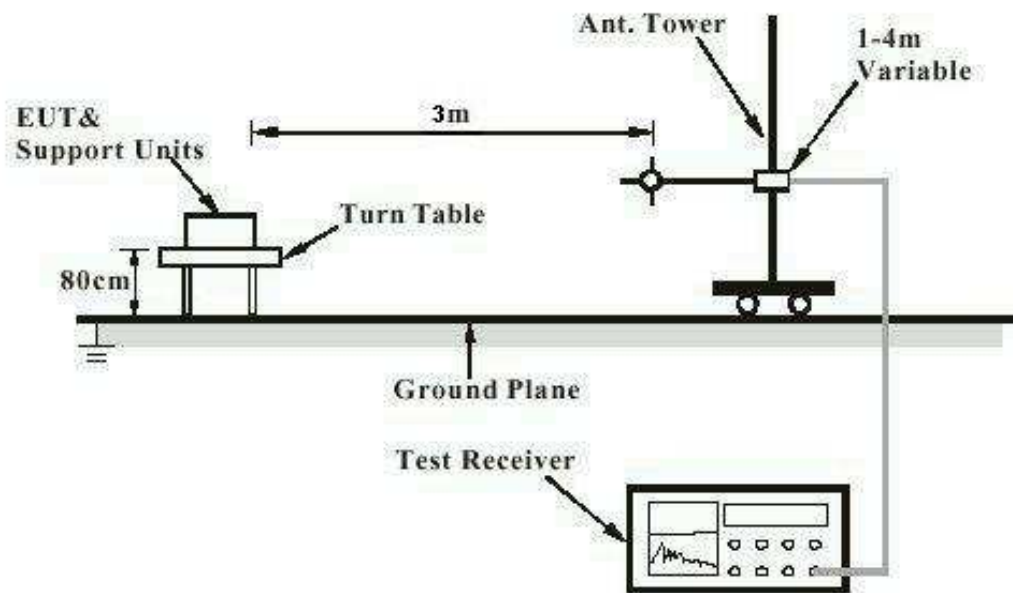
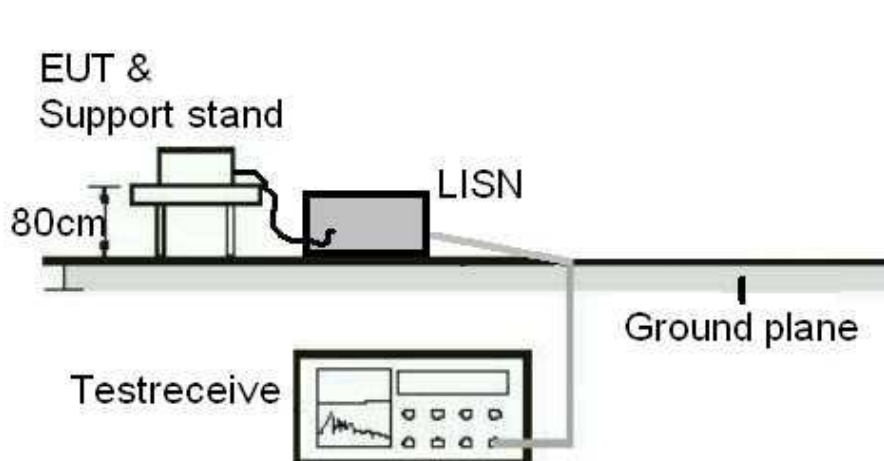
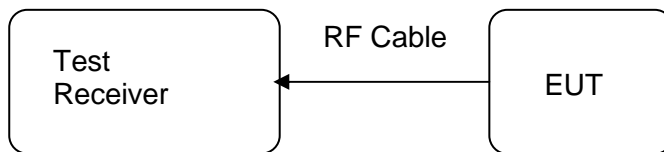


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



**Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement**



## 5. Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Field strength of fundamental and harmonics

**RESULT:**
**Passed**

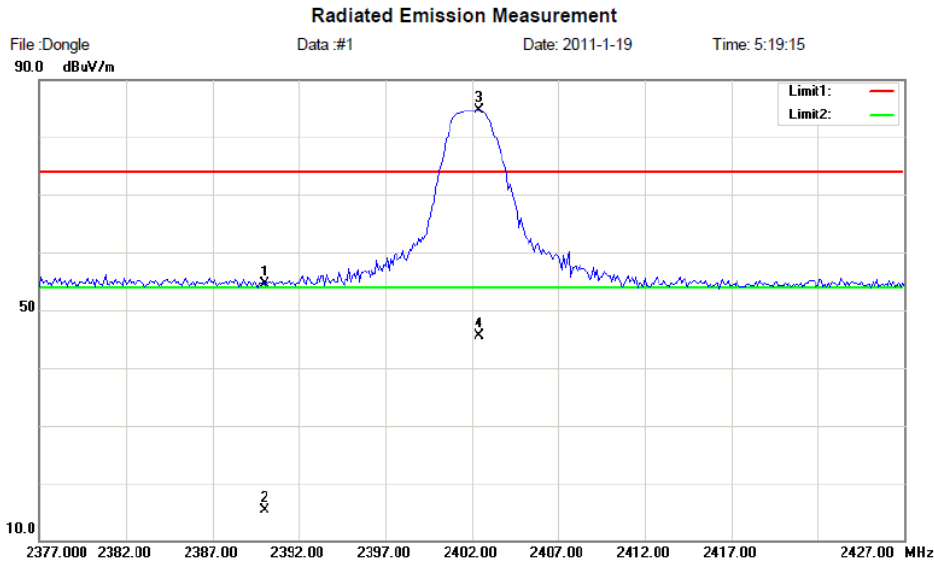
Test date : 2011-01-19  
 Test standard : FCC Part 15.249(a)  
 Clause A2.9 of RSS-210  
 Basic standard : ANSI C63.10: 2009  
 Limit : FCC Part 15.249(a)  
 Clause A2.9(a) of RSS-210  
 Kind of test site : 3m Semi-Anechoic Chamber

**Test setup**

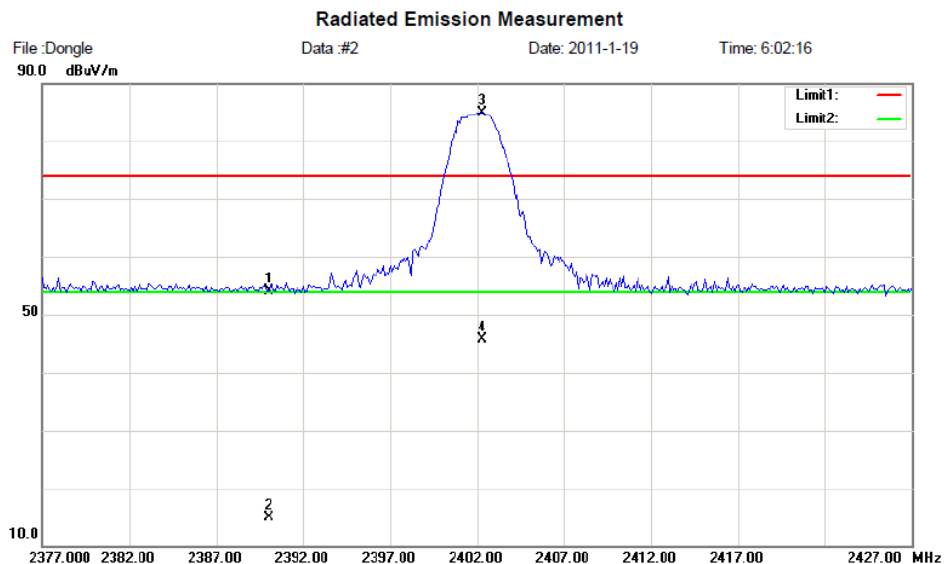
Operation Mode : A  
 Ambient temperature : 23°C  
 Relative humidity : 58%  
 Atmospheric pressure : 101.0 kPa

**Table 5: Test results of Field strength of fundamental**

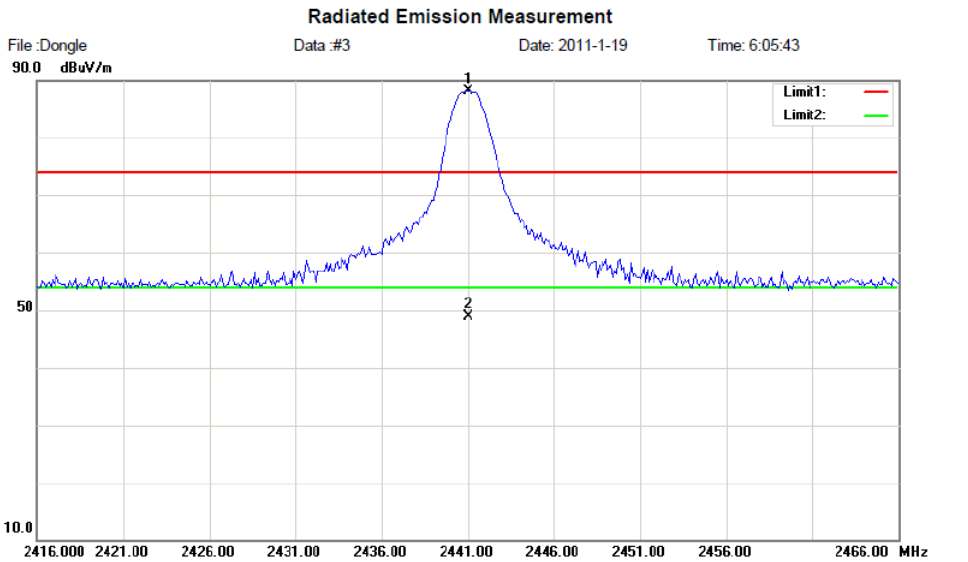
Frequency (MHz)	Field Strength of Fundamental					Verdict
	Reading Level (dBuV/m)		Limit (dBuV/m)		Antenna Polarization	
	Average	Peak	Average	Peak		
2402	45.72	84.88	94	114	Horizontal	Pass
	45.55	84.71	94	114	Vertical	Pass
2441	48.86	88.02	94	114	Horizontal	Pass
	46.75	85.91	94	114	Vertical	Pass
2479	49.21	88.37	94	114	Horizontal	Pass
	48.85	88.01	94	114	Vertical	Pass

**Test Plots of Field strength of fundamental**
**Low Channel**


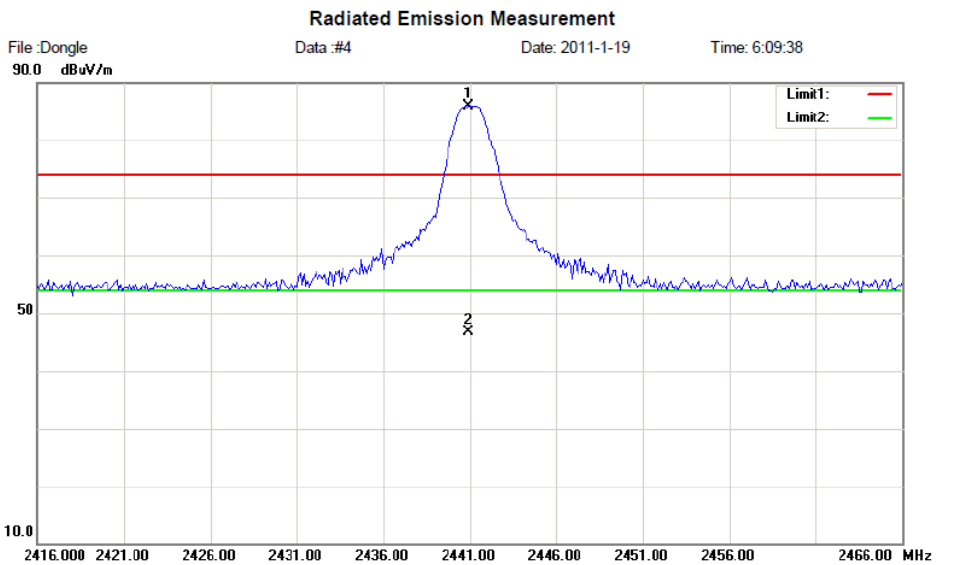
Site DG-CB03	Polarization: <b>Vertical</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2402MHz		



Site DG-CB03	Polarization: <b>Horizontal</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2402MHz		

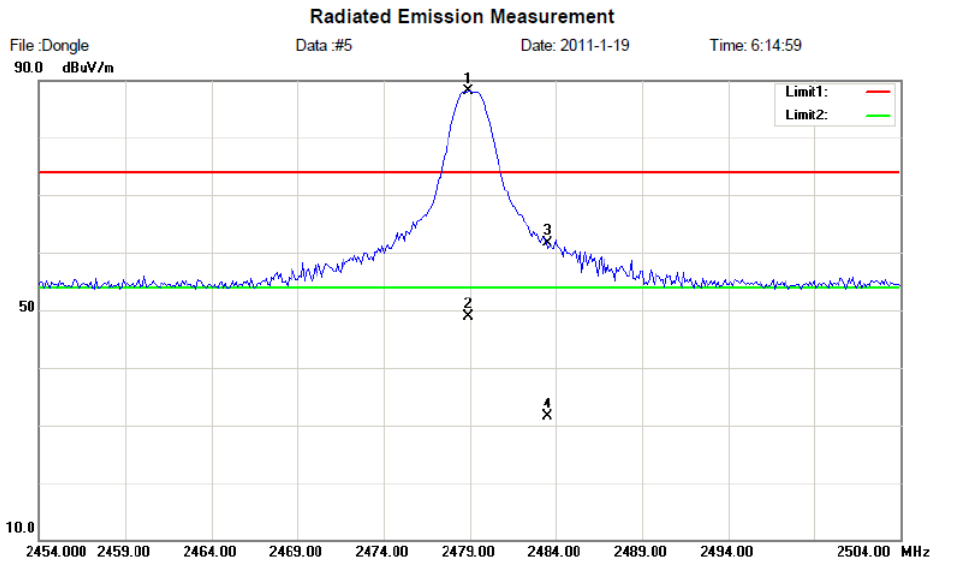
**Middle Channel**


Site DG-CB03	Polarization: <b>Horizontal</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2441MHz		

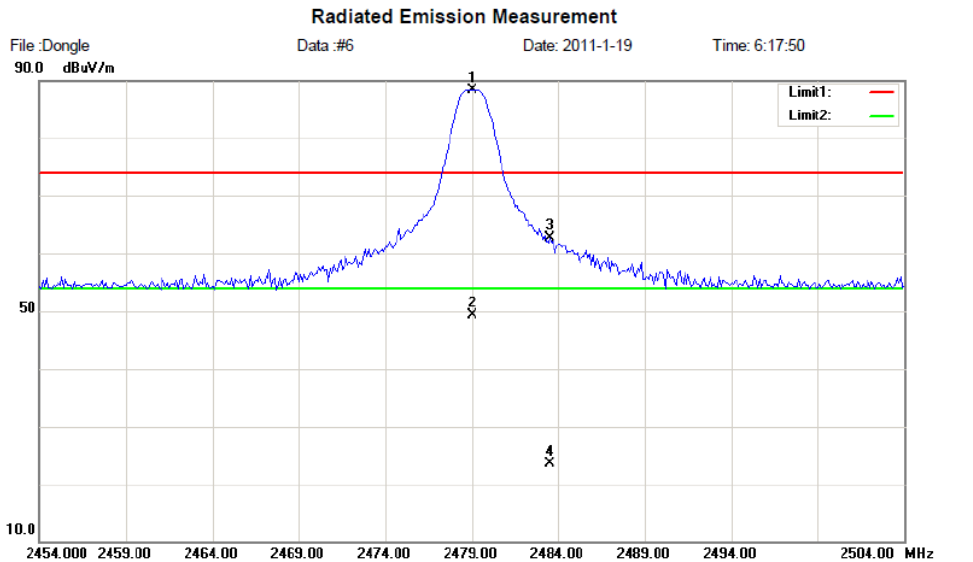


Site DG-CB03	Polarization: <b>Vertical</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2441MHz		

High Channel



Site DG-CB03	Polarization: <b>Vertical</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2479MHz		



Site DG-CB03	Polarization: <b>Horizontal</b>	Temperature: 23
Limit: FCC_RF_1G-40G_(Peak)	Power: DC 5V	Humidity: 58 %
EUT: dongle	Distance: 3m	
M/N:		
Mode: TX		
Note: TX 2479MHz		

## 5.1.2 Radiated Emissions

**RESULT:****Passed**

Test date	:	2011-01-19 to 2011-01-24
Test standard	:	FCC Part 15.249(a) & (d), (e) Clause A2.9 of RSS-210
Basic standard	:	ANSI C63.10: 2009
Limit	:	FCC Part 15.249(a) & FCC Part 15.209 (a) Clause A2.9(a) & (b) of RSS-210
Kind of test site	:	3m Semi-Anechoic Chamber

**Test setup**

Operation Mode	:	A, C
Ambient temperature	:	23°C
Relative humidity	:	58%
Atmospheric pressure	:	101.0 kPa

The range from 9 kHz to 26 GHz was investigated, and except for the range shown in the attached appendix no emissions were found. The test was applied on both horizontal and vertical orientation. Refer to Appendix 1 for detailed test plot.



### 5.1.3 99% Bandwidth

**RESULT:****Passed**

Date of testing : 2011-01-20  
Test standard : RSS-Gen clause 4.6.1  
Basic standard : ANSI C63.10: 2009  
Kind of test site : Shielded room

**Test setup**

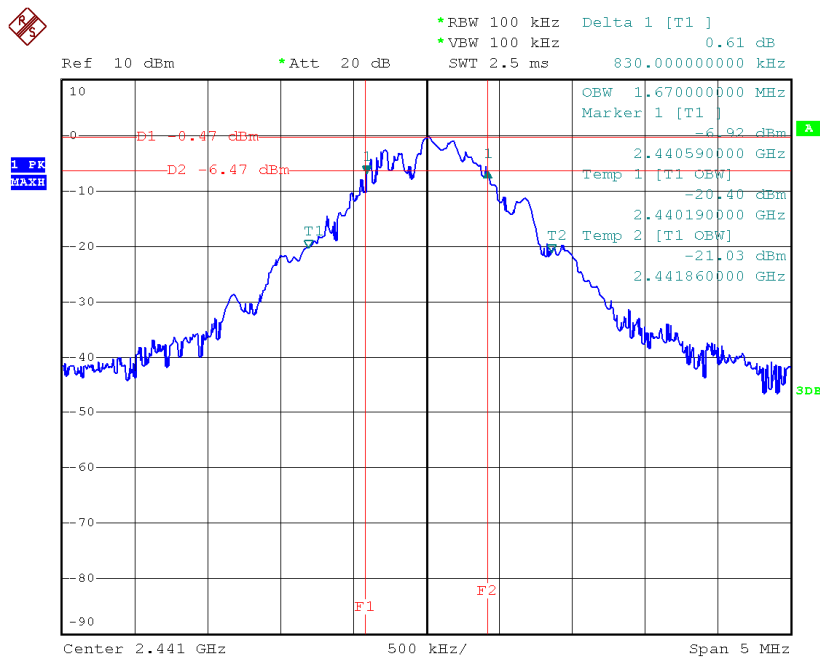
Test Channel : Low/ Middle/ High  
Operation Mode : A  
Ambient temperature : 20°C  
Relative humidity : 58%  
Atmospheric pressure : 101.0 kPa

**Table 6: Test result of 99% Bandwidth**

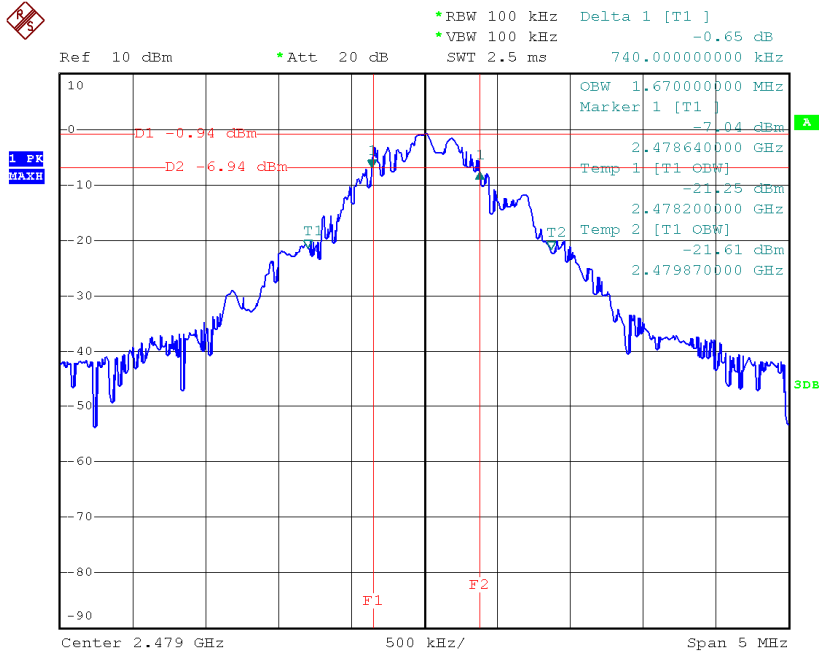
Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)	Limit (MHz)
Low Channel	2402	2.3	/
Mid Channel	2441	1.67	/
High Channel	2479	1.67	/

**Test Plots of 99% Bandwidth**
**Low Channel**


Date: 20.JAN.2011 18:24:52

**Middle Channel**


Date: 20.JAN.2011 18:31:22

**High Channel**


Date: 20.JAN.2011 18:19:17

### 5.1.4 Band Edge

**RESULT:**
**Passed**

Date of testing : 2011-01-19  
 Test standard : FCC part 15.249(d)  
                   : RSS-210 A2.9(b)  
 Basic standard : ANSI C63.10: 2009  
 Limit : FCC part 15.249(d)  
           : RSS-210 A2.9(b)  
 Kind of test site : 3m Semi-Anechoic Chamber

**Test setup**

Test Channel : Low/ High  
 Operation mode : A  
 Ambient temperature : 23°C  
 Relative humidity : 50%  
 Atmospheric pressure : 101 kPa

**Table 7: Test results of Band Edge**

Frequency (MHz)	Field Strength of Band Edge					
	Reading Level (dBuV/m)		Limit (dBuV/m)		Antenna Polarization	Verdict
	Average	Peak	Average	Peak		
2390	14.94	54.10	54	74	Horizontal	Pass
	15.27	54.60	54	74	Vertical	Pass
2483.5	23.45	62.61	54	74	Horizontal	Pass
	31.54	61.70	54	74	Vertical	Pass

## 6. Safety Human exposure

### 6.1 Radio Frequency Exposure Compliance

#### 6.1.1 Electromagnetic Fields

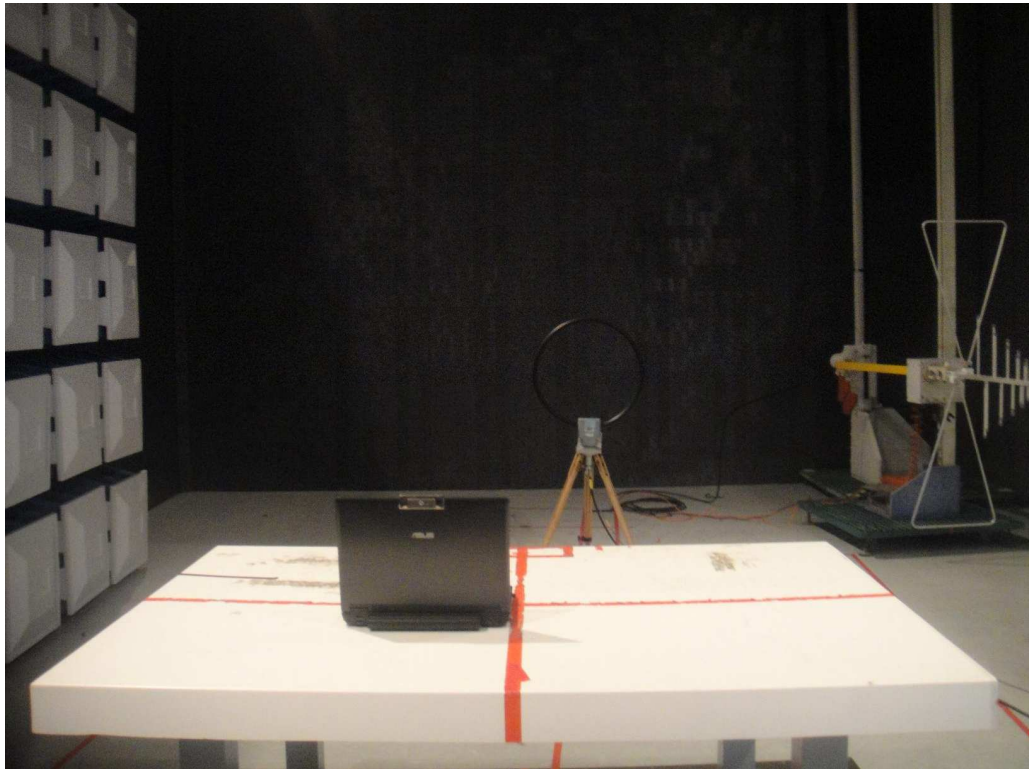
**RESULT:****Passed**

Since maximum peak output power of the transmitter is  $<60/f_{(\text{GHz})}\text{mW}$ , i.e.  $0.962\text{mW} < 25(=60/2.4)\text{mW}$ , hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile Portable RF Exposure.

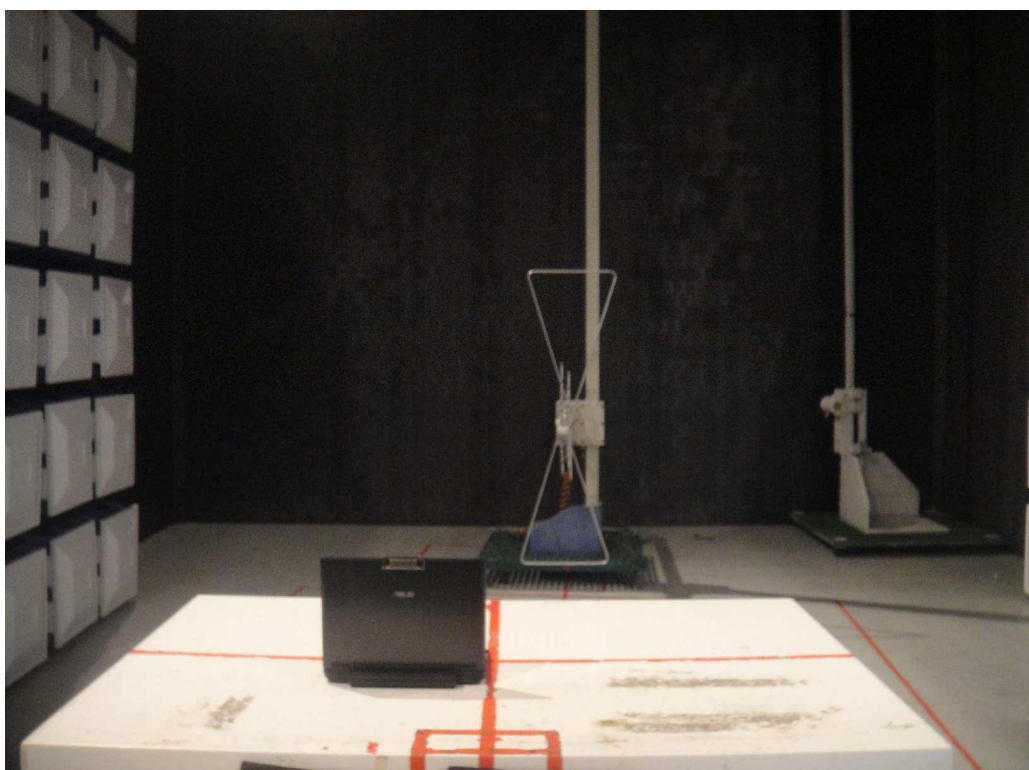
The measured peak output power of the transmitter is only 0.962mW. According to RSS-102 Issue 4 March 2010 clause 2.5, from 2.2 GHz up to 3 GHz inclusively and if the output power (i.e. the higher of the conducted or effective isotropic radiated power (e.i.r.p.) source-based time-averaged output power) is less than, or equal to 20 mW for General Public Use and 100 mW for Controlled Use, then the transmitters are exempt from routine SAR and RF exposure evaluations, therefore the EUT is deemed to fulfill the requirement without additional test.

## 7. Photographs of the Test Set-Up

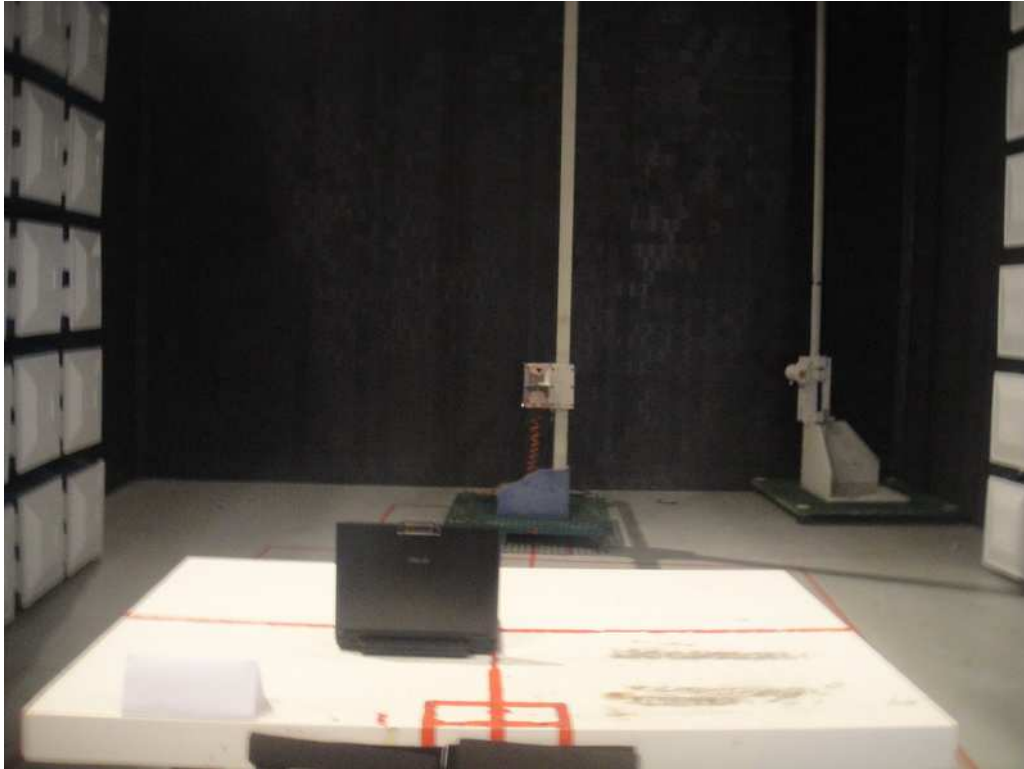
Photograph 1: Set-up for Radiated Emissions (9kHz - 30MHz)



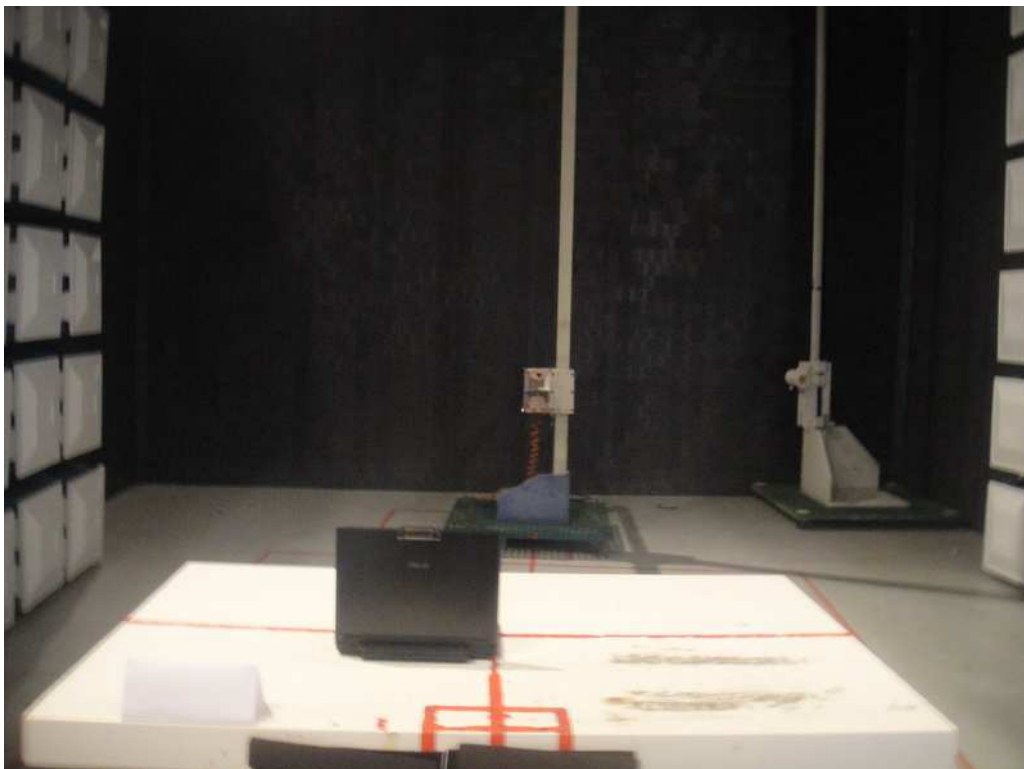
Photograph 2: Set-up for Radiated Emissions (30MHz-1GHz)



**Photograph 3: Set-up for Radiated Emissions (1GHz-18GHz)**



**Photograph 4: Set-up for Radiated Emissions (18GHz-26GHz)**



## 8. List of Tables

Table 1: List of Test and Measurement Equipment .....	5
Table 2: Measurement Uncertainty .....	6
Table 3: Information of EUT .....	7
Table 4: Technical Specification of EUT .....	7
Table 5: Test results of Field strength of fundamental .....	12
Table 6: Test result of 99% Bandwidth.....	17
Table 7: Test results of Band Edge .....	20

## 9. List of Photographs

Photograph 1: Set-up for Radiated Emissions (9kHz - 30MHz).....	22
Photograph 2: Set-up for Radiated Emissions (30MHz-1GHz).....	22
Photograph 3: Set-up for Radiated Emissions (1GHz-18GHz).....	23
Photograph 4: Set-up for Radiated Emissions (18GHz-26GHz).....	23



Produkte  
Products

Test Plots of Radiated emissions, mode A



Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

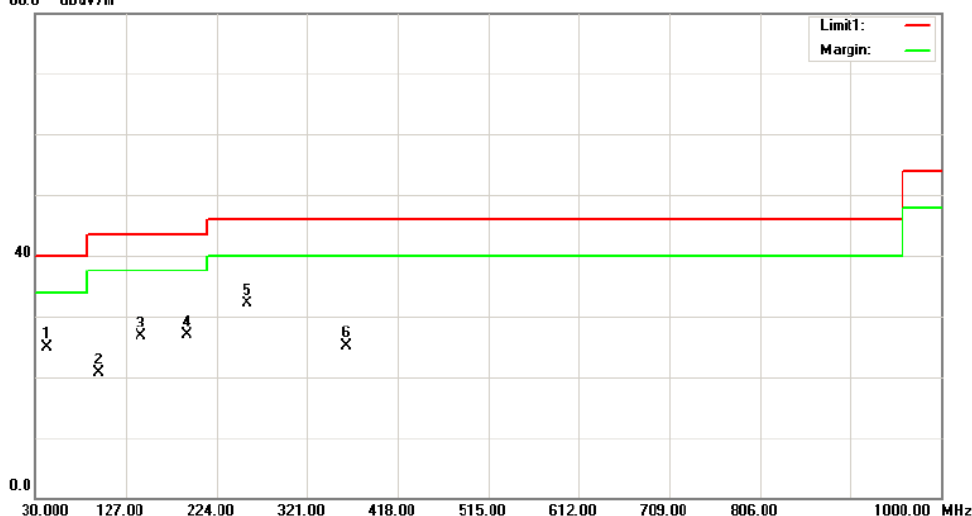
Radiated Emission Measurement

File :Dongle  
80.0 dBuV/m

Data :#13

Date: 2011-1-24

Time: 16:36:28



Site DG-CB03

Polarization: **Vertical**

Temperature: 23

Limit: FCC Class B 3M Radiation

Power: DC 5V

Humidity: 58 %

EUT: dongle

Distance: 3m

M/N:

Mode: TX

Note: TX 2402MHz

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	42.7800	41.67	-16.78	24.89	40.00	-15.11	peak	
2	98.1000	39.22	-18.44	20.78	43.50	-22.72	peak	
3	143.7600	44.44	-17.67	26.77	43.50	-16.73	peak	
4	192.4500	43.66	-16.69	26.97	43.50	-16.53	peak	
5 *	257.1000	46.15	-14.05	32.10	46.00	-13.90	peak	
6	362.7800	35.56	-10.37	25.19	46.00	-20.81	peak	

\*:Maximum data x:Over limit l:over margin

(Reference Only)

**Produkte**  
 Products



Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
 http://www.btl.org.cn

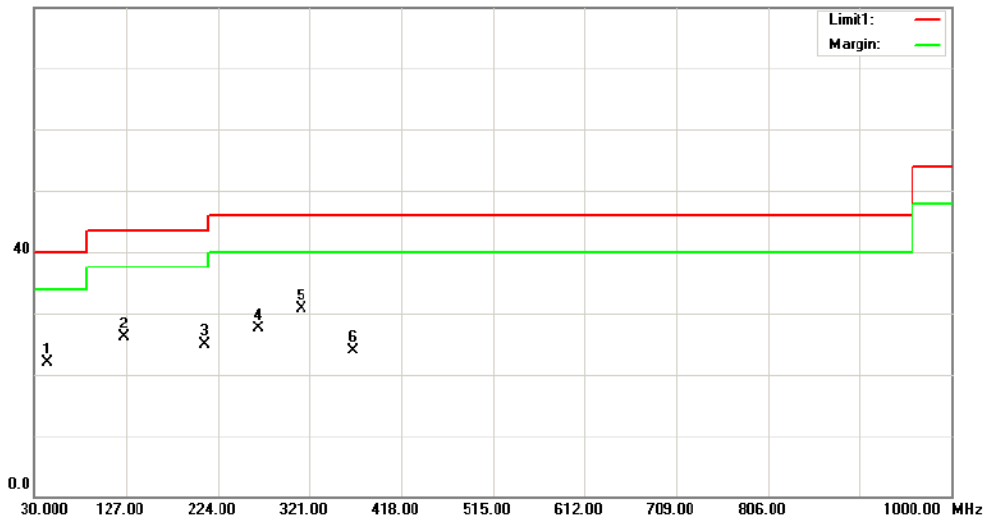
**Radiated Emission Measurement**

File :Dongle  
 80.0 dBuV/m

Data :#14

Date: 2011-1-24

Time: 16:40:04



Site DG-CB03

Polarization: **Horizontal**

Temperature: 23

Limit: FCC Class B 3M Radiation

Power: DC 5V

Humidity: 58 %

EUT: dongle

Distance: 3m

M/N:

Mode: TX

Note: TX 2402MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		43.7700	38.81	-16.90	21.91	40.00	-18.09	peak	
2		125.6700	44.31	-18.19	26.12	43.50	-17.38	peak	
3		210.5700	41.19	-16.29	24.90	43.50	-18.60	peak	
4		266.7900	40.98	-13.46	27.52	46.00	-18.48	peak	
5	*	312.9600	42.53	-11.75	30.78	46.00	-15.22	peak	
6		367.1100	34.12	-10.21	23.91	46.00	-22.09	peak	

\*:Maximum data x:Over limit l:over margin

<Reference Only

File :Dongle\Data :#14

Page: 1

Engineer Signature:

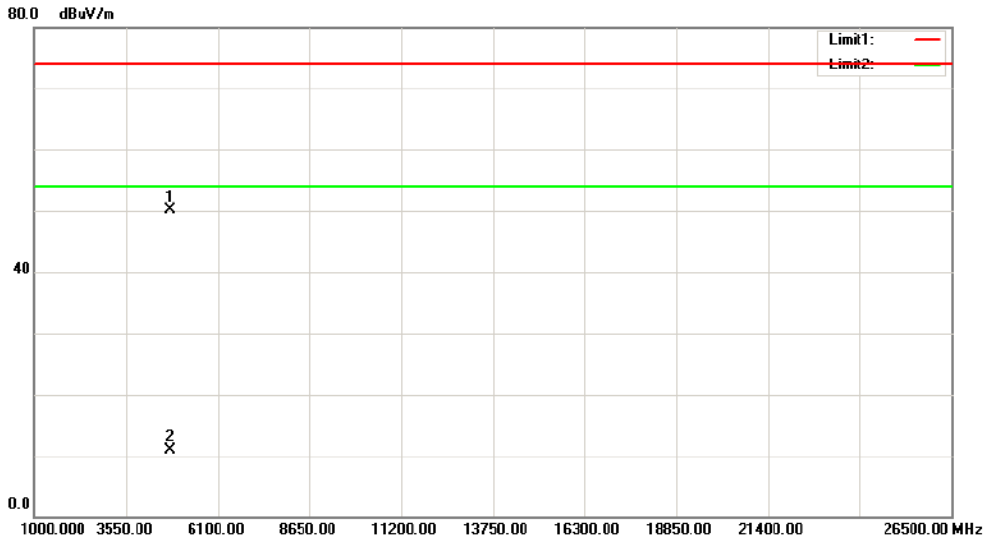


Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

**Radiated Emission Measurement**

File :Dongle                      Data :#12                      Date: 2011-1-19                      Time: 6:24:07



Site DG-CB03                      Polarization: **Vertical**                      Temperature: 23  
Limit: FCC\_RF\_1G-40G\_(Peak)                      Power: DC 5V                      Humidity: 58 %  
EUT: dongle                      Distance: 3m  
M/N:  
Mode: TX  
Note: TX 2402MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4804.570	44.85	5.21	50.06	74.00	-23.94	peak	
2		4804.570	5.69	5.21	10.90	54.00	-43.10	AVG	

\*:Maximum data    x:Over limit    !:over margin                      <Reference Only

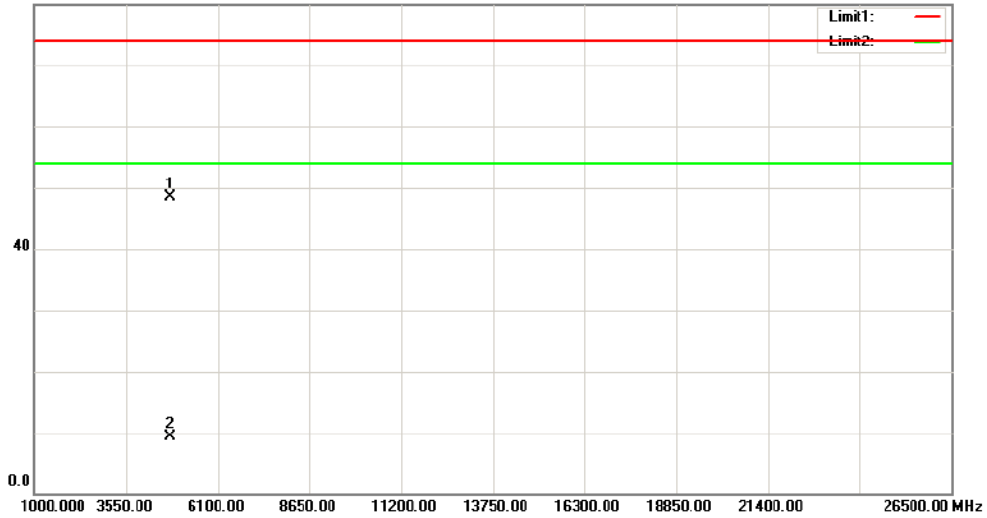


Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

**Radiated Emission Measurement**

File :Dongle Data :#11 Date: 2011-1-19 Time: 6:23:38  
80.0 dBuV/m



Site DG-CB03 Polarization: **Horizontal** Temperature: 23  
Limit: FCC\_RF\_1G-40G\_(Peak) Power: DC 5V Humidity: 58 %  
EUT: dongle Distance: 3m  
M/N:  
Mode: TX  
Note: TX 2402MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4804.570	43.28	5.21	48.49	74.00	-25.51	peak	
2		4804.570	4.12	5.21	9.33	54.00	-44.67	AVG	

\*:Maximum data x:Over limit !:over margin

<Reference Only



Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

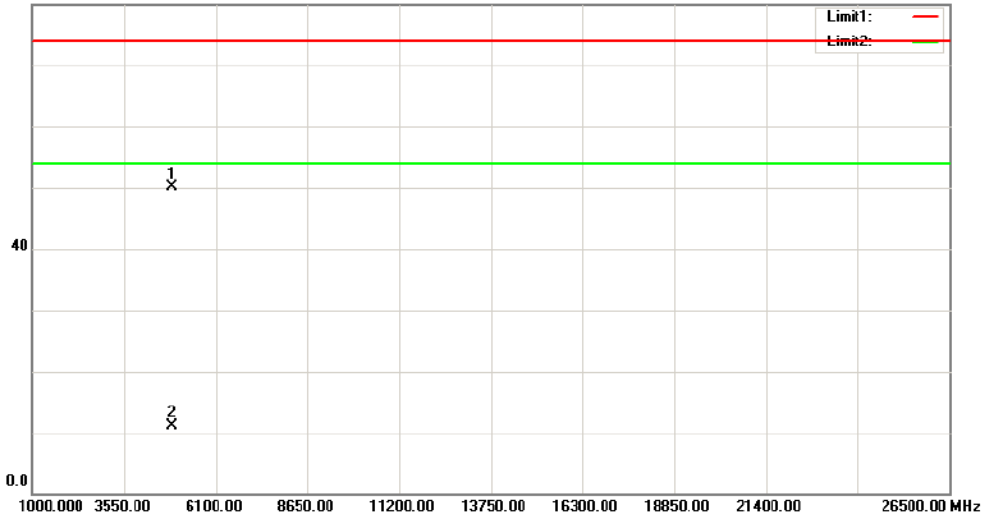
**Radiated Emission Measurement**

File :Dongle  
80.0 dBuV/m

Data :#10

Date: 2011-1-19

Time: 6:23:21



Site DG-CB03

Polarization: **Horizontal**

Temperature: 23

Limit: FCC\_RF\_1G-40G\_(Peak)

Power: DC 5V

Humidity: 58 %

EUT: dongle

Distance: 3m

M/N:

Mode: TX

Note: TX 2441MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.320	44.67	5.50	50.17	74.00	-23.83	peak	
2		4882.320	5.51	5.50	11.01	54.00	-42.99	AVG	

\*:Maximum data x:Over limit !:over margin

<Reference Only

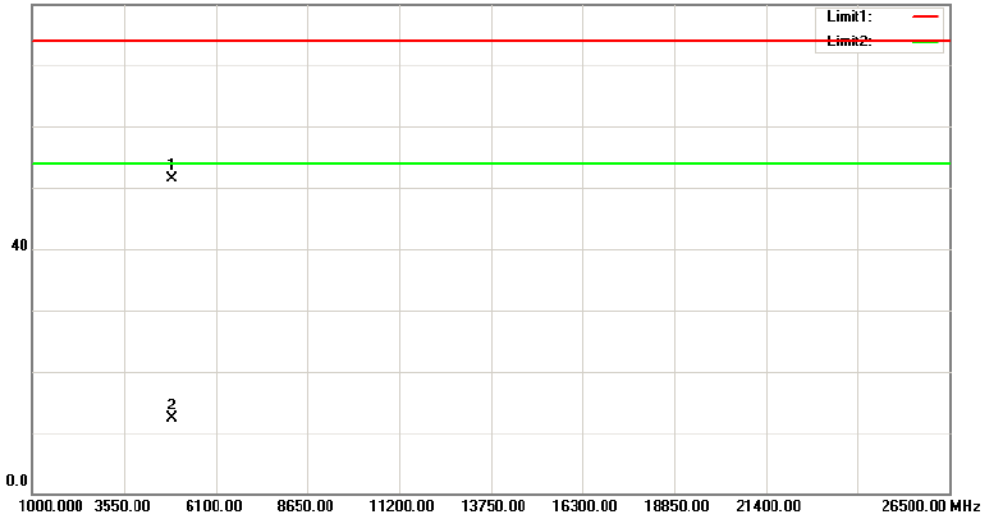


Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

**Radiated Emission Measurement**

File :Dongle Data :#9 Date: 2011-1-19 Time: 6:22:39  
80.0 dBuV/m



Site DG-CB03 Polarization: **Vertical** Temperature: 23  
Limit: FCC\_RF\_1G-40G\_(Peak) Power: DC 5V Humidity: 58 %  
EUT: dongle Distance: 3m  
M/N:  
Mode: TX  
Note: TX 2441MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4882.320	45.92	5.50	51.42	74.00	-22.58	peak	
2		4882.320	6.76	5.50	12.26	54.00	-41.74	AVG	

\*:Maximum data x:Over limit !:over margin

<Reference Only



Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

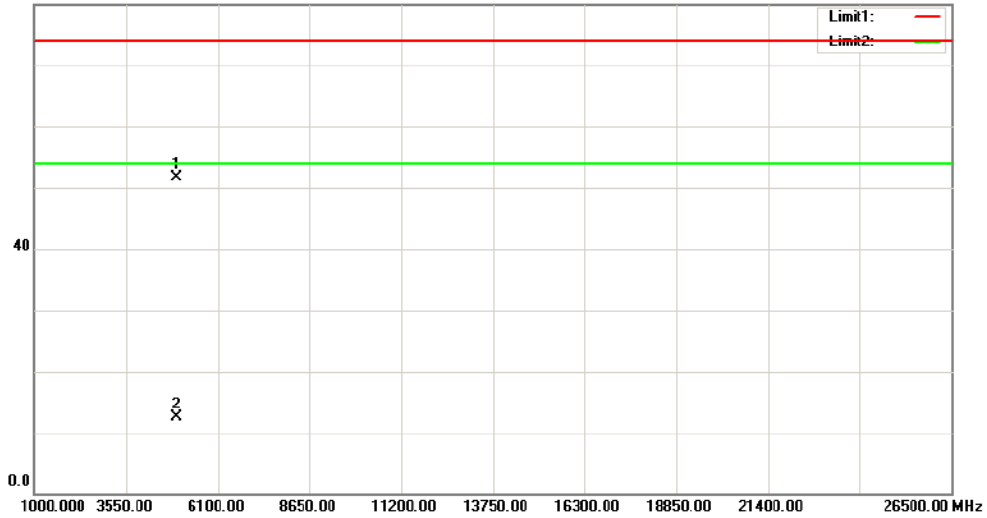
**Radiated Emission Measurement**

File :Dongle  
80.0 dBuV/m

Data :#8

Date: 2011-1-19

Time: 6:21:21



Site DG-CB03

Polarization: **Vertical**

Temperature: 23

Limit: FCC\_RF\_1G-40G\_(Peak)

Power: DC 5V

Humidity: 58 %

EUT: dongle

Distance: 3m

M/N:

Mode: TX

Note: TX 2479MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4958.160	46.01	5.78	51.79	74.00	-22.21	peak	
2		4958.160	6.82	5.78	12.60	54.00	-41.40	AVG	

\*:Maximum data x:Over limit l:over margin

<Reference Only

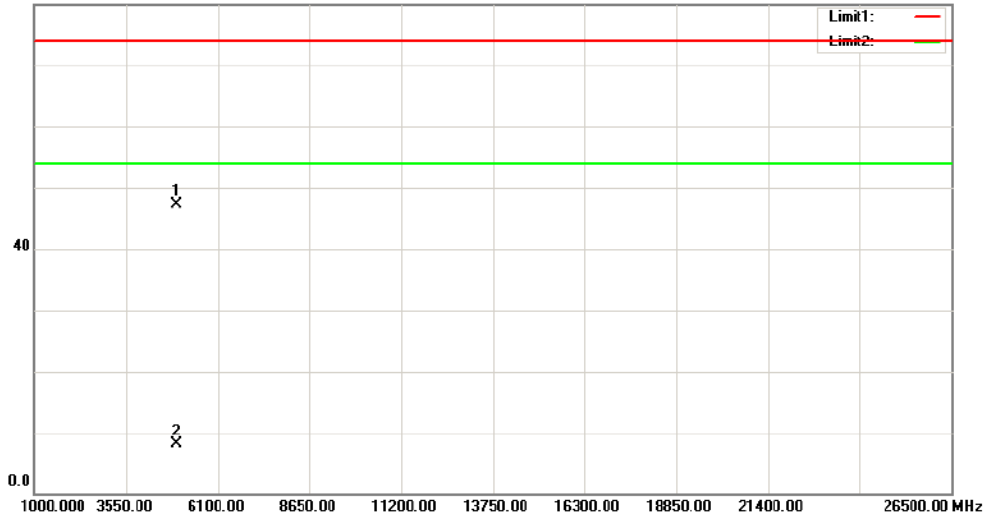


Neutron  
Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
http://www.btl.org.cn

**Radiated Emission Measurement**

File :Dongle Data :#7 Date: 2011-1-19 Time: 6:19:56  
80.0 dBuV/m



Site DG-CB03 Polarization: **Horizontal** Temperature: 23  
Limit: FCC\_RF\_1G-40G\_(Peak) Power: DC 5V Humidity: 58 %  
EUT: dongle Distance: 3m  
M/N:  
Mode: TX  
Note: TX 2479MHz

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4957.640	41.49	5.78	47.27	74.00	-26.73	peak	
2		4957.640	2.33	5.78	8.11	54.00	-45.89	AVG	

\*:Maximum data x:Over limit l:over margin

<Reference Only



Test Plots of Spurious radiations, mode C



Neutron Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

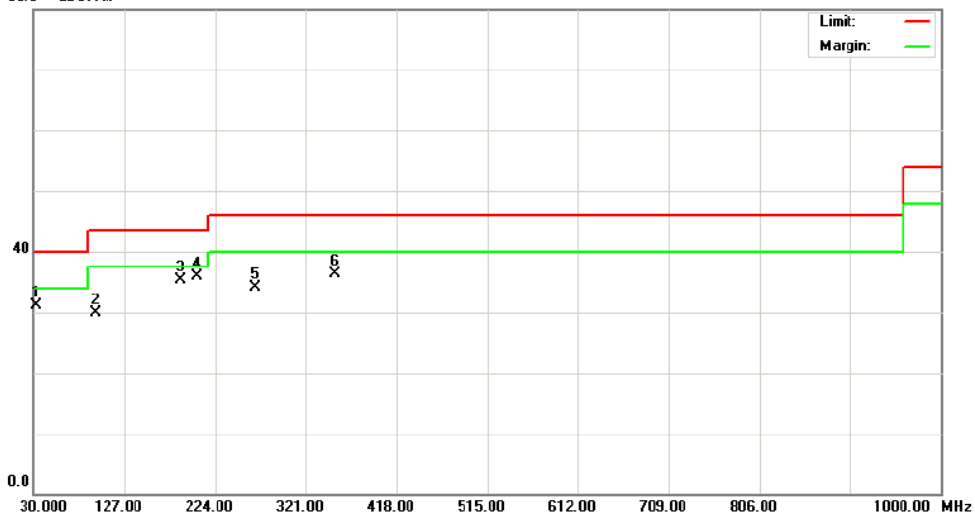
Radiated Emission Measurement

File :DONGLE  
80.0 dBuV/m

Data :#13

Date: 2011-1-21

Time: 14:49:12



Site DG-CB03  
Limit: FCC Class B 3M Radiation  
EUT: Lenovo 2.4G Wireless dongle  
M/N:  
Mode: RX  
Note: RX 2402

Polarization: **Vertical**  
Power: AC 120V/60Hz  
Distance: 3m

Temperature: 23  
Humidity: 51 %

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	32.5700	47.66	-16.52	31.14	40.00	-8.86	peak	
2	95.6100	48.35	-18.48	29.87	43.50	-13.63	peak	
3	186.2500	52.05	-16.80	35.25	43.50	-8.25	peak	
4 *	205.5700	52.37	-16.42	35.95	43.50	-7.55	peak	
5	266.7100	47.61	-13.46	34.15	46.00	-11.85	peak	
6	351.1200	47.05	-10.80	36.25	46.00	-9.75	peak	

\*:Maximum data x:Over limit l:over margin

(Reference Only)

**Produkte**  
 Products



Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

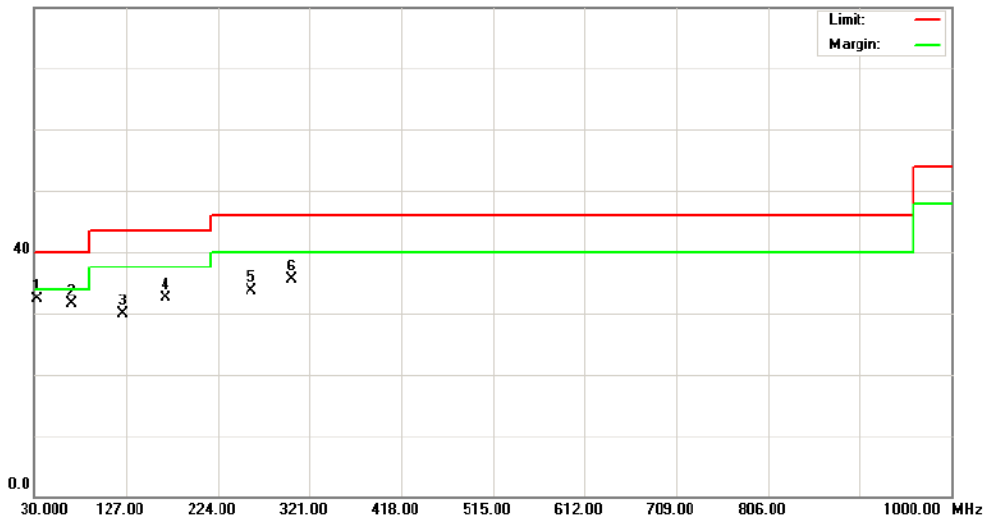
**Radiated Emission Measurement**

File :DONGLE  
 80.0 dBuV/m

Data :#14

Date: 2011-1-21

Time: 14:50:58



Site DG-CB03

Polarization: **Horizontal**

Temperature: 23

Limit: FCC Class B 3M Radiation

Power: AC 120V/60Hz

Humidity: 51 %

EUT: Lenovo 2.4G Wireless dongle

Distance: 3m

M/N:

Mode: RX

Note: RX 2402

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	32.5700	48.77	-16.52	32.25	40.00	-7.75	peak	
2		68.9500	49.76	-18.19	31.57	40.00	-8.43	peak	
3		123.5900	48.13	-18.22	29.91	43.50	-13.59	peak	
4		168.6700	49.88	-17.34	32.54	43.50	-10.96	peak	
5		258.1400	47.63	-13.98	33.65	46.00	-12.35	peak	
6		302.1500	47.62	-12.02	35.60	46.00	-10.40	peak	

\*:Maximum data x:Over limit l:over margin

⟨Reference Only

**Produkte**  
 Products

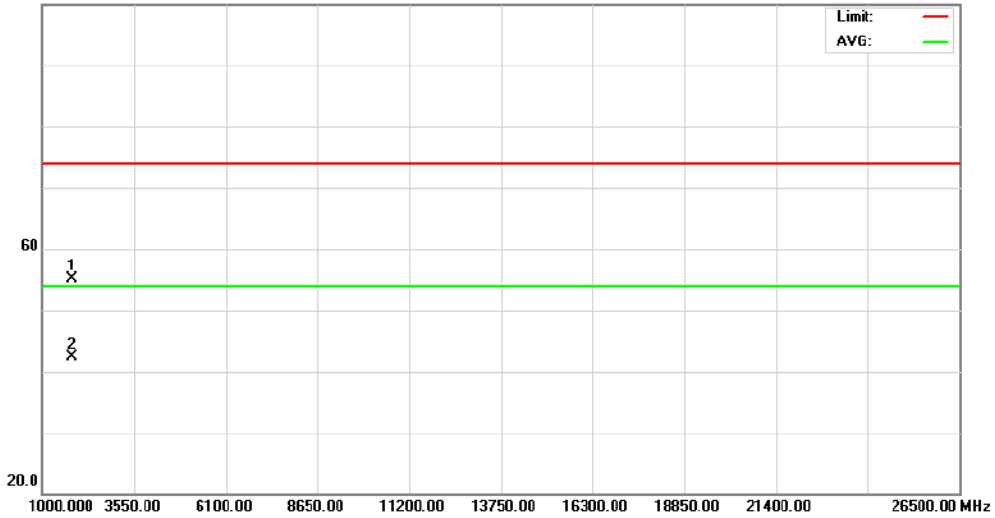


Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

**Radiated Emission Measurement**

File :DONGLE Data :#15 Date: 2011-1-21 Time: 14:56:59  
 100.0 dBuV/m



Site DG-CB03 Polarization: **Vertical** Temperature: 23  
 Limit: FCC\_RF\_1G-40G\_(Peak) Power: AC 120V/60Hz Humidity: 58 %  
 EUT: Lenovo 2.4G Wireless dongle Distance: 3m  
 M/N:  
 Mode: RX  
 Note: RX 2402

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1768.210	58.31	-3.19	55.12	74.00	-18.88	peak	
2	*	1768.210	45.54	-3.19	42.35	54.00	-11.65	AVG	

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

**Produkte**  
 Products



Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

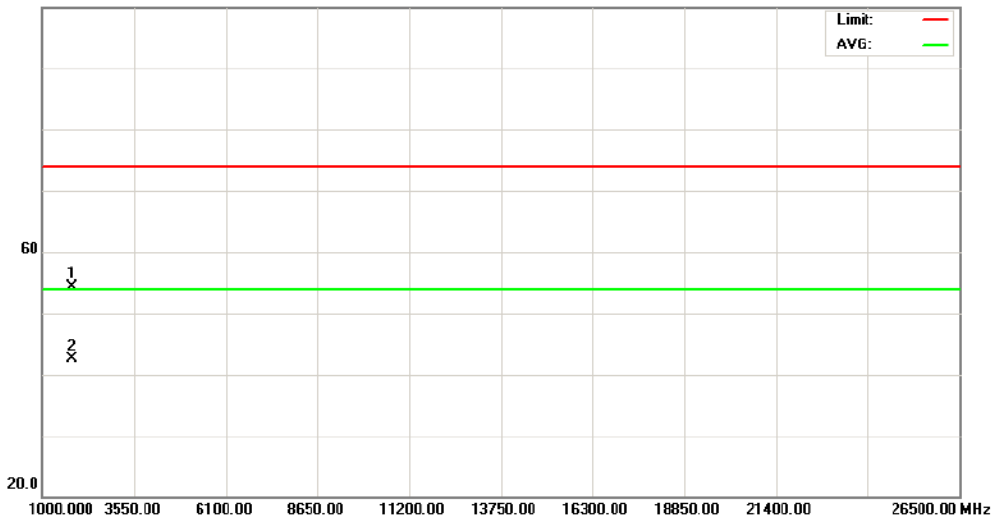
**Radiated Emission Measurement**

File :DONGLE  
 100.0 dBuV/m

Data :#16

Date: 2011-1-21

Time: 14:58:21



Site DG-CB03

Polarization: **Horizontal**

Temperature: 23

Limit: FCC\_RF\_1G-40G\_(Peak)

Power: AC 120V/60Hz

Humidity: 58 %

EUT: Lenovo 2.4G Wireless dongle

Distance: 3m

M/N:

Mode: RX

Note: RX 2402

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1768.210	57.42	-3.19	54.23	74.00	-19.77	peak	
2	*	1768.210	45.72	-3.19	42.53	54.00	-11.47	AVG	

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

**Produkte**  
 Products



Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

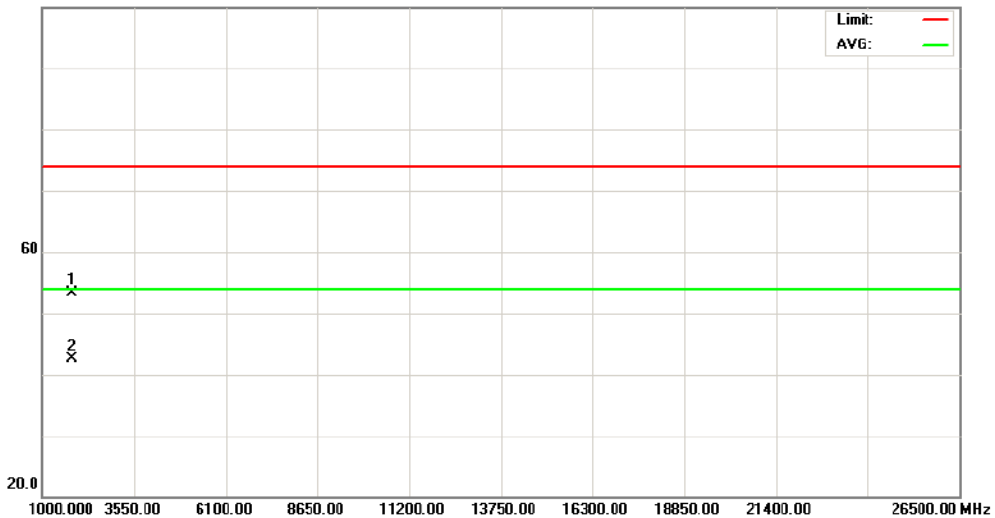
**Radiated Emission Measurement**

File :DONGLE  
 100.0 dBuV/m

Data :#17

Date: 2011-1-21

Time: 15:01:12



Site DG-CB03

Polarization: **Vertical**

Temperature: 23

Limit: FCC\_RF\_1G-40G\_(Peak)

Power: AC 120V/60Hz

Humidity: 58 %

EUT: Lenovo 2.4G Wireless dongle

Distance: 3m

M/N:

Mode: RX

Note: RX 2441

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1783.120	56.36	-3.12	53.24	74.00	-20.76	peak	
2	*	1783.120	45.69	-3.12	42.57	54.00	-11.43	AVG	

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

**Produkte**  
 Products

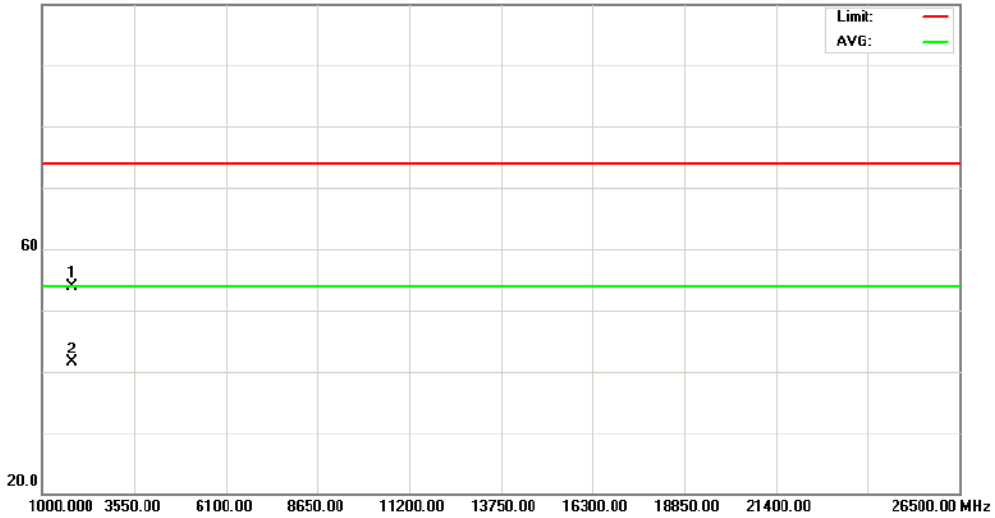


Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

**Radiated Emission Measurement**

File :DONGLE Data :#18 Date: 2011-1-21 Time: 15:03:33  
 100.0 dBuV/m



Site DG-CB03 Polarization: **Horizontal** Temperature: 23  
 Limit: FCC\_RF\_1G-40G\_(Peak) Power: AC 120V/60Hz Humidity: 58 %  
 EUT: Lenovo 2.4G Wireless dongle Distance: 3m  
 M/N:  
 Mode: RX  
 Note: RX 2441

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		1783.120	56.98	-3.12	53.86	74.00	-20.14	peak	
2	*	1783.120	44.69	-3.12	41.57	54.00	-12.43	AVG	

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

**Produkte**  
 Products



Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

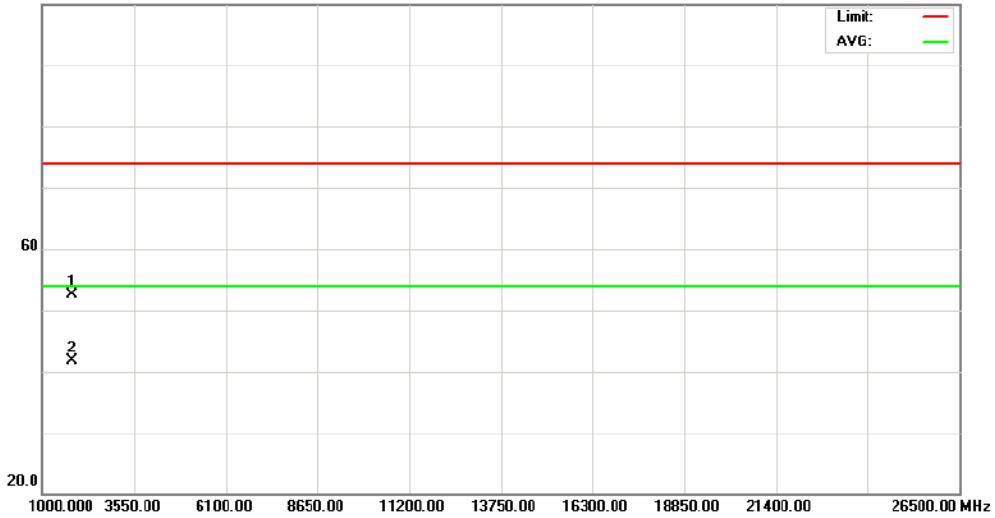
**Radiated Emission Measurement**

File :DONGLE  
 100.0 dBuV/m

Data :#19

Date: 2011-1-21

Time: 15:05:51



Site DG-CB03

Polarization: **Vertical**

Temperature: 23

Limit: FCC\_RF\_1G-40G\_(Peak)

Power: AC 120V/60Hz

Humidity: 58 %

EUT: Lenovo 2.4G Wireless dongle

Distance: 3m

M/N:

Mode: RX

Note: RX 2479

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1822.140	55.49	-2.92	52.57	74.00	-21.43	peak	
2	*	1822.140	44.60	-2.92	41.68	54.00	-12.32	AVG	

\*:Maximum data x:Over limit !:over margin

⟨Reference Only

**Produkte**  
 Products

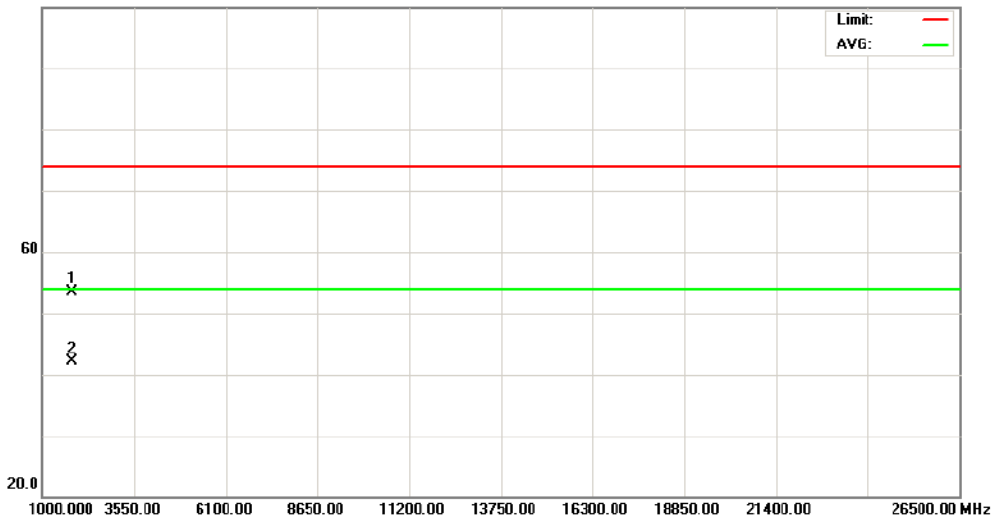


Neutron  
 Engineering Inc.

No.3.JinShaGang 1st Road,ShiXia,DaLang Town,DongGuan,China.  
 Tel: (0769)-8318-3000 Fax:(0769)-8319-6000 Post Code: 523792  
<http://www.btl.org.cn>

**Radiated Emission Measurement**

File :DONGLE      Data :#20      Date: 2011-1-21      Time: 15:07:38  
 100.0 dBuV/m



Site DG-CB03      Polarization: **Horizontal**      Temperature: 23  
 Limit: FCC\_RF\_1G-40G\_(Peak)      Power: AC 120V/60Hz      Humidity: 58 %  
 EUT: Lenovo 2.4G Wireless dongle      Distance: 3m  
 M/N:  
 Mode: RX  
 Note: RX 2479

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1822.140	56.49	-2.92	53.57	74.00	-20.43	peak	
2	*	1822.140	44.94	-2.92	42.02	54.00	-11.98	AVG	

\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only