Neutron Engineering Inc.



# FCC Radio Test Report

## FCC ID: T58NW3212008R1

This report concerns (check one) : Original Grant Class II Change

Issued Date	: Jun. 27, 2008
Project No.	:0806C101
Equipment	: 802.11g 54Mbps Wireless LAN PCI Adapter
Model Name	: NW321
Applicant	Netcore Technology INC.
Address	9F,B Block,Research&Development Building, Tsing Hua Information Park,High-Tech Industrial Park North Section,Nanshan,

Shenzhen, China

Tested by:

Neutron Engineering Inc. EMC Laboratory Date of Test: Jun. 16, 2008 ~ Jun. 26, 2008

Testing Engineer

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Authorized Signatory

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Report No.: NEI-FCCP-1-0806C101



#### Declaration

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Table of Contents	Page
1. CERTIFICATION	5
2 . SUMMARY OF TEST RESULTS	6
2.1 TEST FACILITY	7
2.2 MEASUREMENT UNCERTAINTY	7
3 . GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	10
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	10
3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTE	D 11
3.5 DESCRIPTION OF SUPPORT UNITS	12
4 . EMC EMISSION TEST	13
4.1 CONDUCTED EMISSION MEASUREMENT	13
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	13
4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING 4.1.3 TEST PROCEDURE	13 14
4.1.4 DEVIATION FROM TEST STANDARD	14
4.1.5 TEST SETUP	14
4.1.6 EUT OPERATING CONDITIONS 4.1.7 TEST RESULTS	14 15
4.1.7 TEST RESULTS 4.2 RADIATED EMISSION MEASUREMENT	13
4.2.1 RADIATED EMISSION MEASUREMENT 4.2.1 RADIATED EMISSION LIMITS	17
4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING	18
4.2.3 TEST PROCEDURE	19
4.2.4 DEVIATION FROM TEST STANDARD 4.2.5 TEST SETUP	19 20
4.2.6 EUT OPERATING CONDITIONS	20
4.2.7 TEST RESULTS (BETWEEN30 – 1000 MHZ)	21
4.2.8 TEST RESULTS (ABOVE 1000 MHZ)	25
4.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)	49
5. BANDWIDTH TEST	57
5.1 APPLIED PROCEDURES / LIMIT 5.1.1 MEASUREMENT INSTRUMENTS LIST	57 57
5.1.2 TEST PROCEDURE	57 57
5.1.3 DEVIATION FROM STANDARD	57
5.1.4 TEST SETUP	58
5.1.5 EUT OPERATION CONDITIONS	58

Neutron Engineering Inc.



Table of Contents	Page
5.1.6 TEST RESULTS	59
6 . PEAK OUTPUT POWER TEST	63
6.1 APPLIED PROCEDURES / LIMIT	63
6.1.1 MEASUREMENT INSTRUMENTS LIST	63
6.1.2 TEST PROCEDURE	63
6.1.3 DEVIATION FROM STANDARD	63
6.1.4 TEST SETUP	63
6.1.5 EUT OPERATION CONDITIONS	63
6.1.6 TEST RESULTS	64
7 . ANTENNA CONDUCTED SPURIOUS EMISSION	65
7.1 APPLIED PROCEDURES / LIMIT	65
7.1.1 MEASUREMENT INSTRUMENTS LIST	65
7.1.2 TEST PROCEDURE	65
7.1.3 DEVIATION FROM STANDARD	65
7.1.4 TEST SETUP	65
7.1.5 EUT OPERATION CONDITIONS	66
7.1.6 TEST RESULTS	67
8 . POWER SPECTRAL DENSITY TEST	71
8.1 APPLIED PROCEDURES / LIMIT	71
8.1.1 MEASUREMENT INSTRUMENTS LIST	71
8.1.2 TEST PROCEDURE	71
8.1.3 DEVIATION FROM STANDARD	71
8.1.4 TEST SETUP	71
8.1.5 EUT OPERATION CONDITIONS	71
8.1.6 TEST RESULTS	72
9 . RF EXPOSURE TEST	76
9.1 APPLIED PROCEDURES / LIMIT	76
9.1.1 MPE CALCULATION METHOD	76
9.1.2 DEVIATION FROM STANDARD	76
9.1.3 EUT OPERATION CONDITIONS	76
9.1.4 TEST RESULTS	77
10 . EUT TEST PHOTO	78



## **1. CERTIFICATION**

Equipment: 802.11g 54Mbps Wireless LAN PCI Adapter Trade Name: N/A Model Name: NW321 Applicant: Netcore Technology INC. Date of Test: Jun. 16, 2008 ~ Jun. 26, 2008 Test Item: ENGINEERING SAMPLE Standards: FCC Part15, Subpart C(15.247) / ANCI C63.4 : 2003

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-0806C101) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

## Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C					
Standard Section	Test Item	Judgment	Remark		
15.207	Conducted Emission	PASS			
15.247 (c)	Antenna conducted Spurious Emission	PASS			
15.247 (a)(2)	6dB Bandwidth	PASS			
15.247 (b)	Peak Output Power	PASS			
15.247 (c)	Radiated Spurious Emission	PASS			
15.247 (d)	Power Spectral Density	PASS			
15.203	Antenna Requirement	PASS			
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	PASS			

## NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **C01/OS02** at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan. Neutron's test firm number is 95335

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y  $\pm$  U  $_{\rm 2}$  where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of ~ k=2  $_{\rm 2}$  providing a level of confidence of approximately 95 %  $_{\rm 2}$ 

#### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	1.94	

#### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	Н	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	Н	3.94	
OS-02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	Н	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	Н	2.66	





## **3. GENERAL INFORMATION**

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	802.11g 54Mbps Wireles	ss LAN PCI Adapter		
Trade Name	N/A			
Model Name	NW321			
OEM Brand/Model Name	N/A			
Model Difference	N/A			
Product Description	Operation Frequency:         Product Class:         Receiver Class:         Modulation Type:         Bit Rate of Transmitter         Number Of Channel         Antenna Designation:         Antenna Gain(Peak)         Output Power:         Based on the application         ITE/Computing Device.         specification, please refer	More details of EUT technical er to the User's Manual.		
Channel List	Please refer to the Note 2.			
Power Source	DC Voltage supplied from System			
Power Rating	I/P AC 120V/60Hz , O/P DC 5V			
Connecting I/O Port(s)	Please refer to the User's Manual			
Products Covered	N/A			

#### Note

2

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

#### 3

#### . Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	FRE	E421X-2000A1	Dipole Antenna	R-SMA	2.0



#### **3.2 DESCRIPTION OF TEST MODES**

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX CH01
Mode 2	TX CH06
Mode 3	TX CH11

For Conducted Test		
Final Test Mode	Description	
Mode 4	Normal Link with Router	

For Radiated Test		
Final Test Mode	Description	
Mode 1	TX CH01	
Mode 2	TX CH06	
Mode 3	TX CH11	

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

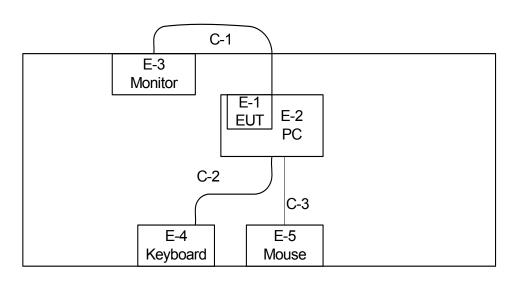
#### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN

Test software Version	Test Program: Realtek RTL8185			
Frequency	2412 MHz	2437 MHz	2462 MHz	
IEEE 802.11b DSSS	6	6	6	
IEEE 802.11g OFDM	17	17	17	



## 3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 VGA Cable C-2 Data Cable C-3 Data Cable



## **3.5 DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	802.11g 54Mbps Wireless LAN PCI Adapter	N/A	NW321	T58NW3212008R1	N/A	EUT
E-2	PC	DELL	OPTIPLEX 320	DOC	7T390 A03	
E-3	Monitor	DELL	E177FPc	DOC	CN-0FJ179-64180-6AG-1PKS	
E-4	PS/2 K/B	IBM	KB-0225	DOC	0040125	
E-5	PS/2 Mouse	DELL	M-SBF69	DOC	HCA44601156	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.8M	
C-3	YES	NO	1.8M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in  $\[$  Length  $\]$  column.



## 4. EMC EMISSION TEST

## 4.1 CONDUCTED EMISSION MEASUREMENT

## 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A	(dBuV)	Class B	Standard	
FREQUENCT (MITZ)	Quasi-peak	Average	Quasi-peak	Average	Stanuaru
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

## 4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00042991	Jan. 24, 2009
2	LISN	EMCO	3816/2	00042990	Jan. 24, 2009
3	Pulse Limiter	Electro-Metrics	EM-7600	112644	Nov. 27, 2008
4	50Ω Terminator	N/A	N/A	N/A	May.13, 2009
5	Test Cable	N/A	C01	N/A	Nov. 27, 2008
6	EMI Test Receiver	R&S	ESCI	100082	Mar. 07, 2009

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

#### The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



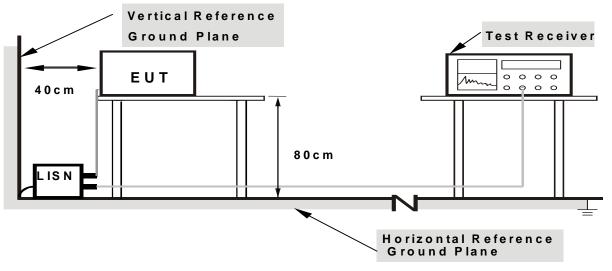
## 4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80

from other units and other metal planes

## 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

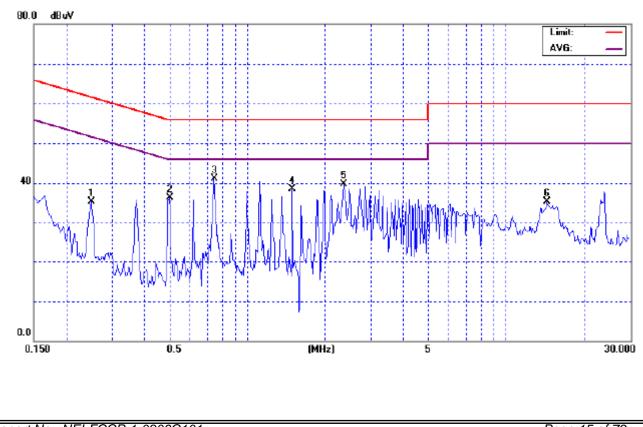


## 4.1.7 TEST RESULTS

EUT :		802 PC	2.11g 54Mbps I Adapter	Model Nam	e :	NW3	321		
Temperati	ure :	24	°C		Relative Hu	midity:	66%		
Pressure :		101	I0hPa		Test Power	:	AC 1	20V/60Hz	
Test Mode	9 :	Noi	rmal Link with	Router	·				
Freq.	Termir	nal	Measure	d(dBuV)	Limits(	(dBuV)		Margin	Note
(MHz)	L/N		QP-Mode	AV-Mode	QP-Mode	AV-Mo	bde	(dB)	NOLE
0.25	Line		35.31	*	61.76	51.7	6	-26.45	(QP)
0.50	Line		36.31	*	56.00	46.0	0	-19.69	(QP)
0.75	Line		41.11	*	56.00	46.0	0	-14.89	(QP)
1.50	Line		38.60	*	56.00	46.0	0	-17.40	(QP)
2.37	Line		39.75	*	56.00	46.0	0	-16.25	(QP)
14.43	Line		35.23	*	60.00	50.0	0	-24.77	(QP)

#### Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note ... If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform In this case, a "\*" marked in AVG Mode column of Interference Voltage Measured •
- (2) Measuring frequency range from 150KHz to 30MHz  $\circ$



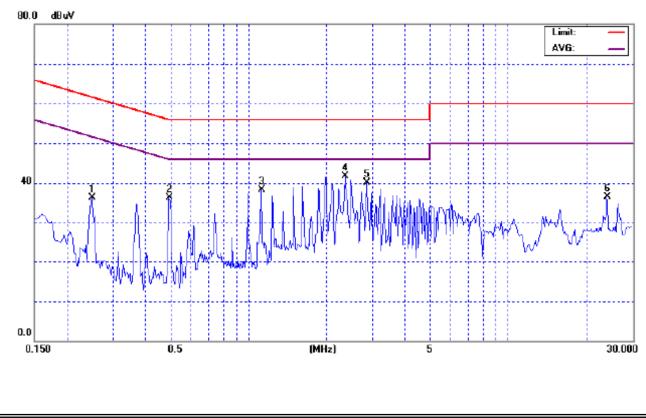
Report No.: NEI-FCCP-1-0806C101



EUT :		802.11g 54Mbps Wireless LAN PCI Adapter			Model Name :		NW321		
Temperatu	ure :	24	°C		Relative Hu	midity:	66%		
Pressure :		101	I0hPa		Test Power	:	AC 1	120V/60Hz	
Test Mode : Normal Link with Router									
Freq.	Termir	nal	Measure	d(dBuV)	Limits(	(dBuV)		Margin	Note
(MHz)	L/N		QP-Mode	AV-Mode	QP-Mode	AV-Mo	ode	(dB)	NULE
0.25	Neutr	al	36.34	*	61.76	51.7	6	-25.42	(QP)
0.50	Neutr	al	36.34	*	56.08	46.0	8	-19.74	(QP)
1.12	Neutr	al	38.35	*	56.00	46.0	0	-17.65	(QP)
2.36	Neutr	al	41.71	*	56.00	46.0	0	-14.29	(QP)
2.86	Neutr	al	40.04	*	56.00	46.0	0	-15.96	(QP)
24.13	Neutr	al	36.53	*	60.00	50.0	0	-23.47	(QP)

#### Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note ... If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform In this case, a "\*" marked in AVG Mode column of Interference Voltage Measured •
- (2) Measuring frequency range from 150KHz to 30MHz  ${\scriptstyle \circ}$





### 4.2 RADIATED EMISSION MEASUREMENT

#### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBu	V/m) (at 3m)	Class B (dBuV/m) (at 3m)		
	PEAK	AVERAGE	PEAK	AVERAGE	
Above 1000	80	60	74	54	

Notes:

(1) The limit for radiated test was performed according to FCC PART 15B.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



## 4.2.2 MEASUREMENT INSTRUMENTS LIST ANS SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3058	Nov. 27, 2008
2	Test Cable	N/A	10M_OS02	N/A	Nov. 27, 2008
3	Test Cable	N/A	OS02-1/-2/-3	N/A	Nov. 27, 2008
4	Pre-Amplifier	Anritsu	MH648A	M09961	Nov. 27, 2008
5	EMI Test Receiver	R&S	ESCI	100082	Jan. 30, 2009
6	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A
7	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
8	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009
9	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-325	Oct. 24, 2008
10	Horn Antenna	Schwarzbeck	BBHA9170	9170187	Oct. 24, 2008
11	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Mar. 09, 2009
12	Microflex Cable	United Microwave	57793	1m	Mar. 09, 2009
13	Microflex Cable	United Microwave	A30A30-500 6	10M	Jul. 07, 2008

Remark: " N/A" denotes No Model Name / Serial No. and No Calibration specified.

Auto 1000 MHz
10th carrier harmonic
1MHz / 1MHz for Peak
Peak value + 20 log (Duty cycle)
0KHz / 100KHz for peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



## 4.2.3 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

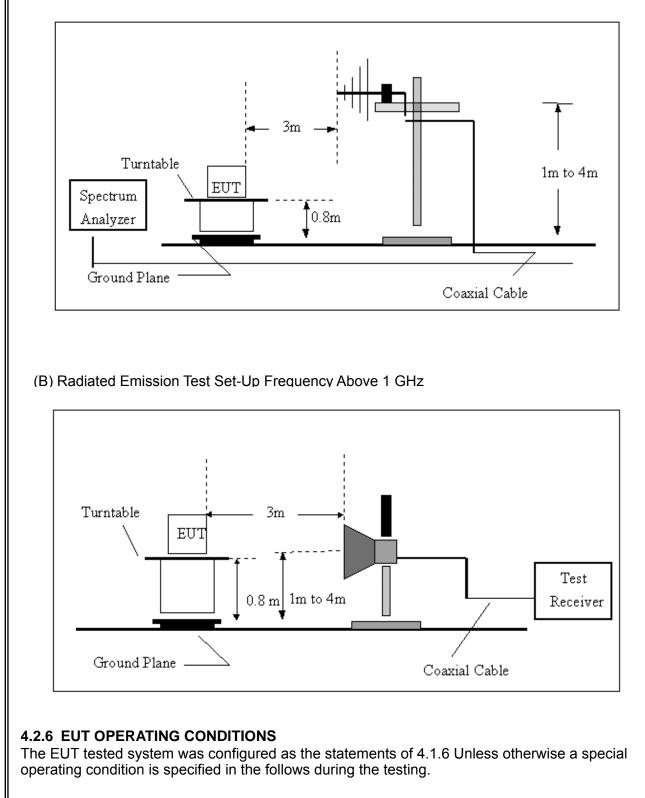
#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation



## 4.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



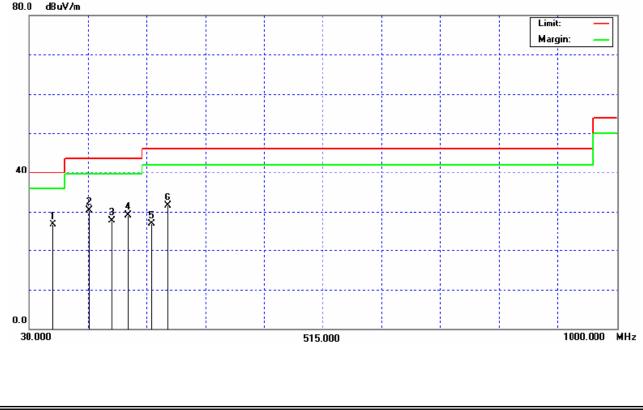


### 4.2.7 TEST RESULTS (BETWEEN30 - 1000 MHZ)

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321	
Temperature :	<b>25</b> ℃	Relative Humidity :	65%	
Pressure :	1010 hPa	AC 120V/60Hz		
Test Mode :	TX B MODE CHANNEL 2412MHz			

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
68.80	V	49.62	-22.95	26.67	40.00	- 13.33	
128.94	V	52.18	-21.95	30.23	43.50	- 13.27	
165.80	V	47.77	-20.10	27.67	43.50	- 15.83	
192.96	V	48.48	-19.47	29.01	43.50	- 14.49	
231.76	V	44.44	-17.59	26.85	46.00	- 19.15	
258.92	V	48.26	-16.69	31.57	46.00	- 14.43	

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ∘
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform •
- (3) Measuring frequency range from 30MHz to 1000MHz  $\,\circ\,$
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  ${}^{\circ}$

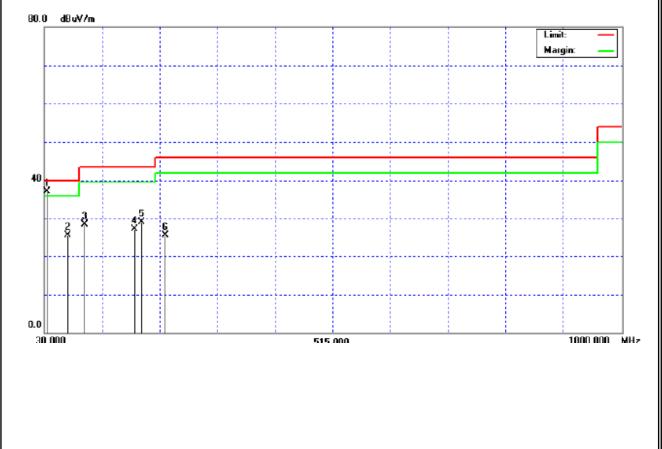




EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	AC 120V/60Hz			
Test Mode :	TX B MODE CHANNEL 2412MHz				

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
33.88	H	51.03	-13.87	37.16	40.00	- 2.84	
68.80	Н	48.69	-22.95	25.74	40.00	- 14.26	
97.90	Н	49.26	-20.81	28.45	43.50	- 15.05	
181.32	Н	46.86	-19.49	27.37	43.50	- 16.13	
192.96	Н	48.48	-19.47	29.01	46.00	- 14.49	
233.70	Н	43.18	-17.52	25.66	46.00	- 20.34	

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ∘
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform •
- (3) Measuring frequency range from 30MHz to 1000MHz  $\circ$
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  $\circ$

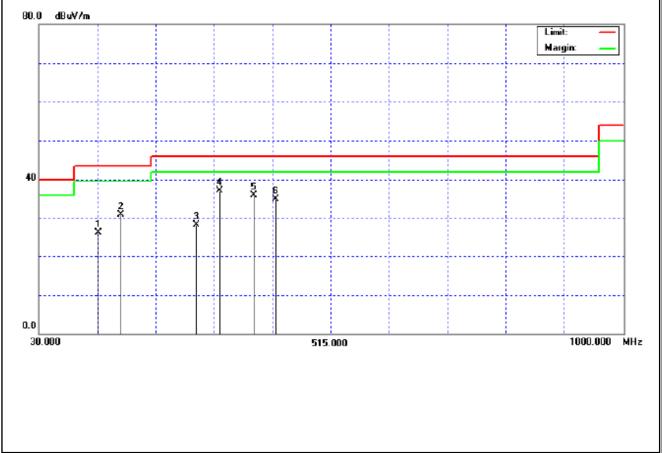




EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE CHANNEL 2412MHz				

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
128.62	V	48.21	-21.94	26.27	43.50	- 17.23	
165.48	V	51.03	-20.09	30.94	43.50	- 12.56	
291.90	V	43.73	-15.44	28.29	46.00	- 17.71	
330.70	V	50.81	-13.78	37.03	46.00	- 8.97	
386.96	V	48.59	-12.67	35.92	46.00	- 10.08	
423.82	V	47.29	-12.32	34.97	46.00	- 11.03	

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ∘
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform •
- (3) Measuring frequency range from 30MHz to 1000MHz  $\circ$
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  $\circ$

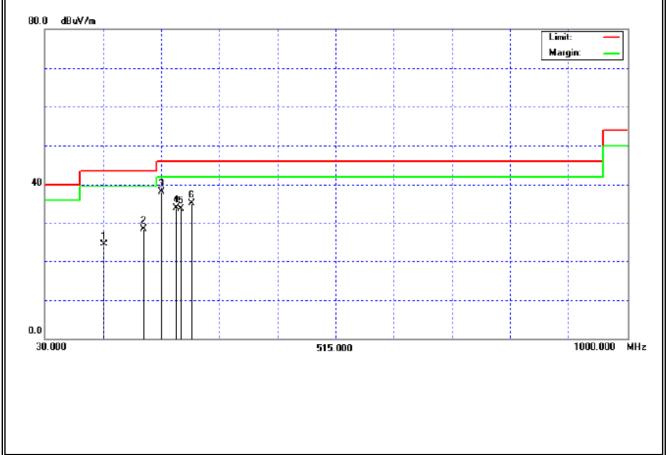




EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE CHANNEL 2412MHz				

Freq.	Ant.	Reading(RA)	Corr.Factor(CF)	Measured(FS)	Limits(QP)	Margin	Note
(MHz)	H/V	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	NOLE
128.94	H	46.46	-21.95	24.51	43.50	- 18.99	
194.90	Н	47.85	-19.43	28.42	43.50	- 15.08	
224.00	Н	56.06	-17.91	38.15	46.00	- 7.85	
249.22	Н	50.81	-16.96	33.85	46.00	- 12.15	
256.98	Н	50.40	-16.75	33.65	46.00	- 12.35	
274.44	Н	51.38	-16.28	35.10	46.00	- 10.90	

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ∘
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform •
- (3) Measuring frequency range from 30MHz to 1000MHz  $\circ$
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table  $\circ$





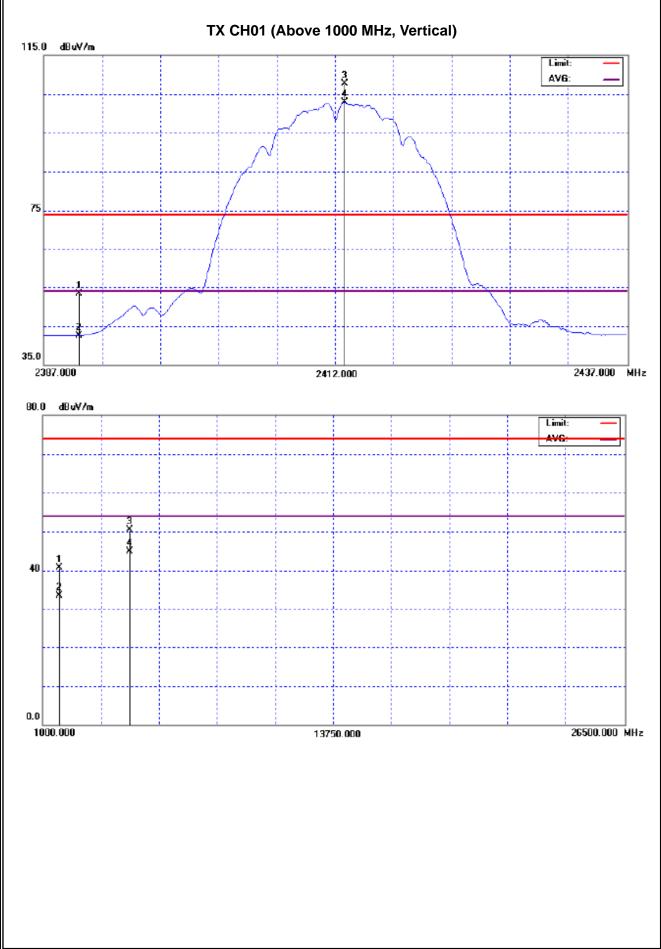
### 4.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321	
Temperature :	<b>25</b> ℃	Relative Humidity :	65%	
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz	
Test Mode :	TX B MODE CHANNEL 2412MHz			

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	21.33	10.46	32.05	53.38	42.51	74.00	54.00	X/E
2412.80	V	75.62	70.88	32.12	107.74	103.00			X/F
1664.56	V	6.75	39.69	-6.14	40.61	33.55	74.00	54.00	X/E
4824.10	V	47.01	41.29	3.57	50.58	44.86	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ\]$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency.
   "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission •
- (4) Data of measurement within this frequency range shown "\*" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 2412M	IHz	

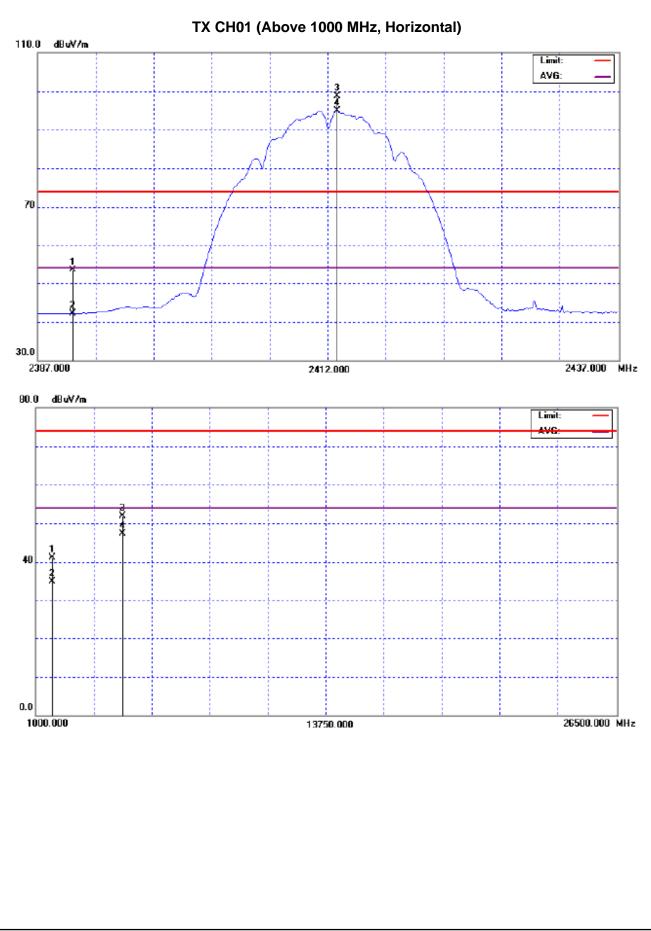
Freq.	Ant.Pol.	Rea	ding	Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	21.50	10.29	32.05	53.55	42.14	74.00	54.00	X/E
2412.80	Н	66.64	62.85	32.12	98.76	94.97			X/F
1664.56	Н	47.26	41.06	-6.14	41.12	34.92	74.00	54.00	X/E
4824.02	Н	48.43	43.68	3.57	52.00	47.25	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE CHANNEL 2412M	1Hz	

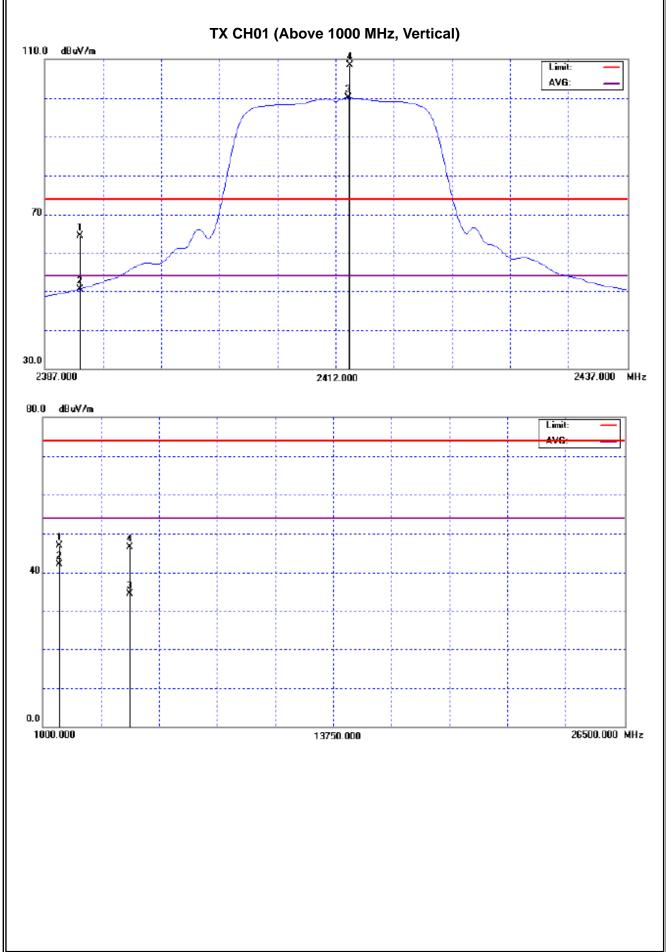
Freq.	Ant.Pol.	Reading A		Ant./CF	F Act.		Limit		
TTEQ.	Ant.i Oi.	Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	32.39	18.52	32.05	64.44	50.57	74.00	54.00	X/E
2413.10	V	76.32	68.02	32.12	108.44	100.14			X/F
1664.40	V	53.02	48.32	-6.14	46.88	42.18	74.00	54.00	X/E
4824.12	V	42.98	30.98	3.57	46.55	34.46	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note $\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ\]$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency.
   "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown "\*" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE CHANNEL 2412M	1Hz	

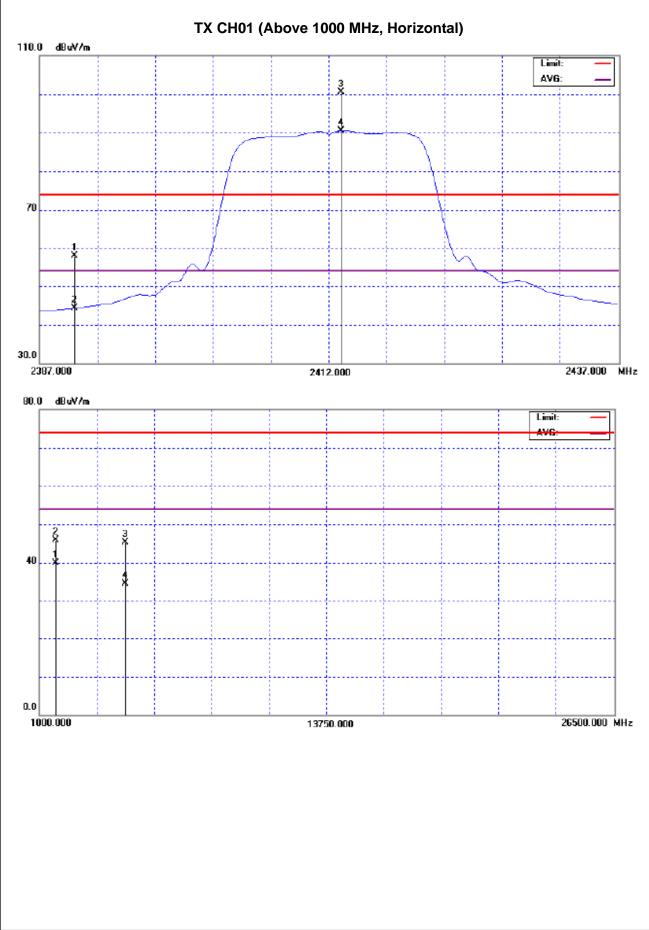
Freq.	Ant.Pol.	Rea	ding	Ant./CF	Ad	ot.	Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	26.02	12.21	32.05	58.07	44.26	74.00	54.00	X/E
2413.10	Н	68.30	58.48	32.12	100.42	90.60			X/F
1664.56	Н	51.97	46.02	-6.14	45.83	39.88	74.00	54.00	X/E
4824.12	Н	41.81	30.89	3.57	45.38	34.46	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ\]$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







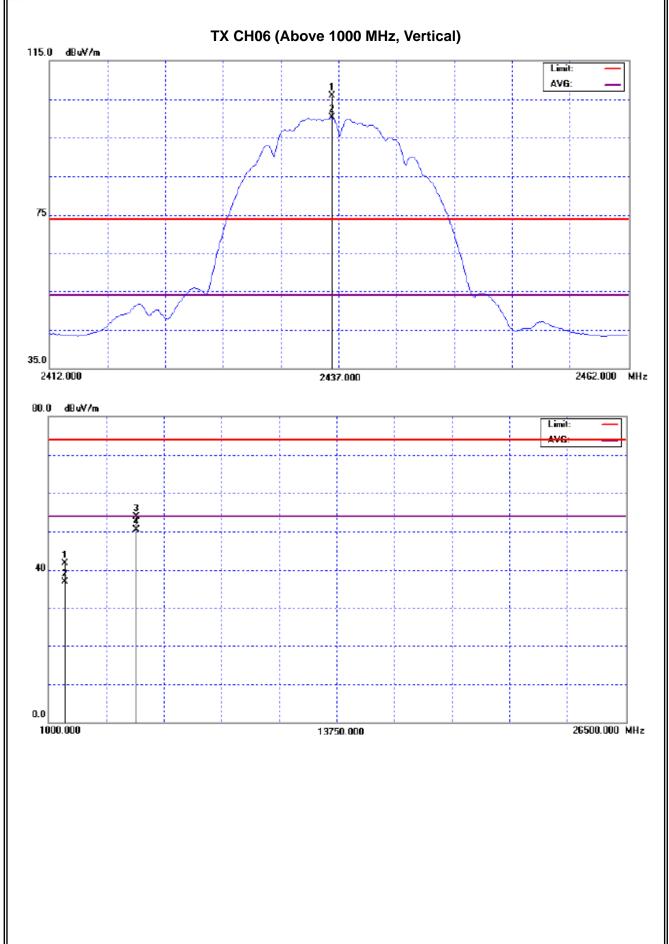
EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 2437M	IHz	

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2436.40	V	73.63	68.11	32.20	105.83	100.31			X/F
1664.48	V	47.93	43.06	-6.14	41.79	36.92	74.00	54.00	X/E
4873.90	V	50.22	46.70	3.72	53.94	50.42	74.00	54.00	X/H

(1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\[\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ$ 

- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
  "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna





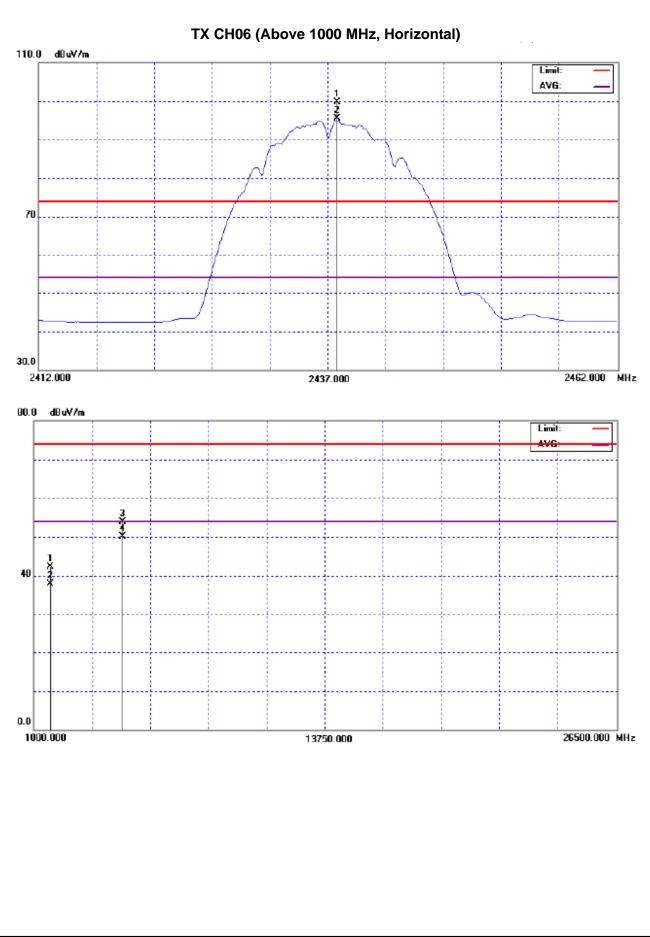


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 2437M	IHz	

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2437.80	Н	67.56	63.35	32.20	99.76	95.55			X/F
1664.56	Н	48.43	44.03	-6.14	42.29	37.89	74.00	54.00	X/E
4874.10	Н	50.16	46.43	3.72	53.88	50.15	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ\]$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321				
Temperature :	<b>25</b> ℃	Relative Humidity :	65%				
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz				
Test Mode :	TX G MODE CHANNEL 2437M	X G MODE CHANNEL 2437MHz					

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2436.20	V	5.81	65.95	32.20	108.01	98.15			X/F
1664.60	V	44.98	38.61	-6.14	38.84	32.47	74.00	54.00	X/E
4874.32	V	41.40	31.45	3.72	45.12	35.17	74.00	54.00	X/F

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ\]$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH06 (Above 1000 MHz, Vertical) 110.0 dBuV/m <del>x</del> Limit: AV6: 70 30.0 2412.000 2437.000 2462.000 MHz 80.0 dBuV/m Limit: AVG 3 3 40 \$ 0.0 1000.000 26500.000 MHz 13750.000

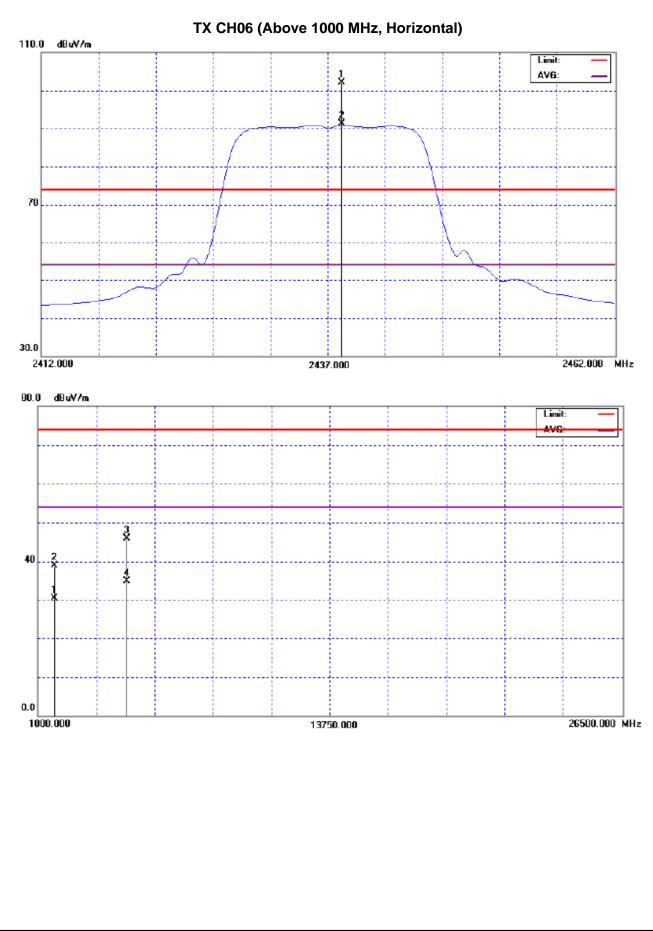


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321			
Temperature :	<b>25</b> ℃	Relative Humidity :	65%			
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz			
Test Mode :	TX G MODE CHANNEL 2437N	TX G MODE CHANNEL 2437MHz				

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Lir		
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2438.20	Н	69.96	59.03	32.20	102.16	91.23			X/F
1664.52	Н	44.98	36.55	-6.14	38.84	30.41	74.00	54.00	X/E
4874.32	Н	42.18	31.19	3.72	45.90	34.91	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note $\[\]$ . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup>"F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MOEDE CHANNEL 2462MHz				

Freq.	Ant.Pol.	Reading		Ant./CF	Ac	Act.		Limit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2462.80	V	74.65	70.52	32.28	106.93	102.80			X/F
2483.50	V	21.86	11.70	32.35	54.21	44.05	74.00	54.00	X/E
1664.53	V	47.06	43.59	-6.14	40.92	37.45	74.00	54.00	X/E
4924.10	V	52.26	47.36	3.87	56.13	51.23	74.00	54.00	X/H

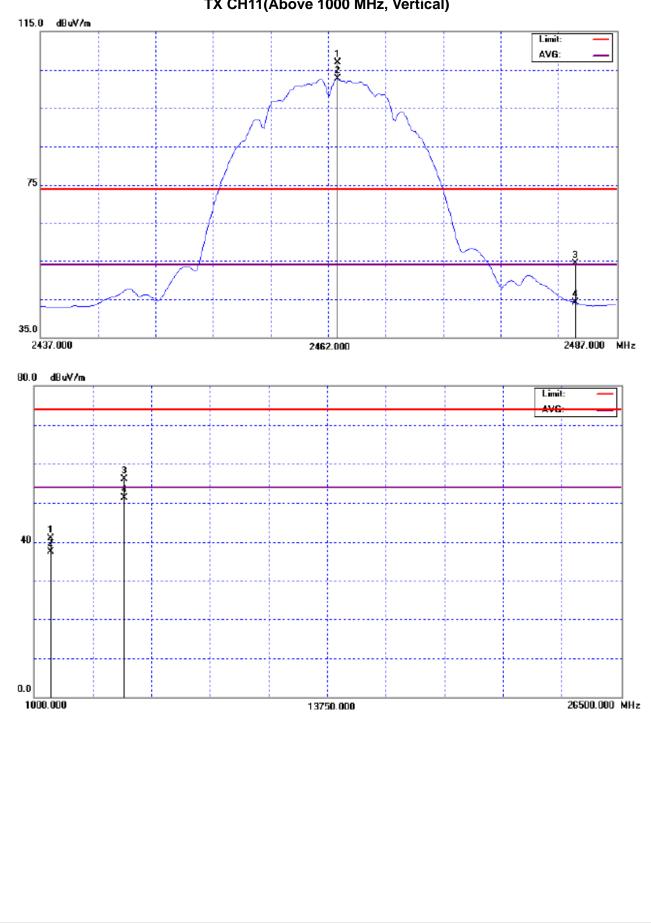
- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH11(Above 1000 MHz, Vertical)





EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MOEDE CHANNEL 2462MHz				

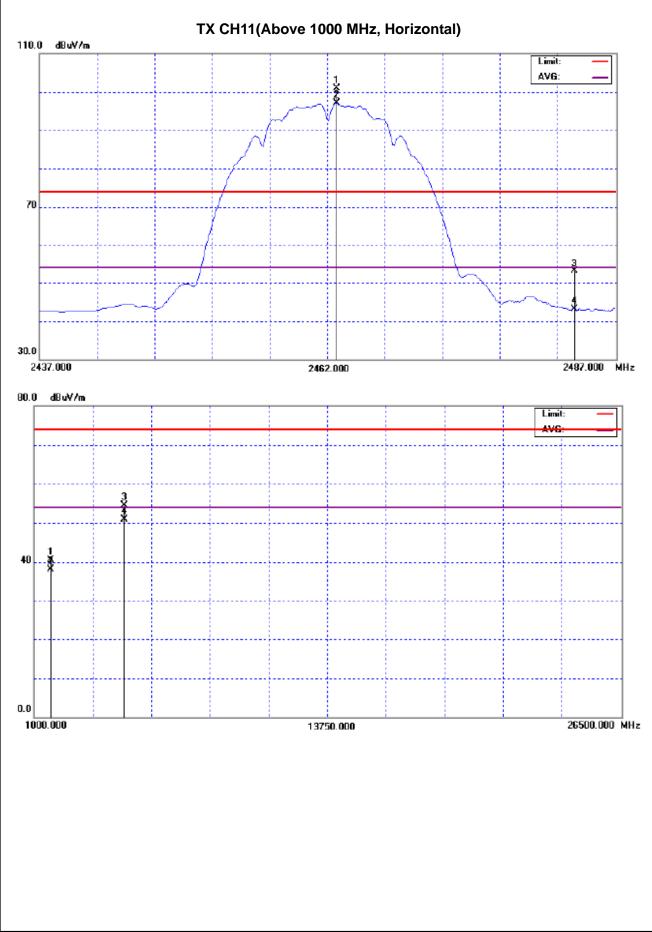
Freq.	Ant.Pol.	Rea	Reading Ant./CF		A	ct. Limit			
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2462.80	Н	68.63	64.78	32.28	100.91	97.06			X/F
2483.50	Н	20.74	10.74	32.35	53.09	43.09	74.00	54.00	X/E
1664.36	Н	46.59	44.23	-6.14	40.45	38.09	74.00	54.00	X/E
4923.98	Н	50.57	47.05	3.87	54.44	50.92	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







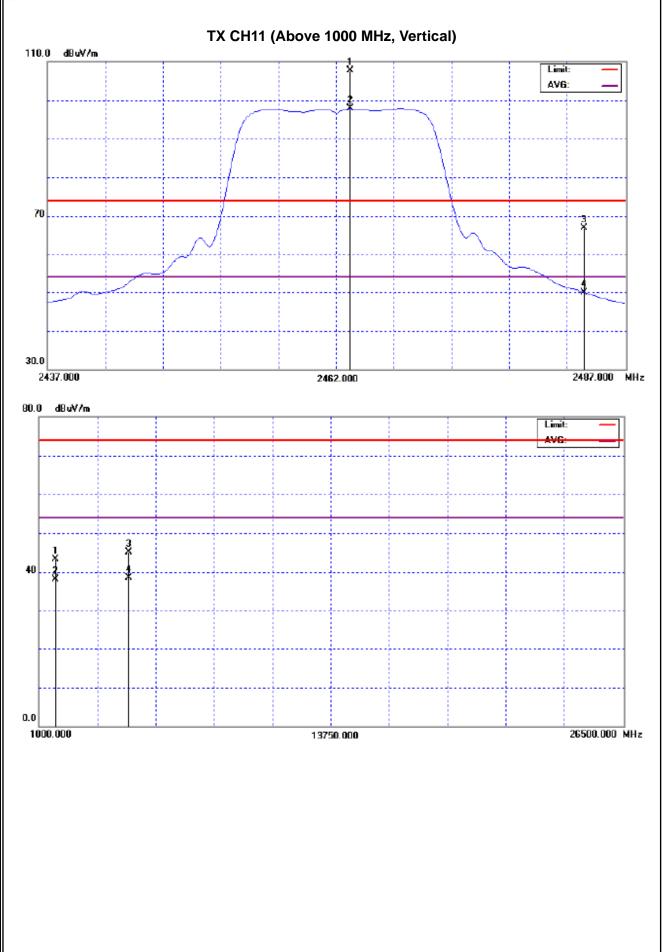


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321			
Temperature :	<b>25</b> ℃	Relative Humidity :	65%			
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz			
Test Mode :	TX G MOEDE CHANNEL 2462	X G MOEDE CHANNEL 2462MHz				

Freq.	Ant.Pol.	Reading		Ant./CF	A	Act.		Limit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2463.20	V	75.50	65.57	32.28	107.78	97.85			X/F
2483.50	V	34.56	17.56	32.35	66.91	49.91	74.00	54.00	X/E
1664.36	V	49.47	44.26	-6.14	43.33	38.12	74.00	54.00	X/E
4924.12	V	41.31	34.67	3.87	45.18	38.54	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of  $\[\]$  Note  $\[\]$  . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\[\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (4) Data of measurement within this frequency range shown "\*" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:
  - "X" denotes Laid on Table; "Y" denotes Vertical Stand; "Z" denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321		
Temperature :	<b>25</b> ℃	Relative Humidity :	65%		
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MOEDE CHANNEL 2462MHz				

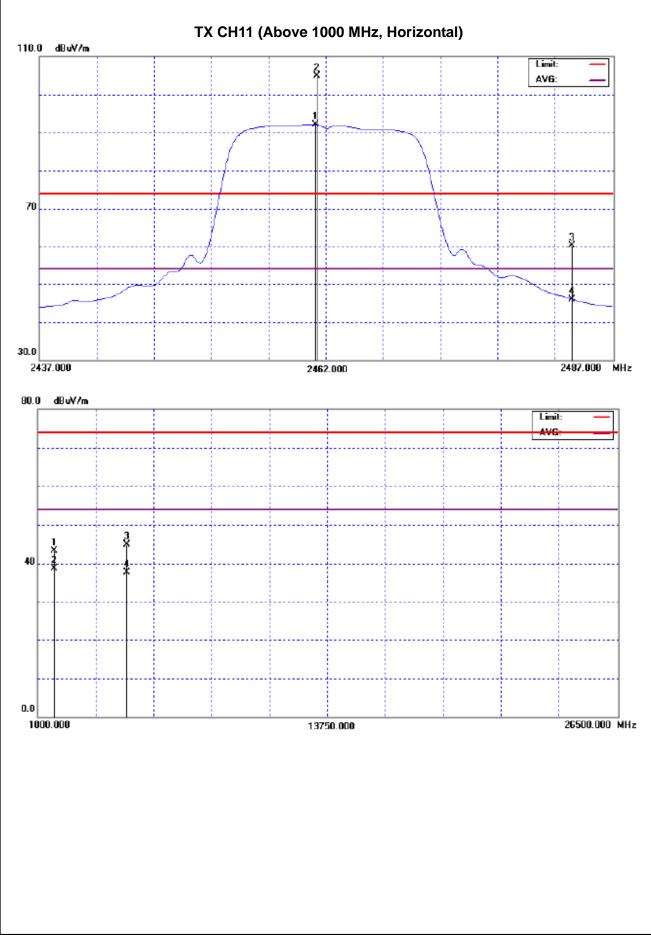
Freq.	Ant.Pol.	Reading		Ant./CF	A	Act.		Limit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2461.10	Н	72.68	59.84	32.28	104.96	92.12			X/F
2483.50	Н	28.02	13.63	32.35	60.37	45.98	74.00	54.00	X/E
1664.36	Н	49.47	44.92	-6.14	43.33	38.78	74.00	54.00	X/E
4924.00	Н	41.04	33.81	3.87	44.91	37.68	74.00	54.00	X/H

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform  $\circ$
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency<sup>o</sup> "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







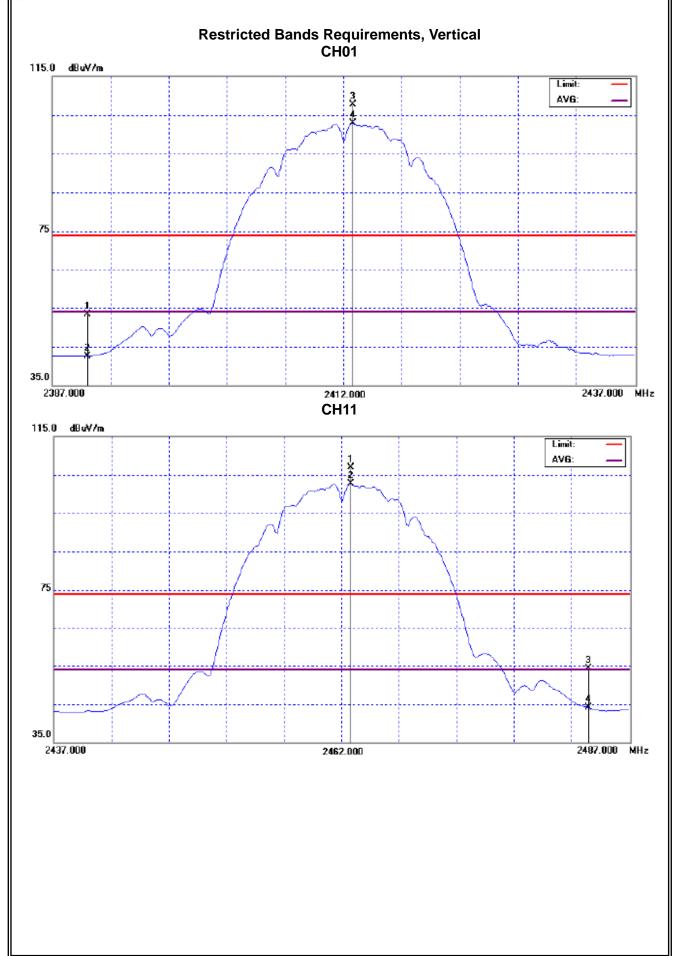
## 4.2.9 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 2412M	IHz/2462MHz (Vertic	al)
Note :	<ol> <li>The transmitter was setup to field strength was measured</li> <li>The transmitter was setup to the field strength was measured</li> </ol>	at 2310-2390 MHz. transmit at the higher	est channel (CH11). Then

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	21.33	10.46	32.05	53.38	42.51	74.00	54.00	CH01
2483.50	V	21.86	11.70	32.35	54.21	44.05	74.00	54.00	CH11

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (2) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







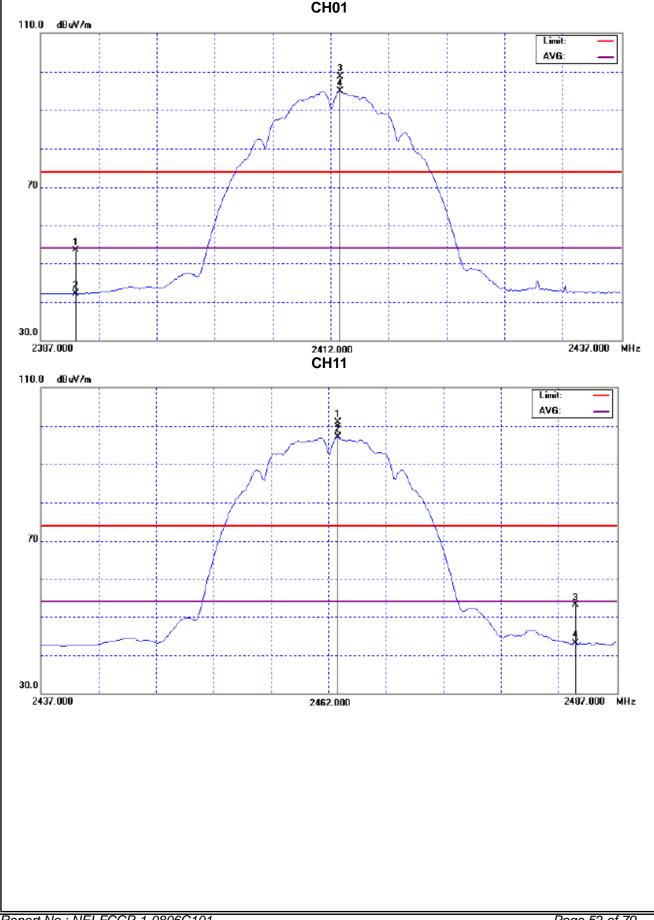
EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B MODE CHANNEL 2412M	IHz/2462MHz (Horizi	ontal)
Note :	<ol> <li>The transmitter was setup to field strength was measured</li> <li>The transmitter was setup to the field strength was measured</li> </ol>	at 2310-2390 MHz. transmit at the higher	est channel (CH11). Then

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	21.50	10.29	32.05	53.55	42.14	74.00	54.00	CH01
2483.50	Н	20.74	10.74	32.35	53.09	43.09	74.00	54.00	CH11

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (2) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Restricted Bands Requirements, Horizontal CH01** 



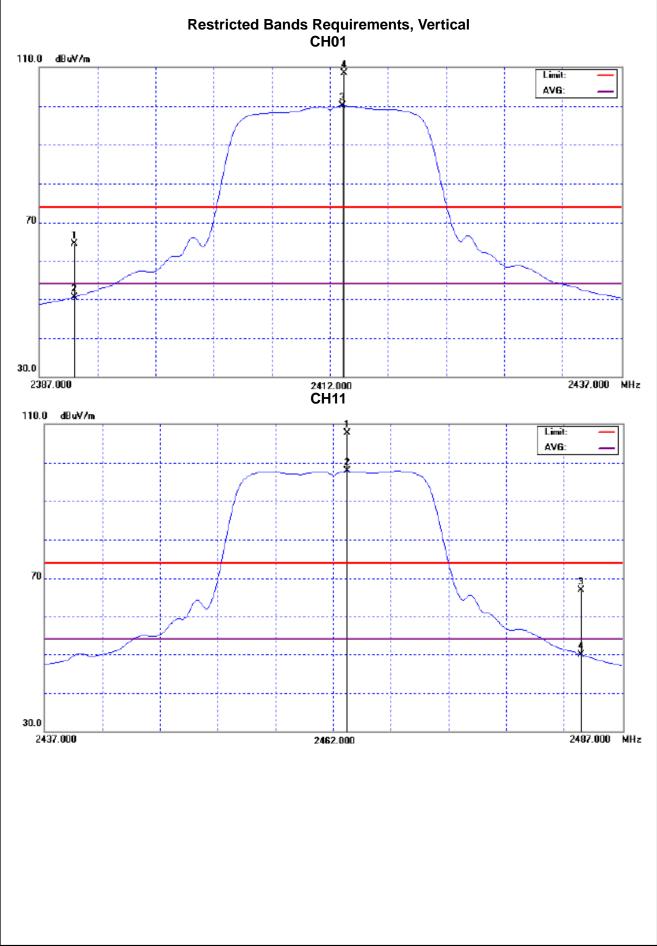


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE CHANNEL 2412N	1Hz/2462MHz (Vertic	al)
Note :	<ol> <li>The transmitter was setup to field strength was measured</li> <li>The transmitter was setup to the field strength was measured</li> </ol>	at 2310-2390 MHz. transmit at the higher	est channel (CH11). Then

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lii	nit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	32.39	18.52	32.05	64.44	50.57	74.00	54.00	CH01
2483.50	V	34.56	17.56	32.35	66.91	49.91	74.00	54.00	CH11

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (2) EUT Orthogonal Axis:
  - "X" denotes Laid on Table ; "Y" denotes Vertical Stand ; "Z" denotes Side Stand
- (3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna







EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	65%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G MODE CHANNEL 2412M	IHz/2462MHz (Horiz	iontal)
Note :	<ol> <li>The transmitter was setup to field strength was measured</li> <li>The transmitter was setup to the field strength was measured</li> </ol>	at 2310-2390 MHz. transmit at the higher	est channel (CH11). Then

Freq.	Ant.Pol.	Rea	ding	Ant./CF	A	ct.	Lir	nit	
		Peak	AV		Peak	AV	Peak	AV	Note
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	Н	26.02	12.21	32.05	58.07	44.26	74.00	54.00	CH01
2483.50	Н	28.02	13.63	32.35	60.37	45.98	74.00	54.00	CH11

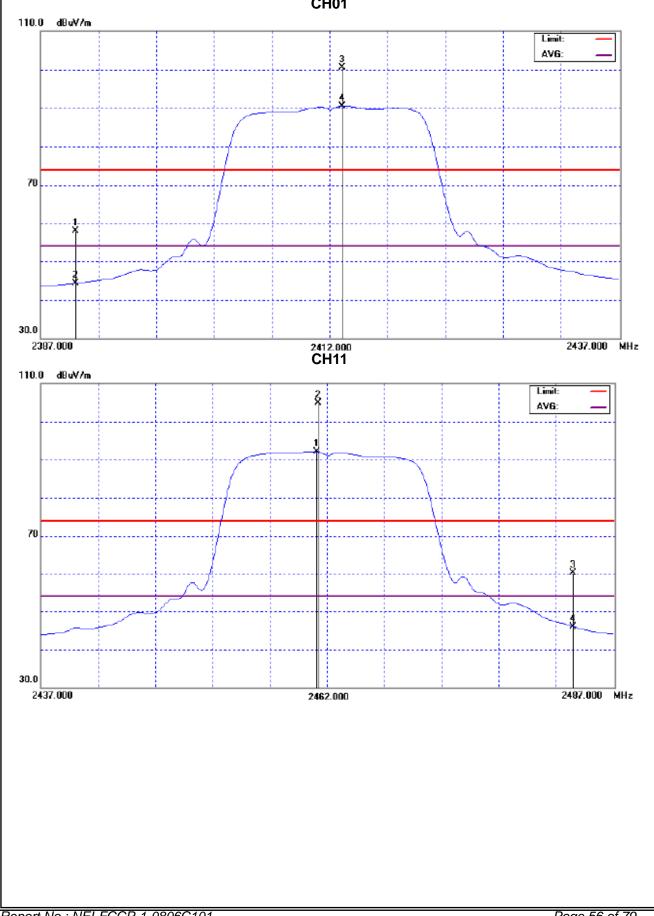
- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission  $\circ$
- (2) EUT Orthogonal Axis:

"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand

(3) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Restricted Bands Requirements, Horizontal CH01** 





# 5. BANDWIDTH TEST

## 5.1 Applied procedures / limit

	FCC Part15 (15.247), Subpart C						
Se	ection	Test Item	Limit	Frequency Range (MHz)	Result		
	5.247 a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS		

## 5.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

## 5.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 20 ms.

## 5.1.3 DEVIATION FROM STANDARD

No deviation.



## 5.1.4 TEST SETUP



### 5.1.5 EUT OPERATION CONDITIONS

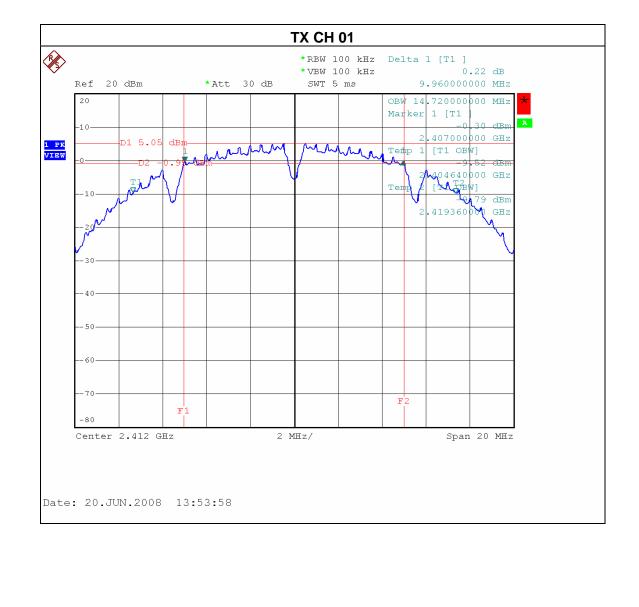
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



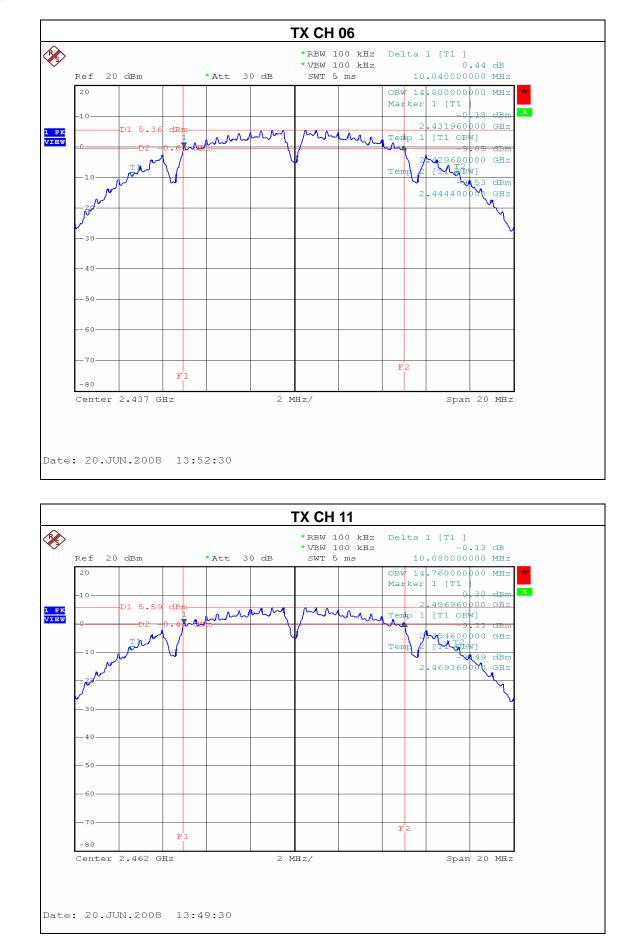
## 5.1.6 TEST RESULTS

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B mode /CH01, CH06, CH1	1	

Test Channel	Frequency	Bandwidth	99% Occupied BW	LIMIT
	(MHz)	(MHz)	(MHz)	(MHz)
CH01	2412	9.96	14.72	>=500KHz
CH06	2437	10.04	14.80	>=500KHz
CH11	2462	10.08	14.76	>=500KHz







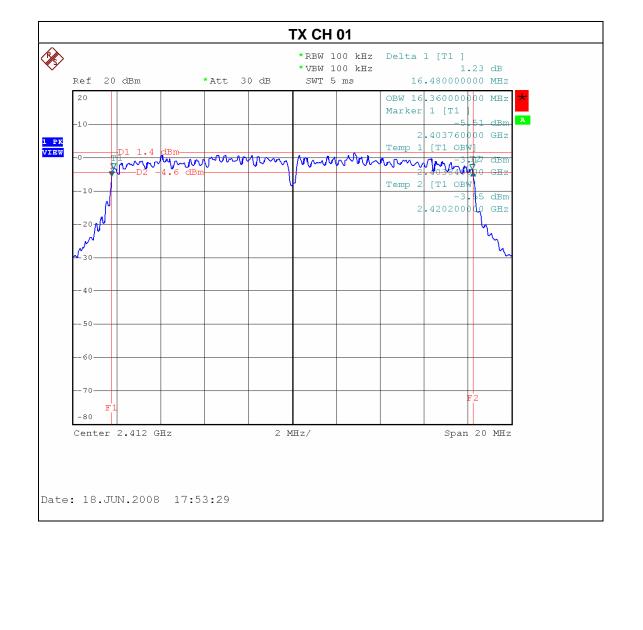
Report No.: NEI-FCCP-1-0806C101

Page 60 of 79

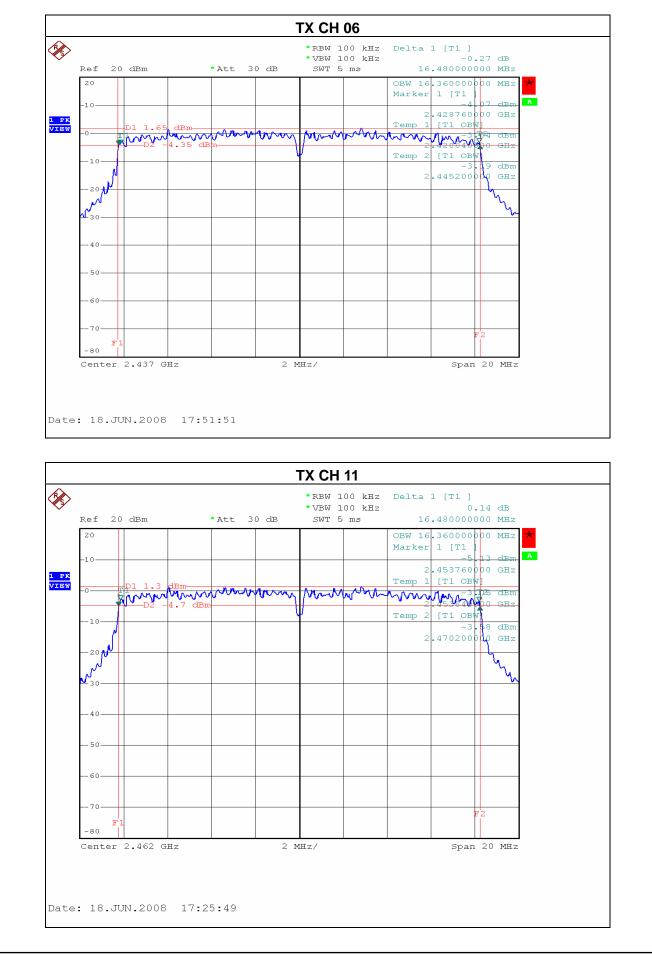


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G mode /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Bandwidth (MHz)	99% Occupied BW (MHz)	LIMIT (MHz)
CH01	2412	16.48	16.36	>=500KHz
CH06	2437	16.48	16.36	>=500KHz
CH11	2462	16.48	16.36	>=500KHz









## 6. PEAK OUTPUT POWER TEST

#### 6.1 Applied procedures / limit

FCC Part15 (15.247), Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247 (b)(1)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS	

#### 6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2487A	6K00004714	Feb. 12, 2009
2	Power Meter Sensor	Anritsu	MA2491A	34138	Feb. 12, 2009

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

### 6.1.2 TEST PROCEDURE

a. The EUT was directly connected to the power metter and antenna output port as show in the block diagram below,

#### 6.1.3 DEVIATION FROM STANDARD

No deviation.

#### 6.1.4 TEST SETUP



### 6.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



## 6.1.6 TEST RESULTS

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B mode /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	17.68	30	1
CH06	2437 MHz	18.07	30	1
CH11	2462 MHz	18.25	30	1

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G mode /CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2412 MHz	14.32	30	1
CH06	2437 MHz	14.81	30	1
CH11	2462 MHz	14.98	30	1



## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

#### 7.1 Applied procedures / limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### 7.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (other emission)	100 KHz /100 KHz for Peak

### 7.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

#### 7.1.3 DEVIATION FROM STANDARD

No deviation.

## 7.1.4 TEST SETUP

EUT	SPECTRUM
	ANALYZER



## 7.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



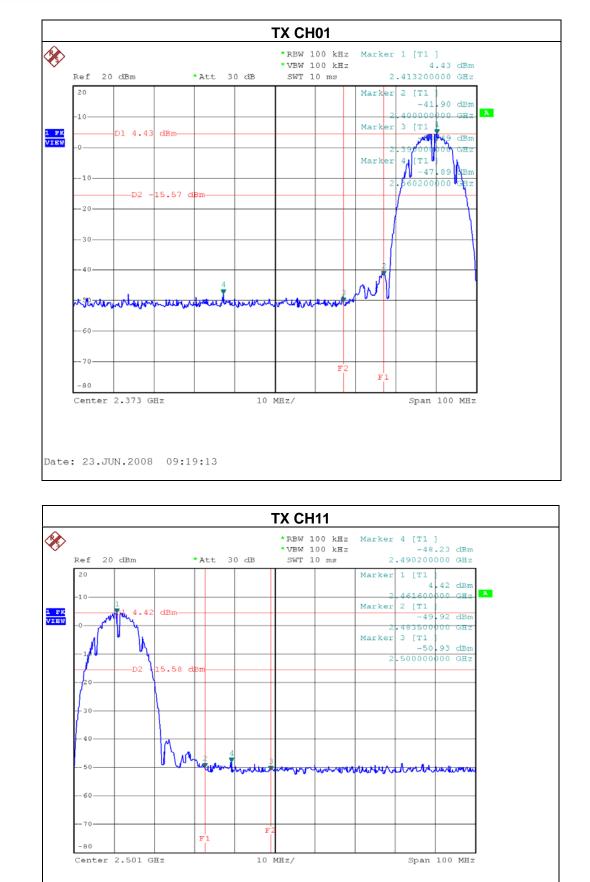
## 7.1.6 TEST RESULTS

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B mode CH01, CH11		

Channel of Worst Data: CH01					
The max. radio frequency power in any 100kHz bandwidth outside the frequency band bandwidth within the frequency band.					
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)		
2360.20 -47.89 2490.20 -48.23					
	Result				

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.





Date: 23.JUN.2008 09:32:26

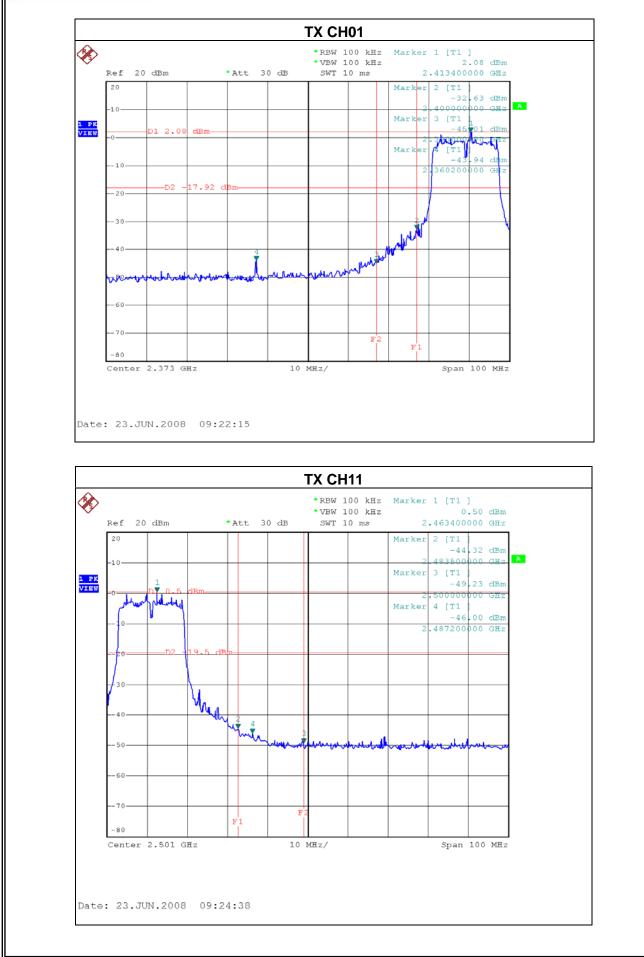


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G mode CH01, CH11		

Channel of Worst Data: CH01				
The max. radio frequency power in any 100kHz bandwidth outside the frequency band bandwidth within the frequency band.				
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)	
2360.20 -43.94 2483.50 -44.32				
Result				

In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.







## 8. POWER SPECTRAL DENSITY TEST

### 8.1 Applied procedures / limit

	FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247 (d)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS		

#### 8.1.1 MEASUREMENT INSTRUMENTS LIST

Ite	em	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
	1	Spectrum Analyzer	R&S	FSP_40	100129	Jan. 07, 2009

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

#### 8.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW=3KHz, VBW=30 KHz, Sweep time = 500s.

#### 8.1.3 DEVIATION FROM STANDARD

No deviation.

#### 8.1.4 TEST SETUP



### 8.1.5 EUT OPERATION CONDITIONS

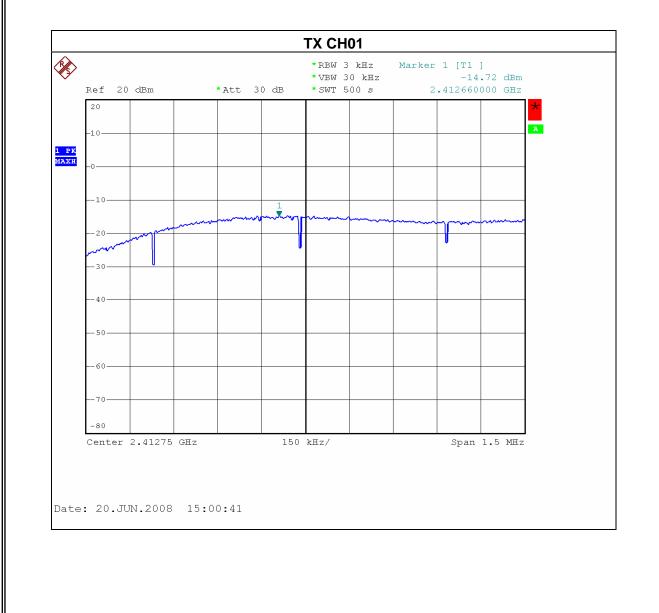
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



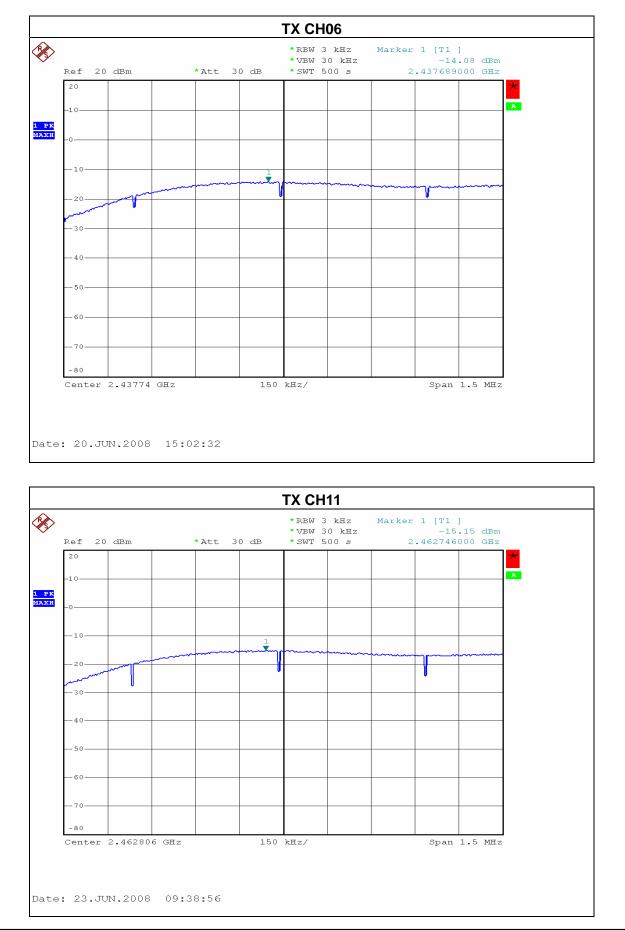
## 8.1.6 TEST RESULTS

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B mode CH01, CH06, CH11		

Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH01	2412 MHz	-14.72	8
CH06	2437 MHz	-14.08	8
CH11	2462 MHz	-15.15	8



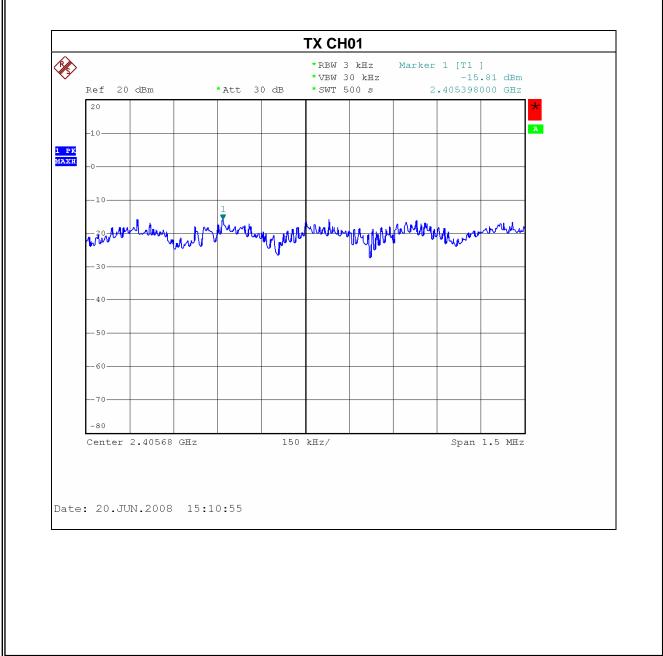




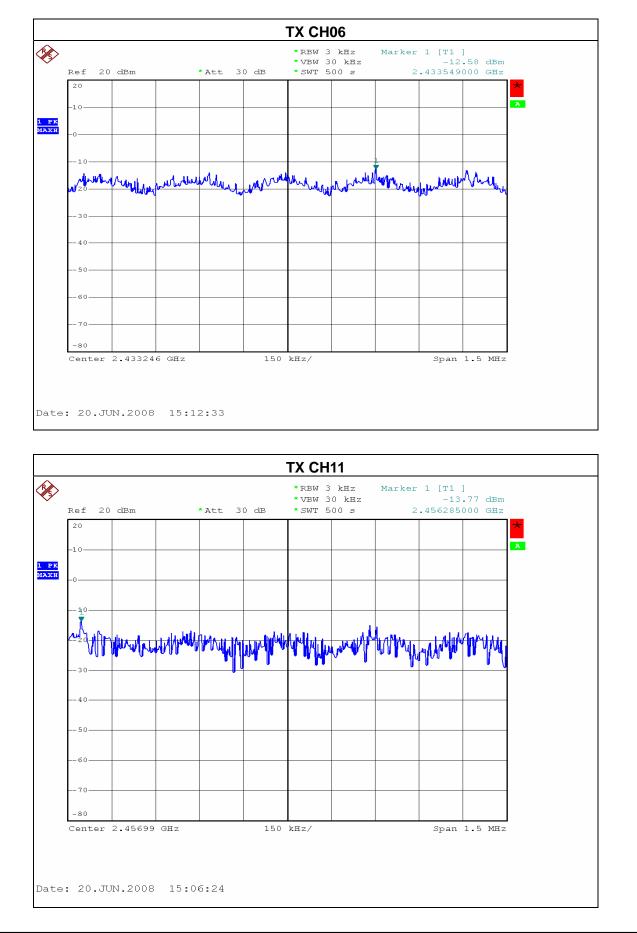


EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX G mode CH01, CH06, CH11		

Test Channel	Frequency	Power Density	LIMIT
	(MHz)	(dBm)	(dBm)
CH01	2412 MHz	-15.81	8
CH06	2437 MHz	-12.58	8
CH11	2462 MHz	-13.77	8







Report No.: NEI-FCCP-1-0806C101



## 9. RF EXPOSURE TEST

### 9.1 APPLIED PROCEDURES / LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 9.1.1 MPE CALCULATION METHOD

$$\mathsf{E}(\mathsf{V/m}) = \frac{\sqrt{30 \times P \times G}}{d}$$

Power Density: Pd (W/m<sup>2</sup>)  $=\frac{E^2}{377}$ 

$$\mathbf{E} = \text{Electric field (V/m)}$$

 $\mathbf{P}$  = Peak RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$\mathbf{Pd} = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

### 9.1.2 DEVIATION FROM STANDARD

No deviation.

## 9.1.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



## 9.1.4 TEST RESULTS

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321
Temperature :	<b>25</b> ℃	Relative Humidity :	60%
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX B mode CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2.0	1.5849	17.6800	58.6138	0.018491	1	Complies
2.0	1.5849	18.0700	64.1210	0.020228	1	Complies
2.0	1.5849	18.2500	66.8344	0.021084	1	Complies

EUT :	802.11g 54Mbps Wireless LAN PCI Adapter	Model Name :	NW321	
Temperature :	<b>25</b> ℃	Relative Humidity :	60%	
Pressure :	1016 hPa	Test Voltage :	AC 120V/60Hz	
Test Mode :	TX G mode CH01, CH06, CH11			

Antenna Gain (dBi)		Peak Output Power (dBm)		Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2.0	1.5849	14.3200	27.0396	0.008530	1	Complies
2.0	1.5849	14.8100	30.2691	0.009549	1	Complies
2.0	1.5849	14.9800	31.4775	0.009930	1	Complies



Neutron Engineering Inc.

# 10. EUT TEST PHOTO

**Conducted Measurement Photos** 







# **Radiated Measurement Photos**



