



## FCC Test Report

**Issued Date** : Jan. 15, 2009  
**Project No.** : R0812005  
**Equipment** : Wireless 11n PCI card  
**Model Name** : NI22; NI22/Y; NI23; NI23/Y  
  
**Applicant** : Aceex Corporation  
**Address** : 2F, No 2, Alley 1, Sze-Wei Lane, (ABC  
Fareast Industrial Park) Chung-cheng  
Rd., Hsintien, Taipei 23138, Taiwan,  
R.O.C.

**Tested by:**  
Neutron Engineering Inc. EMC Laboratory  
**Date of Test:**  
Dec. 09, 2008 ~ Jan. 08, 2009

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### **Declaration**

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.

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### **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



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## **1. CERTIFICATION**

Equipment: Wireless 11n PCI card  
Brand Name: ACEEX  
Model Name: NI22; NI22/Y; NI23; NI23/Y  
Applicant: Aceex Corporation  
Date of Test: Dec. 09, 2008 ~ Jan. 08, 2009  
Standards: FCC Part 15, Subpart B, Class B  
CISPR 22: 1997+A1: 2000, Class B  
ICES-003: 2004, Class B  
ANSI 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-FCCE-1-R0812005) 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:

Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15, Subpart B CISPR 22:1997+A1: 2000 ICES-003: 2004	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	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/OS01** at the location of No.132-1, Lane 329, Sec. 2, Palian Road, Shijr City, Taipei, Taiwan.

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95%** ◦

### 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	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
OS-02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless 11n PCI card
Brand Name	ACEEX
Model Name	NI22; NI22/Y; NI23; NI23/Y
OEM Brand/Model Name	NET ZEN / NW-I300
Model Difference	Model NI22/Y, NI23, NI23/Y and NW-I300 are identical to model NI22 except the model designation.
Product Description	The EUT is a Wireless 11n PCI card. Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	Supplied from PC PCI Slot.
Power Rating	N/A
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	N/A
EUT Modification(s)	N/A

**Note:**

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



### 3.2 DESCRIPTION OF TEST MODES

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

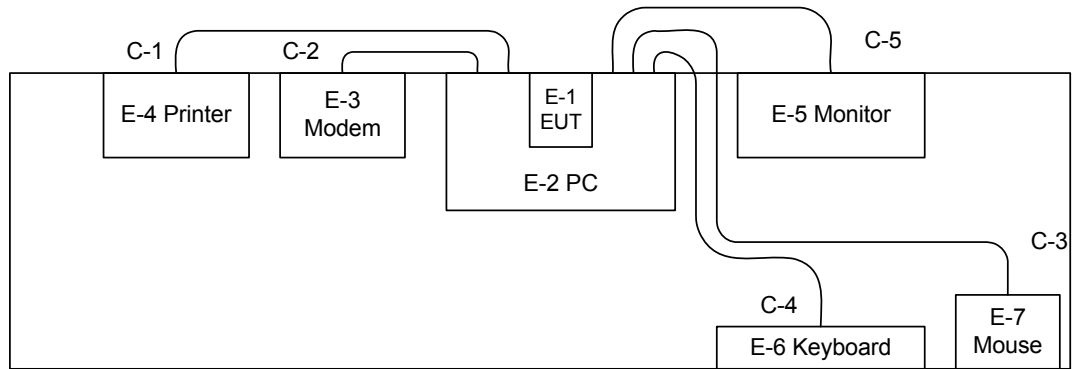
Pretest Test Mode	Description
Mode 1	NORMAL LINK

For Conducted Test	
Final Test Mode	Description
Mode 1	NORMAL LINK

For Radiated Test	
Final Test Mode	Description
Mode 1	NORMAL LINK



### 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



C-1 Parallel Cable  
 C-2 RS232 Cable  
 C-3 PS/2 Cable  
 C-4 PS/2 Cable  
 C-5 D-SUB Cable



### 3.4 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	Wireless 11n PCI card	ACEEX	NI22	IFA-NIXX	N/A	EUT
E-2	PC	HP	HP Compaq dx7400	DOC	SGH7480DKZ	
E-3	Modem	ACEEX	DM-1414V	DOC	8041708	
E-4	Printer	SII	DPU-414	DOC	1045105A	
E-5	19" LCD Monitor	Samsung	SyncMaster 193P	DOC	DI19H4JXC05517A	
E-6	PS/2 K/B	Logitech	Y-SJ17(ACK260A)	DOC	SYU44664880	
E-7	PS/2 Mouse	Logitech	M-SBF69	DOC	HCA44601156	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Yes	No	170CM	
C-2	Yes	No	180CM	
C-3	Yes	No	170CM	
C-4	Yes	No	150CM	
C-5	Yes	Yes	180CM	

Note:

- (1) The support equipment was authorized by Declaration of Conformity.
- (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 (FREQUENCY RANGE 150KHZ-30MHZ)

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

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Test Cable	N/A	SR03_C_01 &02	N/A	Oct. 19, 2009
2	LISN (SR03)	EMCO	3816/2	00042991	Jan. 29, 2009
3	Pulse Limiter	Electro-Metrics	EM-7600	112647	Dec. 15, 2009
4	50Ω Terminator	N/A	N/A	N/A	May 13, 2009
5	EMI Test Receiver	R&S	ESCI	100082	Mar. 23, 2009
6	LISN	EMCO	4825/2	00028234	Jul. 09, 2009

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

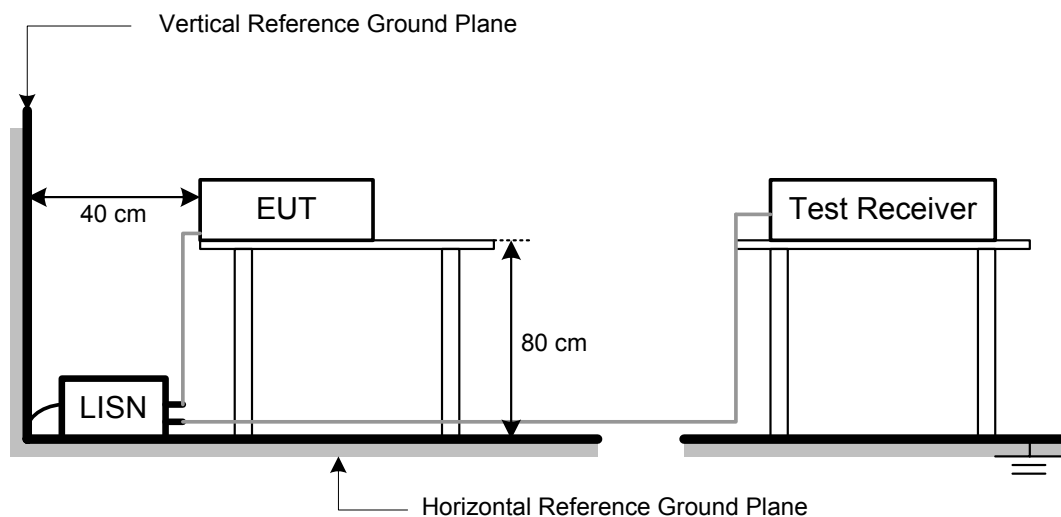
#### 4.1.3 TEST PROCEDURE

- The EUT was placed 0.8 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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





#### **4.1.6 EUT OPERATING CONDITIONS**

The EUT exercise program (EMC.exe) used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read (write) from (to) mass storage device (Disk).
2. Send "H" pattern to video port device (LCD Monitor).
3. Send " H " pattern to parallel port device (Printer).
4. Send " H " pattern to serial port device (Modem).
5. RF function has been programmed to continuously TX/RX during test.
6. Repeated from 2 to 5 continuously.

As the keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.



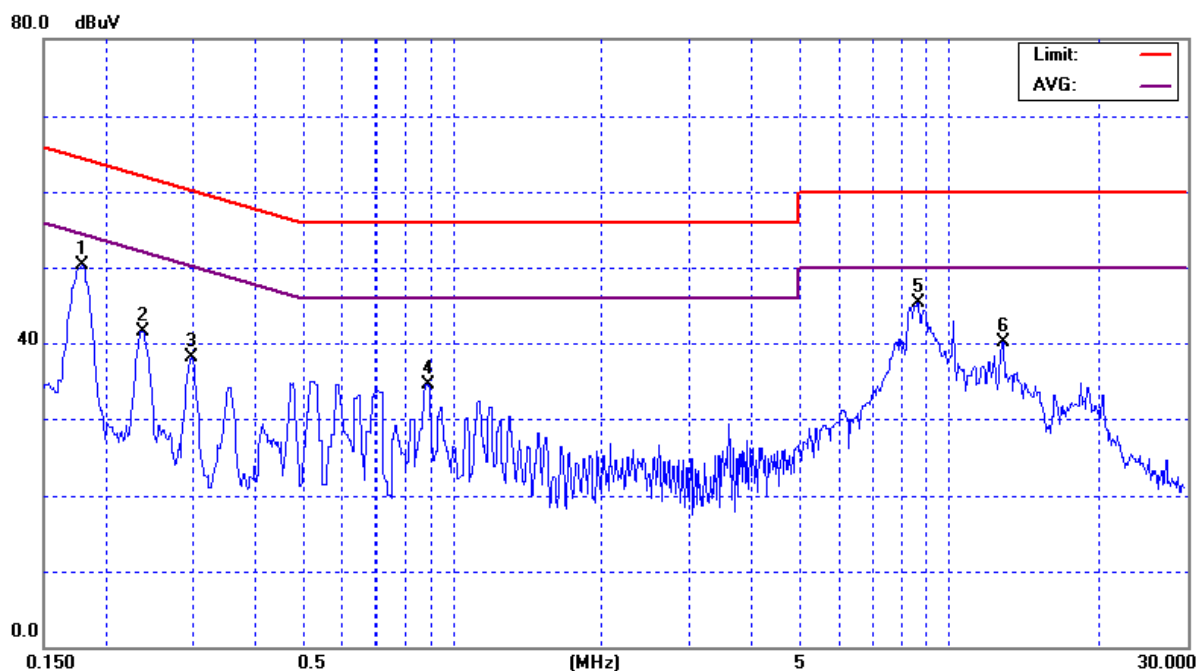
#### 4.1.7 TEST RESULTS

E.U.T :	Wireless 11n PCI card	Model Name :	NI22
Temperature :	26° C	Relative Humidity :	55%
Test Voltage :	AC 120V/60Hz		
Test Mode :	NORMAL LINK		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Line	50.24	*	64.51	54.51	-14.27	(QP)
0.24	Line	41.57	*	62.21	52.21	-20.64	(QP)
0.30	Line	38.17	*	60.29	50.29	-22.12	(QP)
0.89	Line	34.42	*	56.00	46.00	-21.58	(QP)
8.65	Line	45.24	*	60.00	50.00	-14.76	(QP)
12.80	Line	40.07	*	60.00	50.00	-19.93	(QP)

#### Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.2 sec./MHz ◦ Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz,VBW=10KHz, Swp. Time =0.2sec./MHz ◦
- (2) 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 ◦
- (3) Measuring frequency range from 150KHz to 30MHz ◦



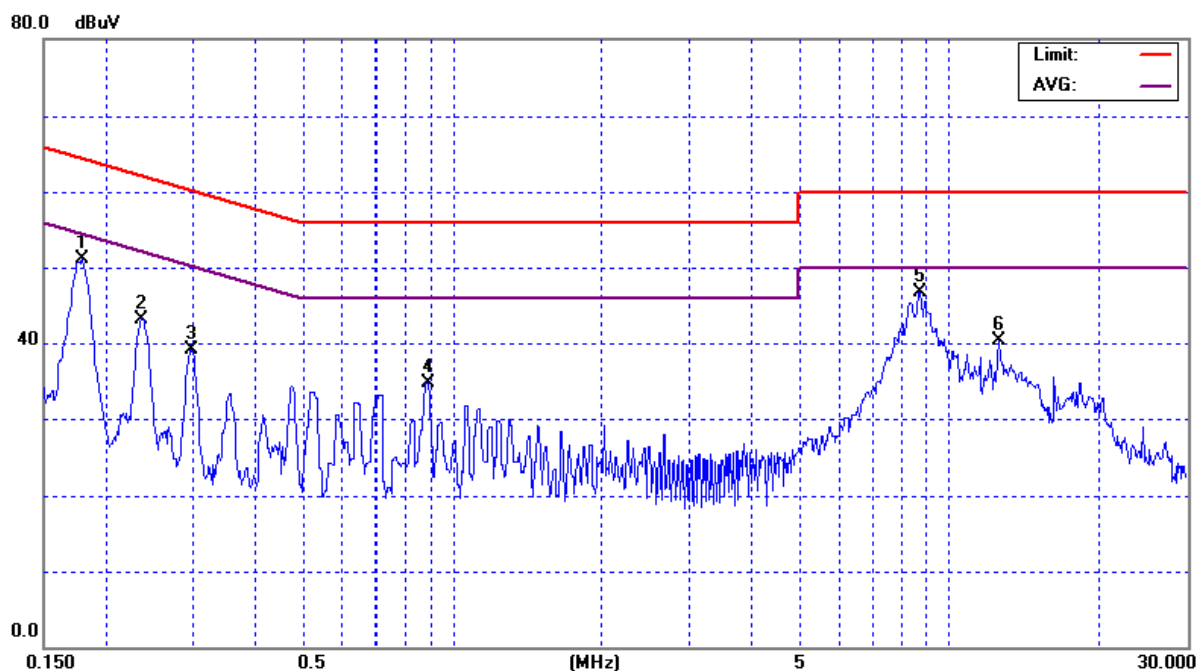


E.U.T :	Wireless 11n PCI card	Model Name :	NI22
Temperature :	26 ° C	Relative Humidity :	55%
Test Voltage :	AC 120V/60Hz		
Test Mode :	NORMAL LINK		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.18	Neutral	51.13	*	64.51	54.51	-13.38	(QP)
0.24	Neutral	43.20	*	62.23	52.23	-19.03	(QP)
0.30	Neutral	39.10	*	60.31	50.31	-21.21	(QP)
0.89	Neutral	34.68	*	56.00	46.00	-21.32	(QP)
8.70	Neutral	46.62	*	60.00	50.00	-13.38	(QP)
12.60	Neutral	40.26	*	60.00	50.00	-19.74	(QP)

**Remark**

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.2 sec./MHz ◦  
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10KHz,VBW=10KHz, Swp. Time =0.2sec./MHz ◦
- (2) 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 ◦
- (3) Measuring frequency range from 150KHz to 30MHz ◦





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (BELOW 1000MHZ)

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

Notes:

- (1) The limit for radiated test was performed according to as following:  
CISPR 22/ FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### LIMITS OF RADIATED EMISSION MEASUREMENT (ABOVE 1000MHZ)

FREQUENCY (MHz)	Class A (dBuV/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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9160	3176	Jul. 24, 2009
2	Test Cable	N/A	10M_OS01	N/A	Oct. 20, 2009
3	Test Cable	N/A	OS01-1/-2	N/A	Oct. 08, 2009
4	Pre-Amplifier	Anritsu	MH648A(OS01)	M09961	Oct. 08, 2009
5	Positioning Controller (OS01)	MF	MF7802	N/A	N/A
6	Turn Table	Chance Most	CMTB-1.5	N/A	N/A
7	Spectrum Analyzer	HP	8591EM	3536A00681010	Mar. 13, 2009
8	EMI Measuring Receiver	SHCAFFNER	SCR 3501	408	Nov.24.2009

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

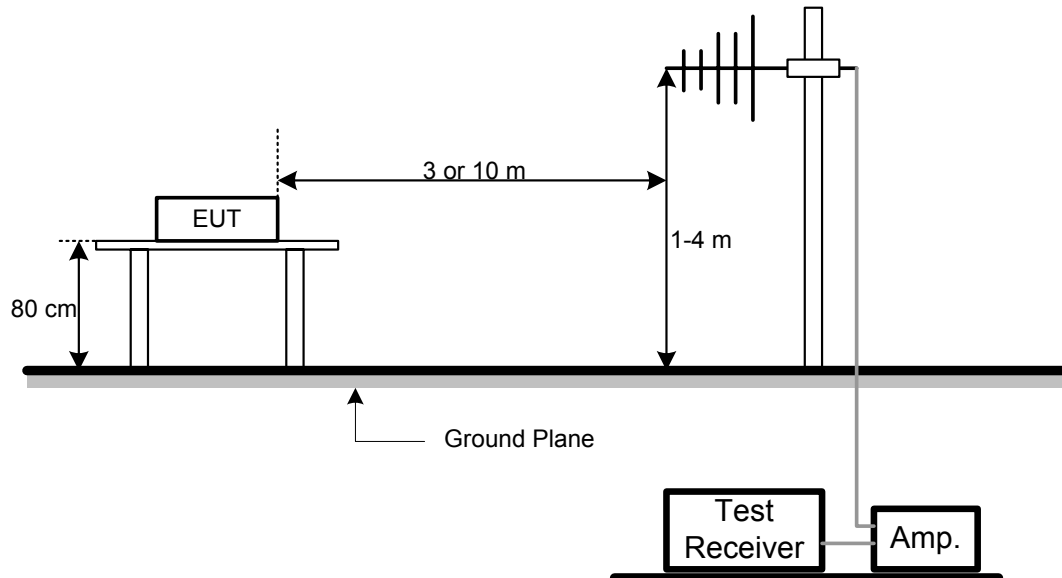
#### 4.2.3 TEST PROCEDURE

- The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- The initial step in collecting radiated 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.
- 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.
- 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



#### 4.2.6 EUT OPERATING 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.

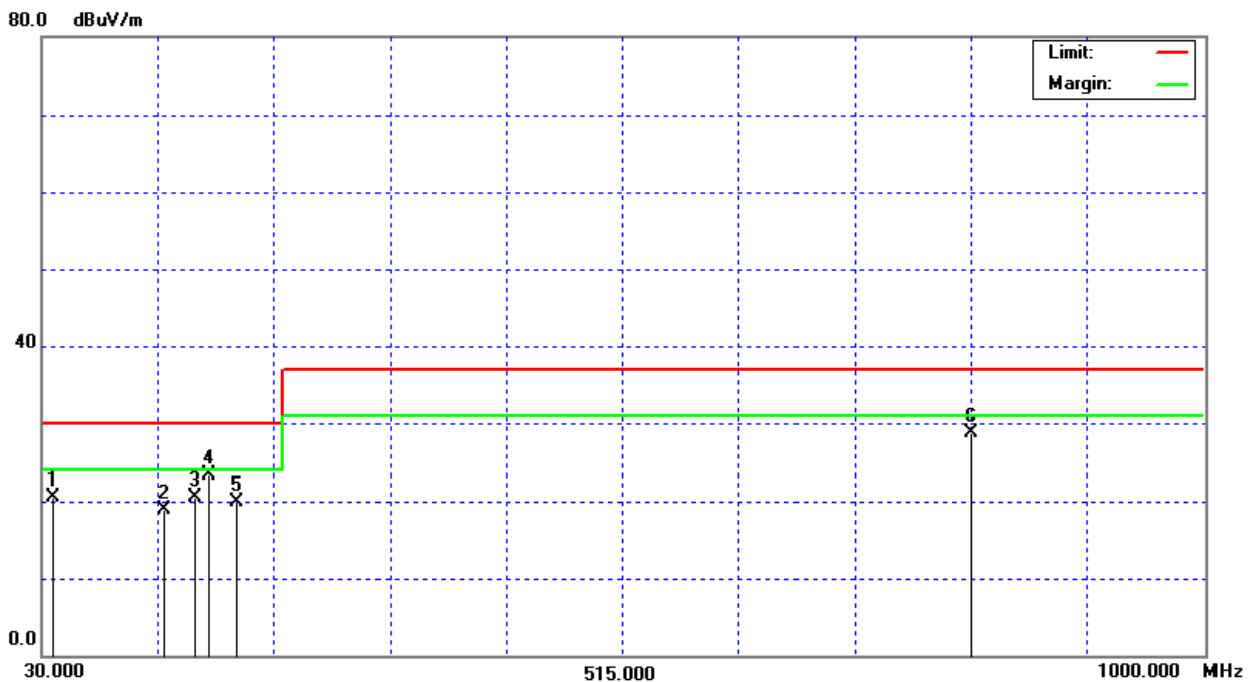
#### 4.2.7 TEST RESULTS

E.U.T :	Wireless 11n PCI card	Model Name :	NI22
Temperature :	18 ° C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz		
Test Mode :	NORMAL LINK		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
39.00	V	26.12	-5.71	20.41	30.00	- 9.59	
130.90	V	23.45	-4.57	18.88	30.00	- 11.12	
156.11	V	24.92	-4.47	20.45	30.00	- 9.55	
169.32	V	27.32	-4.01	23.31	30.00	- 6.69	
191.10	V	26.12	-6.30	19.82	30.00	- 10.18	
806.00	V	19.60	9.02	28.62	37.00	- 8.38	

Remark :

- (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 ◦
- (4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table ◦



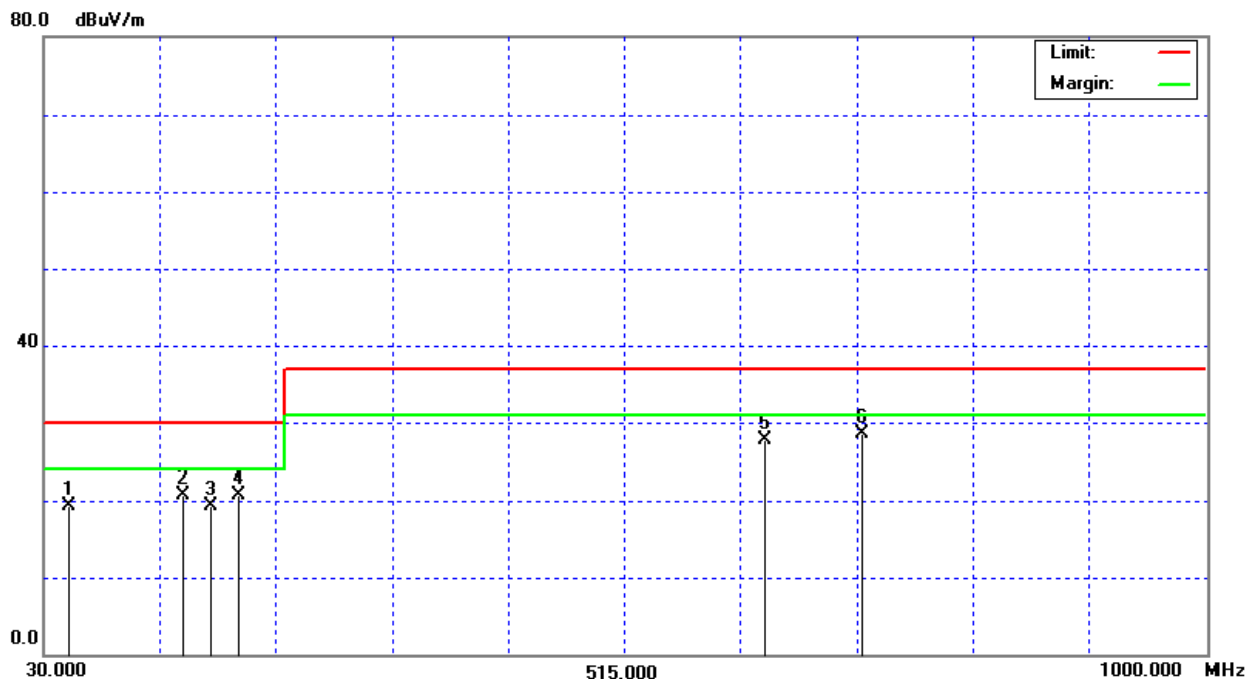


E.U.T :	Wireless 11n PCI card	Model Name :	NI22
Temperature :	18 °C	Relative Humidity :	89%
Test Voltage :	AC 120V/60Hz		
Test Mode :	NORMAL LINK		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
49.48	H	24.70	-5.31	19.39	30.00	- 10.61	
146.09	H	25.15	-4.51	20.64	30.00	- 9.36	
168.12	H	23.38	-4.06	19.32	30.00	- 10.68	
191.04	H	27.02	-6.29	20.73	30.00	- 9.27	
633.34	H	22.45	5.25	27.70	37.00	- 9.30	
712.07	H	21.59	6.82	28.41	37.00	- 8.59	

**Remark :**

- (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 ◦
- (4) If the peak scan value is under the limit for more than 20dB, the signal will not show in table ◦





## 5. EUT TEST PHOTO

### Conducted Measurement Photos





**Radiated Measurement Photos**

