



Test Report

FCC Part90 Subpart Y

Product Name : WIRELESS-A/N 20DBM NETWORK
MINI PCI ADAPTER WITH ESD
Model No. : WLM200N5-23-4.9
FCC ID : OLXWLM200N5-49

Applicant : KBC Networks Limited
Address : 1301 Bank of America Tower 12 Harcourt Road
Central Hong Kong

Date of Receipt : 30/08/2012
Test Date : 30/08/2012~24/09/2012
Issued Date : 25/09/2012
Report No. : 128S072R-RF-US-P11V01
Report Version : V1.2

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, CNAS or any agency of the Government.

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

Test Report Certification

Issued Date : 25/09/2012

Report No. : 128S072R-RF-US-P11V01



Product Name : WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD

Applicant : KBC Networks Limited

Address : 1301 Bank of America Tower 12 Harcourt Road Central Hong Kong

Manufacturer : KBC NETWORKS

Address : 25691 Atlantic Ocean Drive Suite B-3 Lake Forest, CA 92630

Model No. : WLM200N5-23-4.9

FCC ID : OLXWLM200N5-49

EUT Voltage : DC 3.3V

Brand Name : KBC

Applicable Standard : FCC CFR Title 47 Part 90 Subpart Y: 2011
FCC CFR Title 47 Part 2: 2011
ANSI TIA-603-C-2004

Test Result : Complied

Performed Location : Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

Documented By : Alice Ni
(Engineering ADM: Alice Ni)

Reviewed By : Jame Yuan
(Senior Engineer: Jame Yuan)

Approved By : Marlin Chen
(Manager: Marlin Chen)

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC, NVLAP
Japan	:	VCCI
China	:	CNAS

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

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

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yongxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

Linkou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

Description	Page
1. General Information	6
1.1. EUT Description	6
1.2. Mode of Operation	7
1.3. Tested System Details	8
1.4. Configuration of Tested System	9
1.5. EUT Exercise Software	10
2. Technical Test	11
2.1. Summary of Test Result	11
2.2. Test Environment	12
3. Maximum Conducted Output Power	13
3.1. Test Equipment	13
3.2. Test Setup	13
3.3. Limit.....	13
3.4. Test Procedure	14
3.5. Uncertainty	14
3.6. Test Result	15
4. Peak Power Spectral Density.....	22
4.1. Test Equipment	22
4.2. Test Setup	22
4.3. Limit.....	22
4.4. Test Procedure	23
4.5. Uncertainty	23
4.6. Test Result	24
5. Occupied Bandwidth	31
5.1. Test Equipment	31
5.2. Test Setup	31
5.3. Limit.....	31
5.4. Test Procedure	32
5.5. Uncertainty	32
5.6. Test Result	33
6. Emission Masks.....	37
6.1. Test Equipment	37
6.2. Test Setup	37
6.3. Limit.....	37
6.4. Test Procedure	38
6.5. Uncertainty	38
6.6. Test Result	39

7.	Spurious RF Conducted Emission	43
7.1.	Test Equipment	43
7.2.	Test Setup	43
7.3.	Limit.....	43
7.4.	Test Procedure	44
7.5.	Uncertainty	44
7.6.	Test Result	45
8.	Radiated Emission	49
8.1.	Test Equipment	49
8.2.	Test Setup	50
8.3.	Limit.....	51
8.4.	Test Procedure	51
8.5.	Uncertainty	51
8.6.	Test Result	52
9.	Peak Excursion	54
9.1.	Test Equipment	54
9.2.	Test Setup	54
9.3.	Limit.....	54
9.4.	Test Procedure	54
9.5.	Uncertainty	55
9.6.	Test Result	56
10.	Frequency Stability	60
10.1.	Test Equipment	60
10.2.	Test Setup	60
10.3.	Limit.....	60
10.4.	Test Procedure	61
10.5.	Uncertainty	61
10.6.	Test Result	62

1. General Information

1.1. EUT Description

Product Name	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Brand Name	KBC
Model No.	WLM200N5-23-4.9
Working Voltage	DC 3.3V
Frequency Range	4960~4980
Channel Number	2
Channel Separation	20MHz
Type of Modulation	OFDM
Data Rate	up to 300 Mbps
Channel Control	Auto
Antenna Type	Directional Antenna
Peak Antenna Gain	Reference to Antenna List

Note: This module is belong to low power device.

Antenna List

Antenna	Manufacturer	M/N	Peak Gain
Directional Antenna	COMPEX	N/A	4.9GHz: 17dBi

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit

Note:

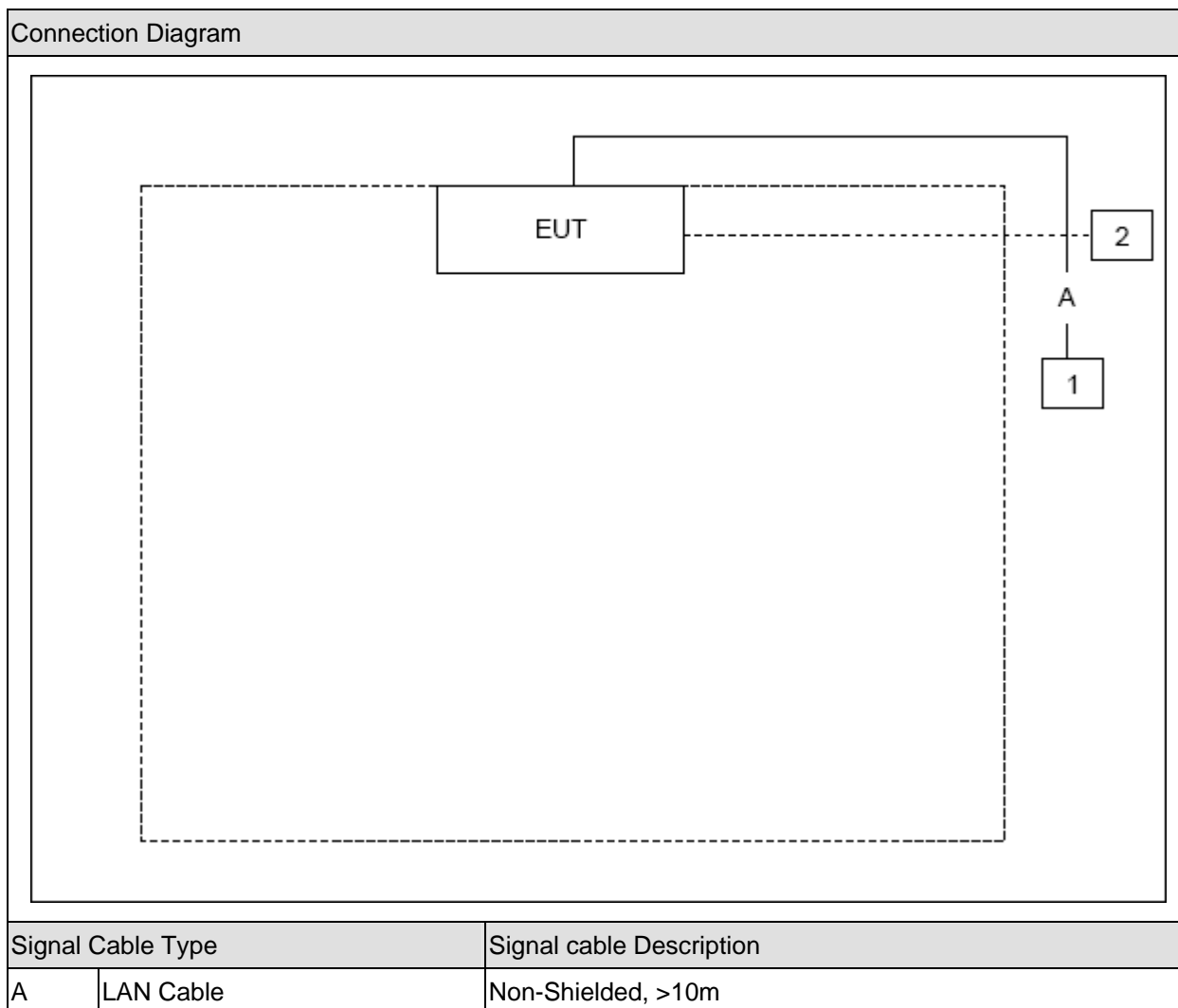
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

1.3. Tested System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	PP19L	JH097 A01	N/A
2	Laptop PC	Asus	N80V	8BN0AS226971468	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Run the RF test software "BRICKS", and set the test mode and channel, then press OK to start continue transmit.

2. Technical Test

2.1. Summary of Test Result

No deviations from the test standards

Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Maximum conducted Output Power	FCC CFR Title 47 Part 90 Subpart Y: 2011 Section 90.1215(a)	Yes	No
Peak Power Spectral Density	FCC CFR Title 47 Part 90 Subpart Y: 2011 Section 90.1215(a)	Yes	No
26dB Occupied Bandwidth	FCC CFR Title 47 Part 90 Subpart I: 2011 Section 90.209	Yes	No
Emission Masks	FCC CFR Title 47 Part 90 Subpart I: 2011 Section 90.210	Yes	No
Spurious RF Conducted Emissions	FCC CFR Title 47 Part 90 Subpart I: 2011 Section 90.210	Yes	No
Radiated Emission	FCC CFR Title 47 Part 90 Subpart I: 2011 Section 90.210	Yes	No
Peak Excursion	FCC CFR Title 47 Part 90 Subpart Y: 2011 Section 90.1215(e)	Yes	No
Frequency Stability	FCC CFR Title 47 Part 90 Subpart I: 2011 Section 90.213	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Maximum Conducted Output Power

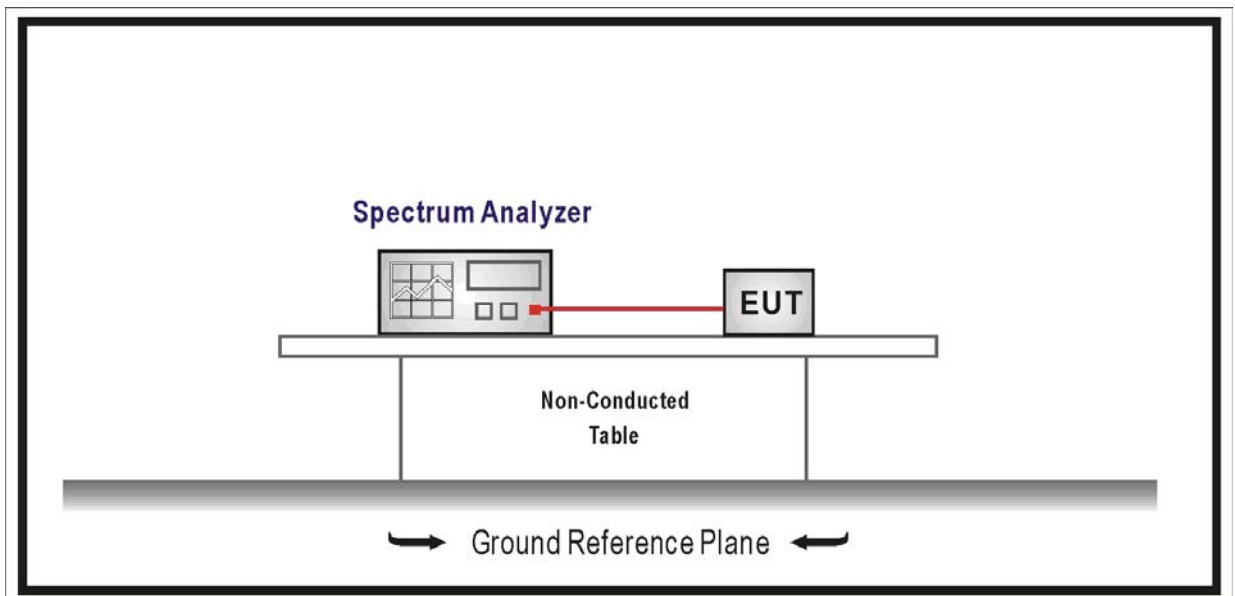
3.1. Test Equipment

Maximum Conducted Output Power / TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

The maximum conducted out-put power should not exceed:

Channel bandwidth (MHz)	Low power maximum conducted output power (dBm)	High power maximum conducted output power (dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33

If transmitting antennas of directional gain greater than 9dBi are used, the maximum conducted output power should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9dBi.

3.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C Section 2.2.1 and KDB 971168.

3.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

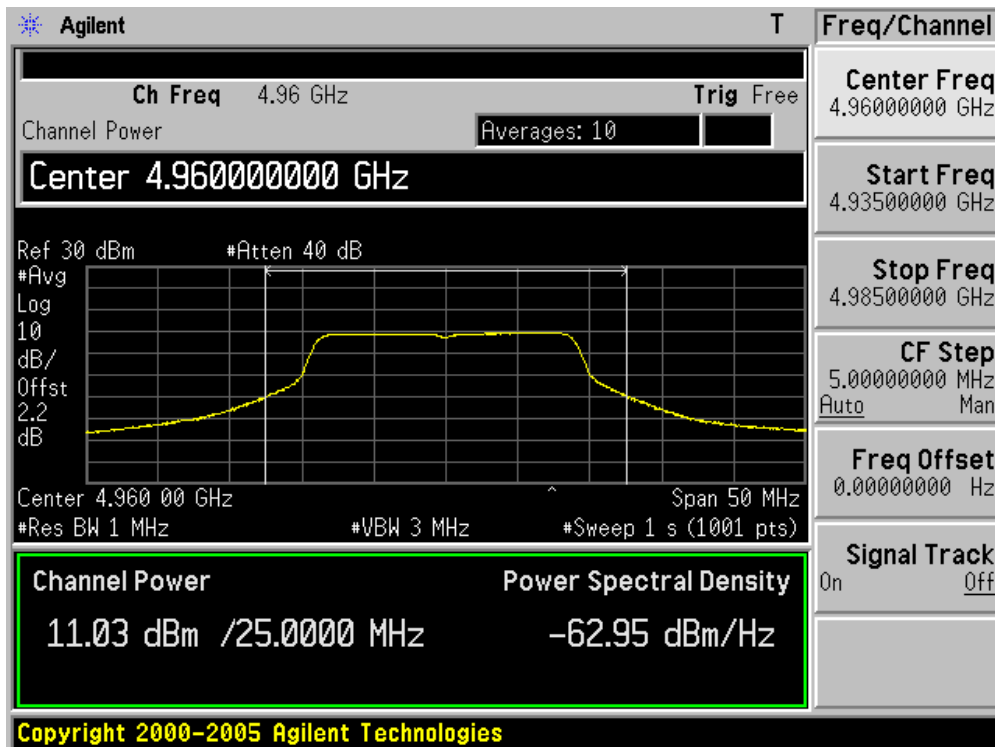
3.6. Test Result

Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Maximum Conducted Output Power
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 100)

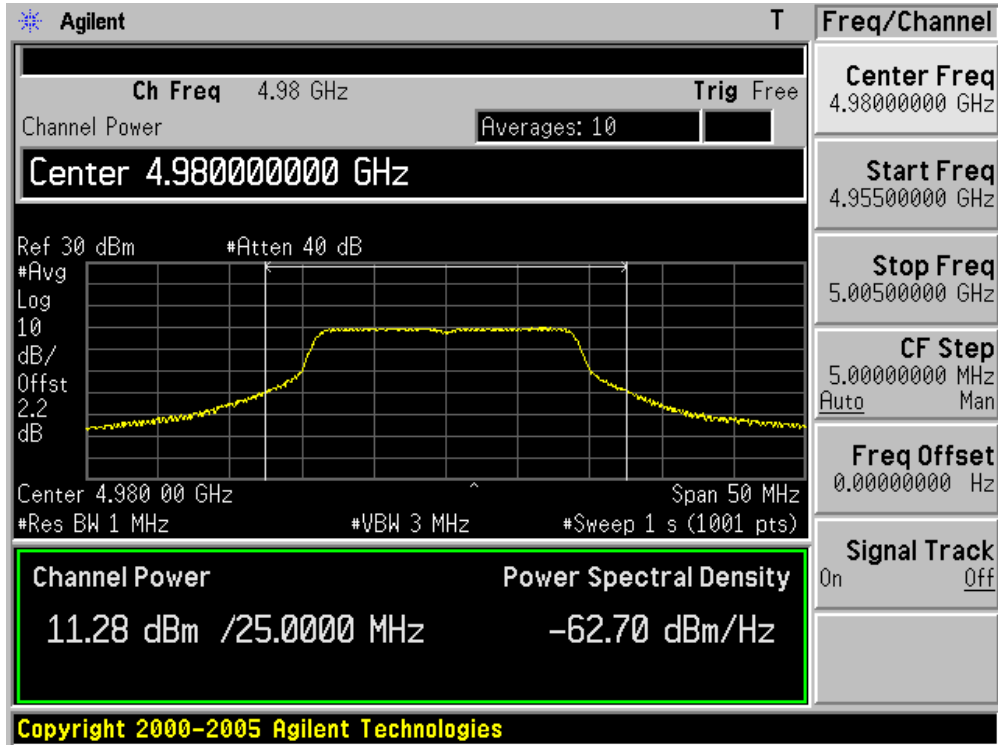
Channel No.	Frequency (MHz)	Maximum Conducted Output Power (dBm)		Limit (dBm)
		Chain 100	Chain 010	
01	4960	11.03	N/A	12
02	4980	11.28	N/A	12

Note: Limit = 20dBm – (17dBi – 9dBi) = 12dBm;

Channel 01 (4960MHz)



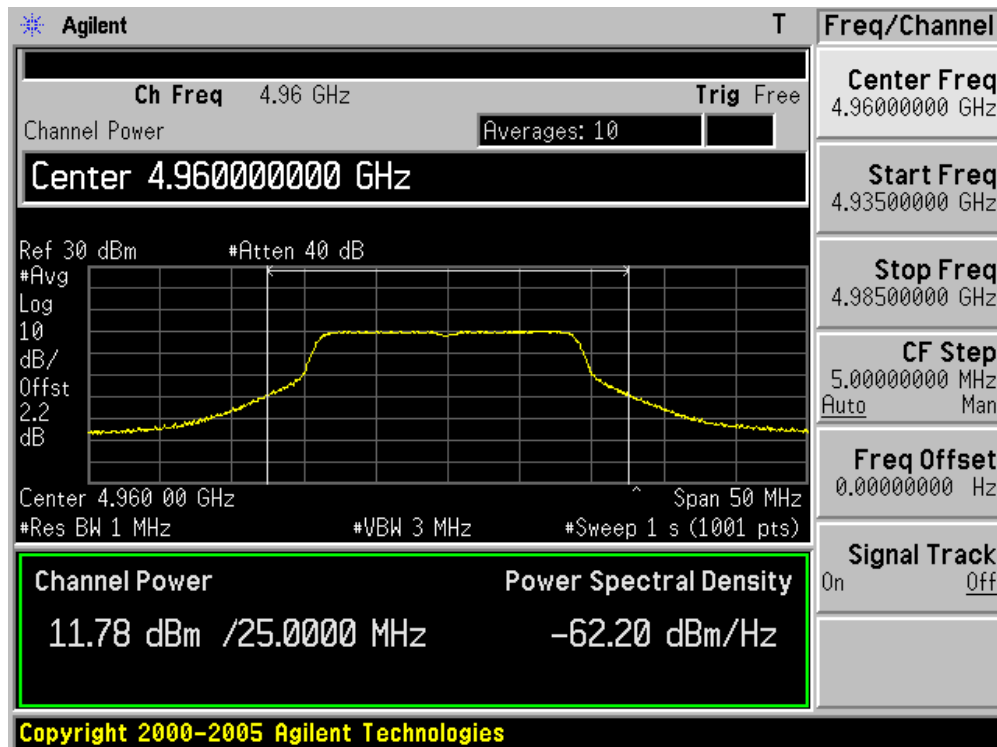
Channel 02 (4980MHz)



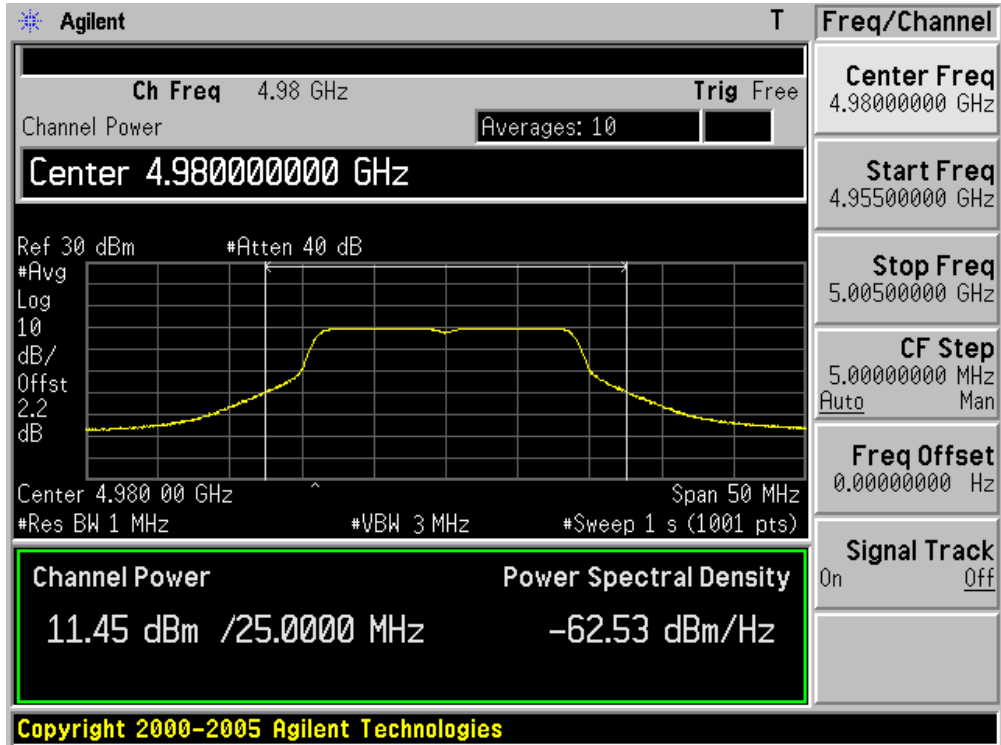
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Maximum Conducted Output Power
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 010)

Channel No.	Frequency (MHz)	Maximum Conducted Output Power (dBm)		Limit (dBm)
		Chain 100	Chain 010	
01	4960	N/A	11.78	12
02	4980	N/A	11.45	12

Channel 01 (4960MHz)



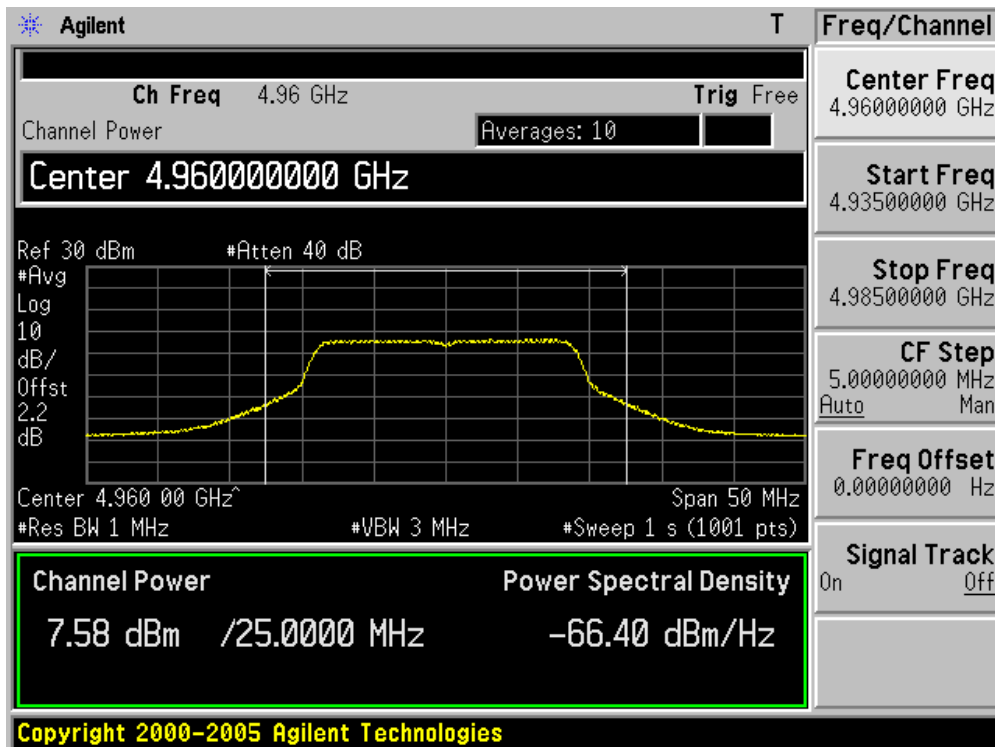
Channel 02 (4980MHz)



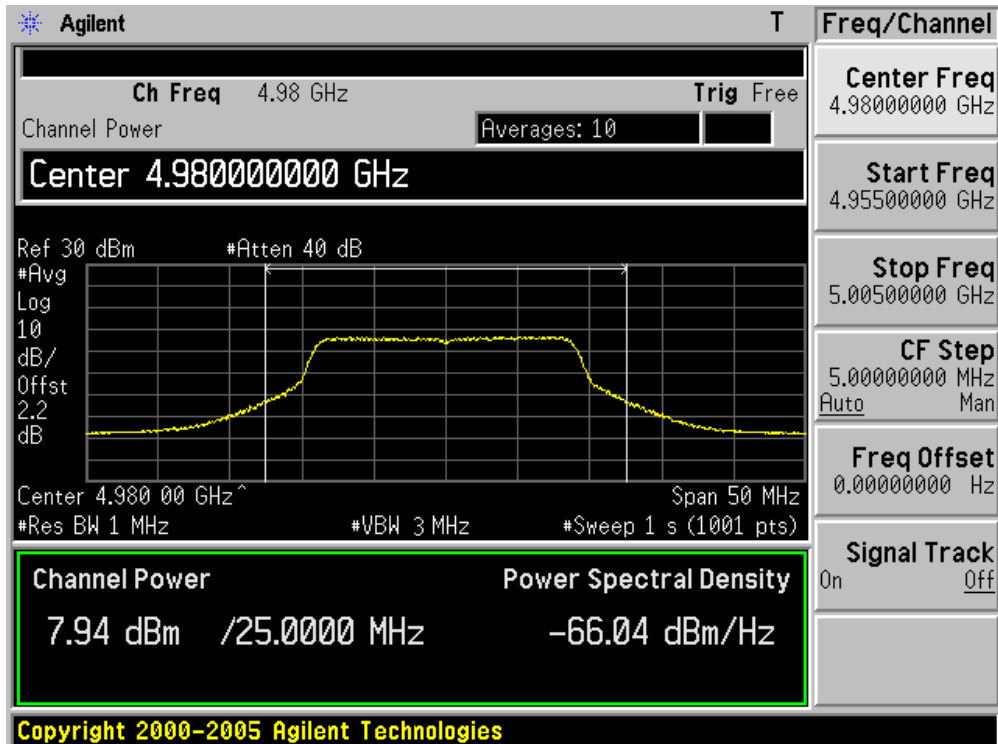
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Maximum Conducted Output Power
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 110)

Channel No.	Frequency (MHz)	Peak Output Power (dBm)		Total Power (dBm)	Limit (dBm)
		Chain 100	Chain 010		
01	4960	7.58	7.57	10.59	12
02	4980	7.94	7.61	10.79	12

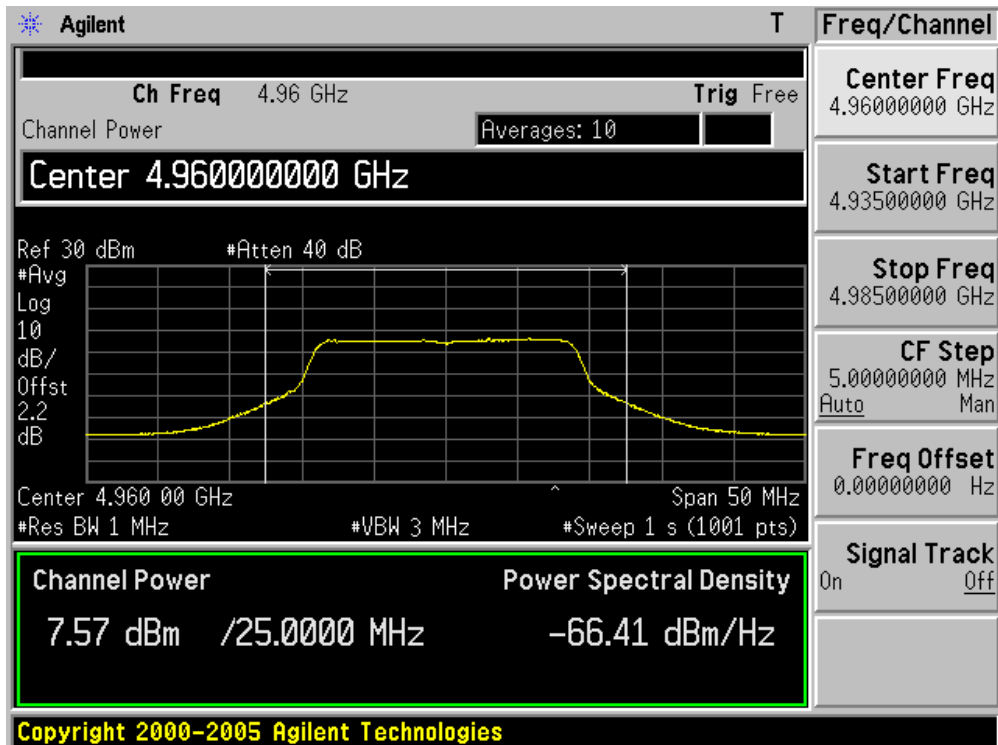
Channel 01 (4960MHz) Chain 100



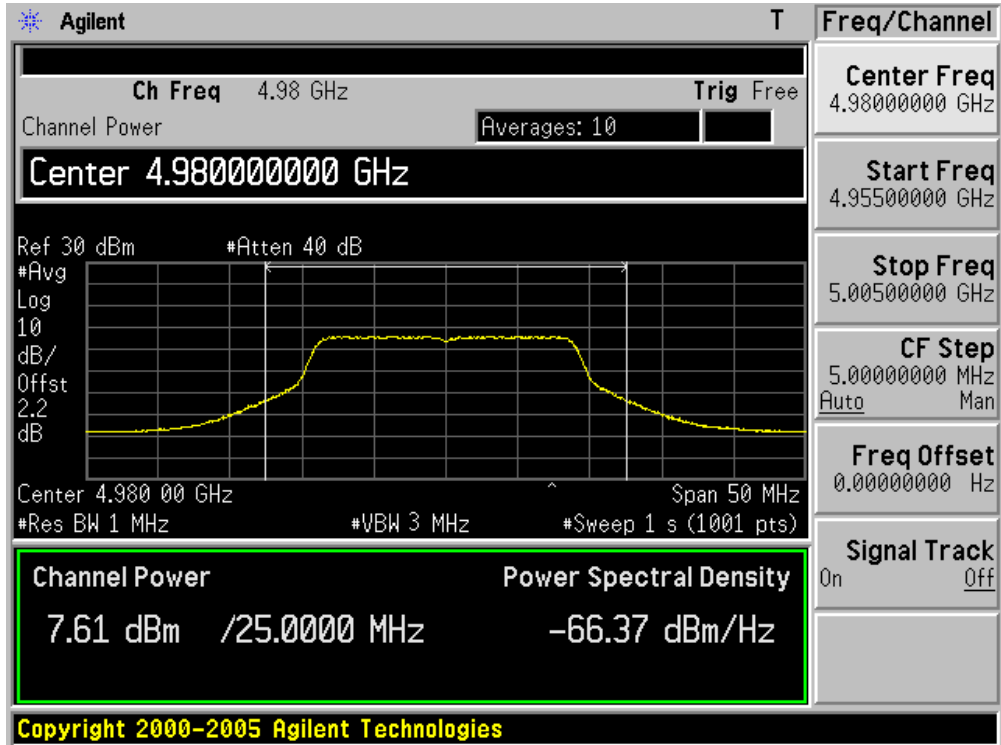
Channel 02 (4980MHz) Chain 100



Channel 01 (4960MHz) Chain 010



Channel 02 (4980MHz) Chain 010



4. Peak Power Spectral Density

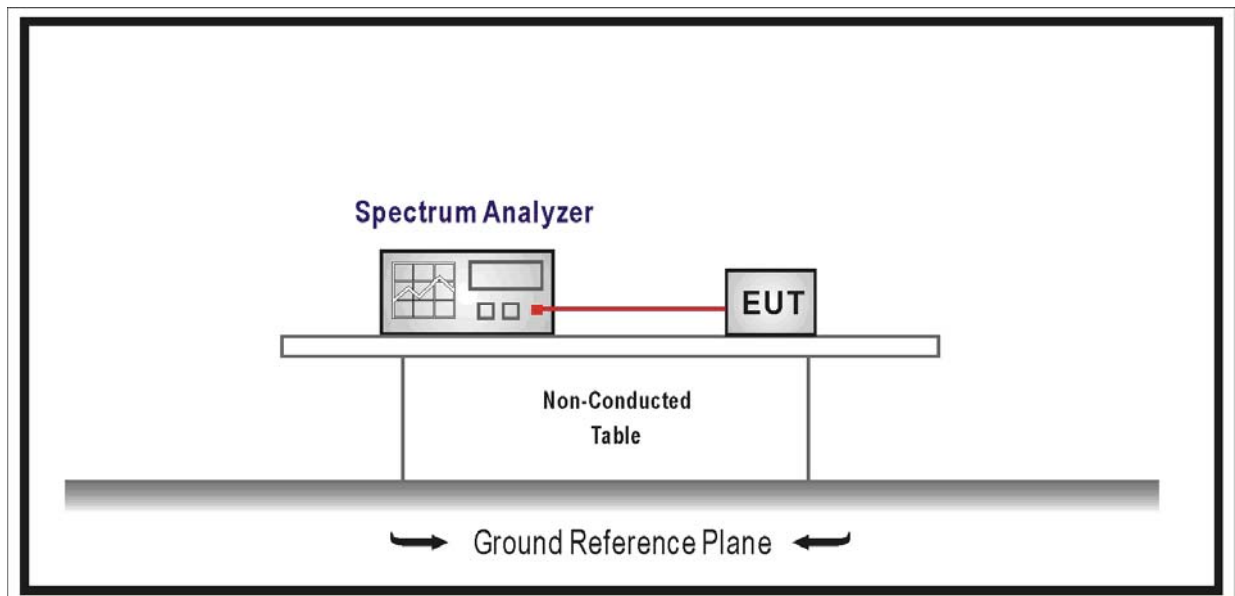
4.1. Test Equipment

Peak Power Spectral Density / TR8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup



4.3. Limit

Low power devices are also limited to a peak power spectral density of 8dBm per one MHz. Low power devices using channel bandwidths other than those listed above are permitted; however, they are limited to a peak power spectral density of 8dBm/MHz. If transmitting antennas of directional gain greater than 9dBi are used, the peak power spectral density should be reduced by the amount in decibels that the directional gain of the antenna exceeds 9dBi.

4.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C and KDB 971168.

4.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

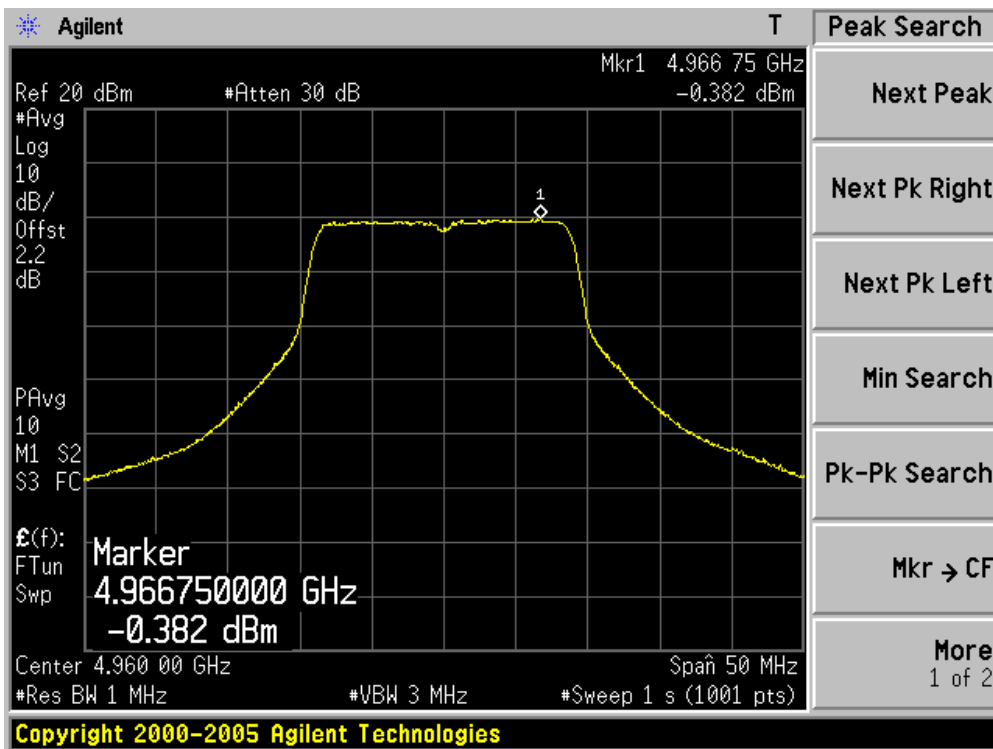
4.6. Test Result

Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 100)

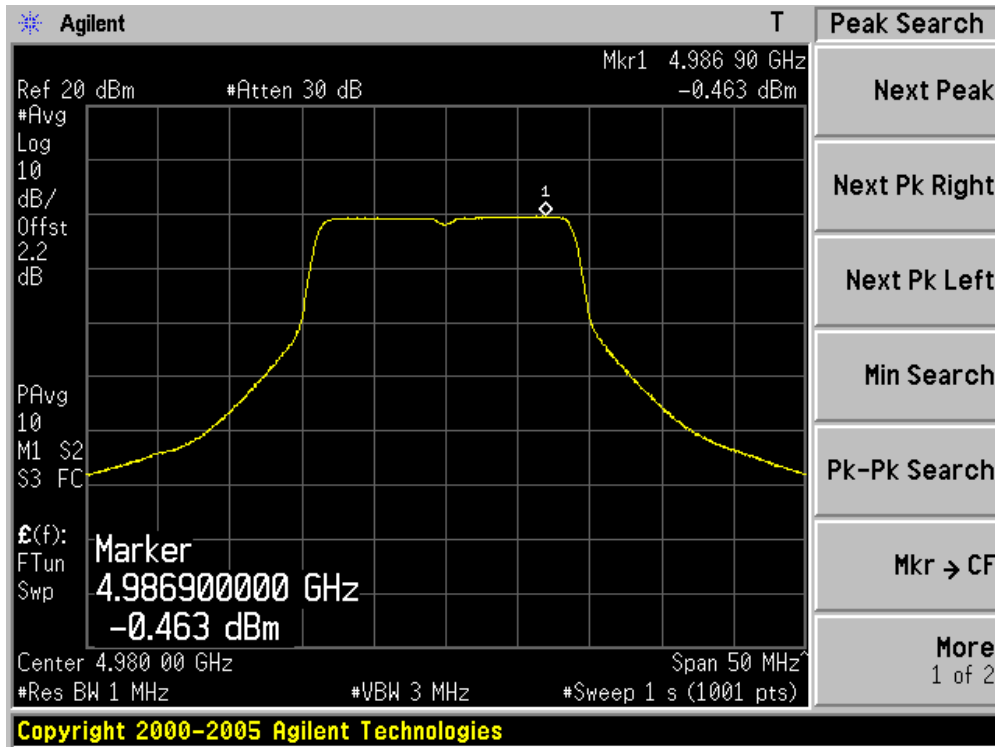
Channel No.	Frequency (MHz)	Peak Power Spectral Density (dBm)		Limit (dBm)
		Chain 100	Chain 010	
01	4960	-0.38	N/A	0
02	4980	-0.46	N/A	0

Note: Limit = 8dBm – (17dBi – 9dBi) = 0dBm;

Channel 01 (4960MHz)



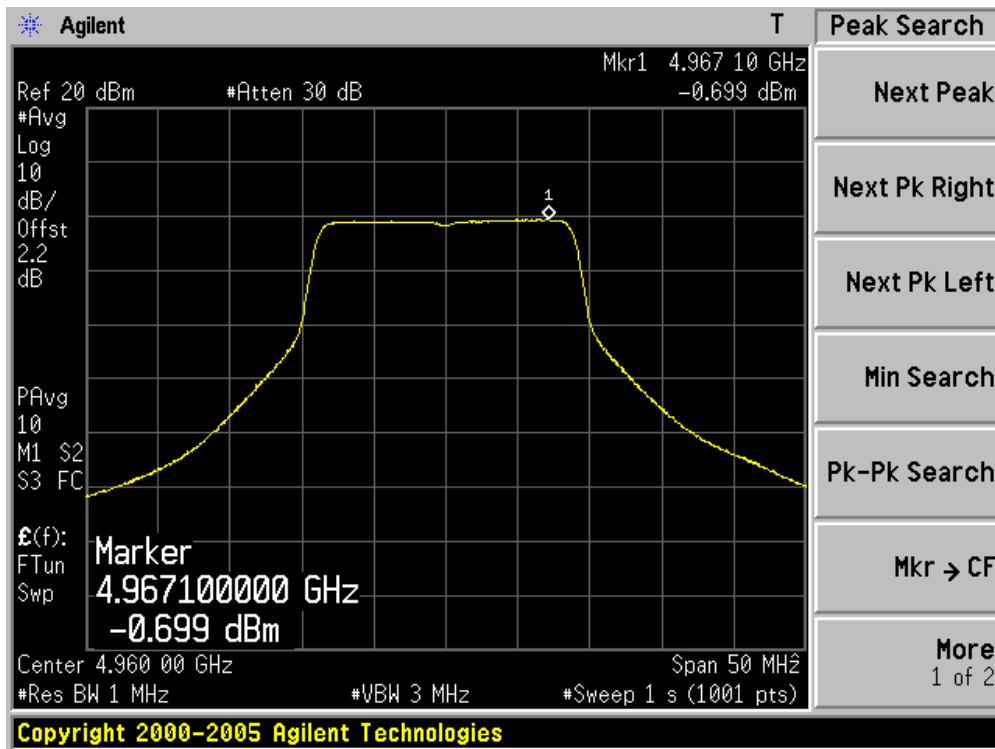
Channel 02 (4980MHz)



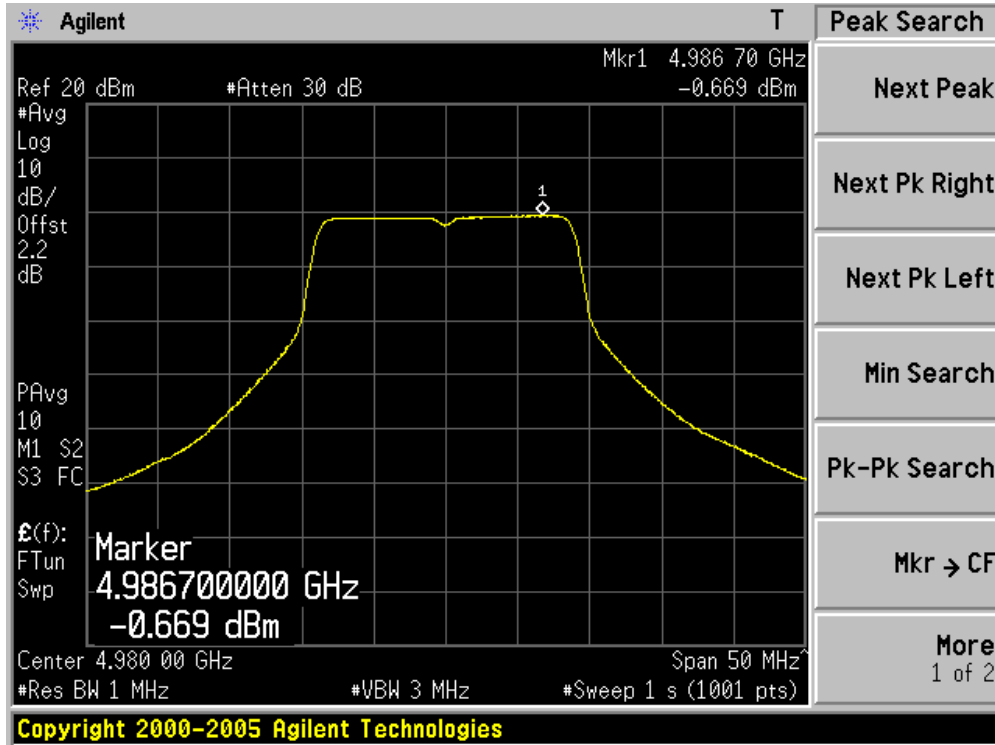
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 010)

Channel No.	Frequency (MHz)	Peak Power Spectral Density (dBm)		Limit (dBm)
		Chain 100	Chain 010	
01	4960	N/A	-0.70	0
02	4980	N/A	-0.67	0

Channel 01 (4960MHz)



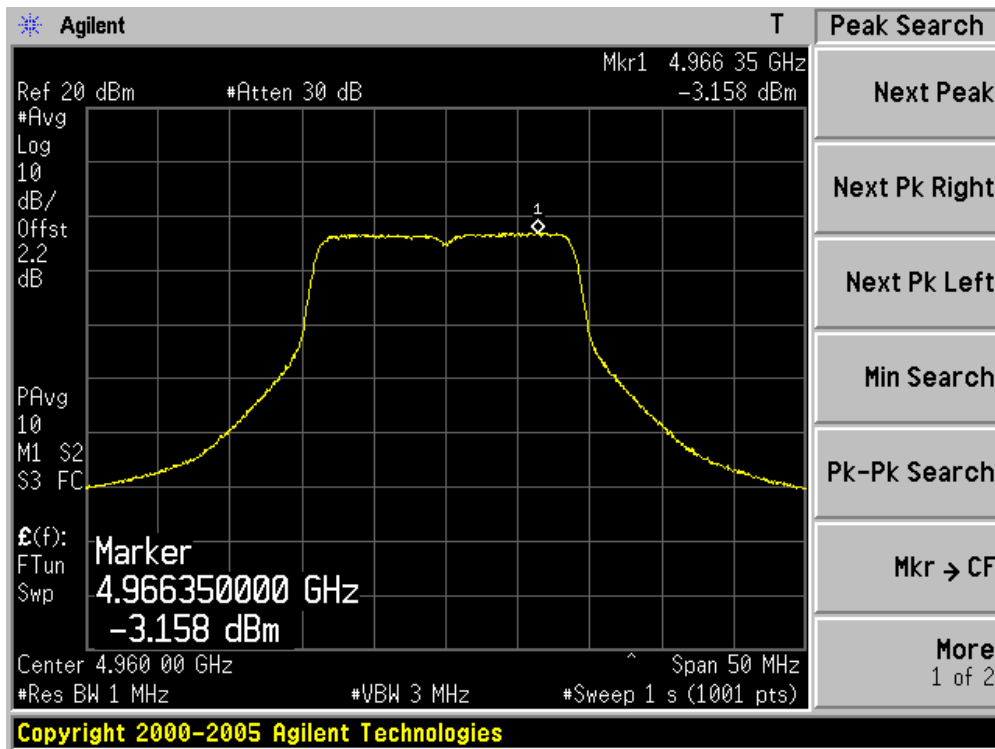
Channel 02 (4980MHz)



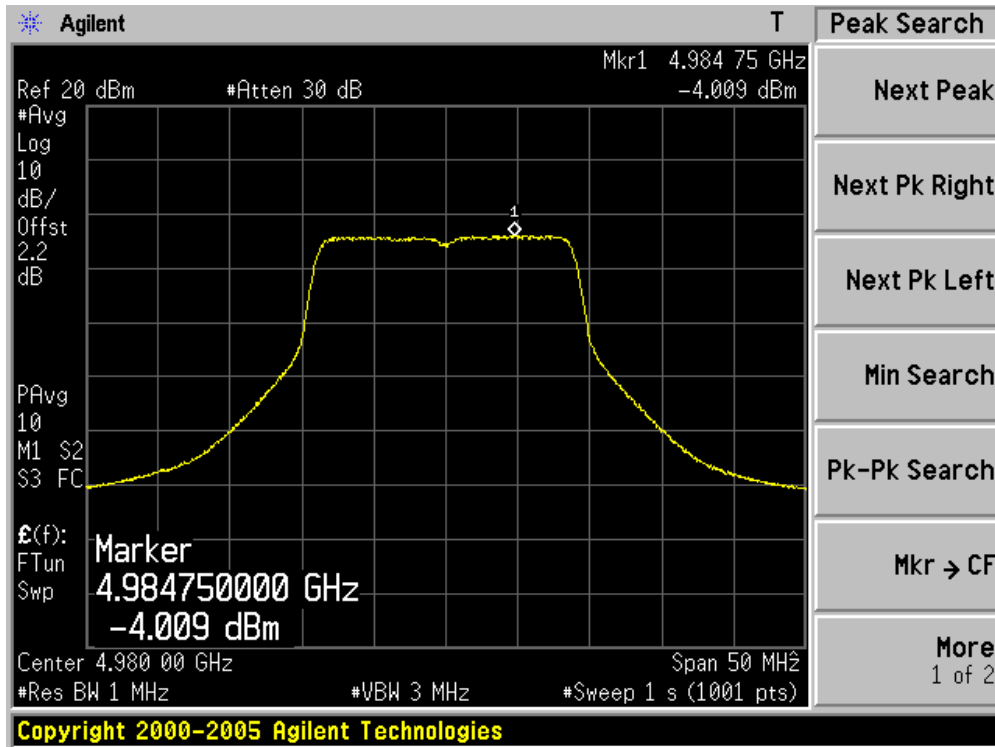
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Peak Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 110)

Channel No.	Frequency (MHz)	Peak Power Spectral Density (dBm)		Total Power (dBm)	Limit (dBm)
		Chain 100	Chain 010		
01	4960	-3.16	-3.12	-0.65	0
02	4980	-4.01	-4.37	-0.72	0

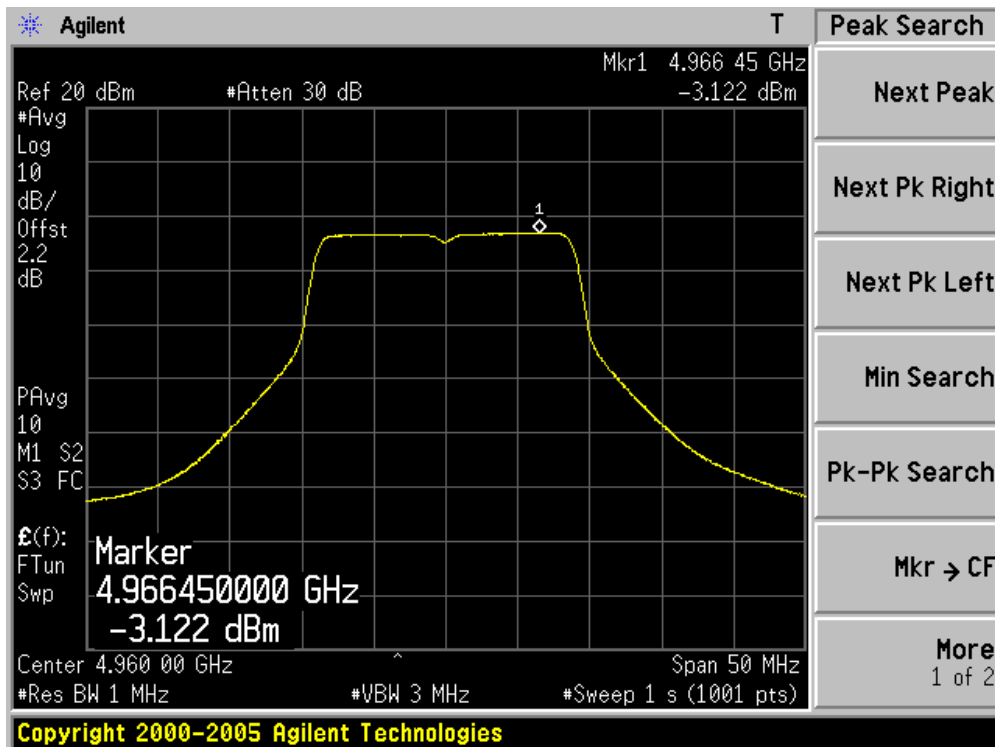
Channel 01 (4960MHz) Chain 100



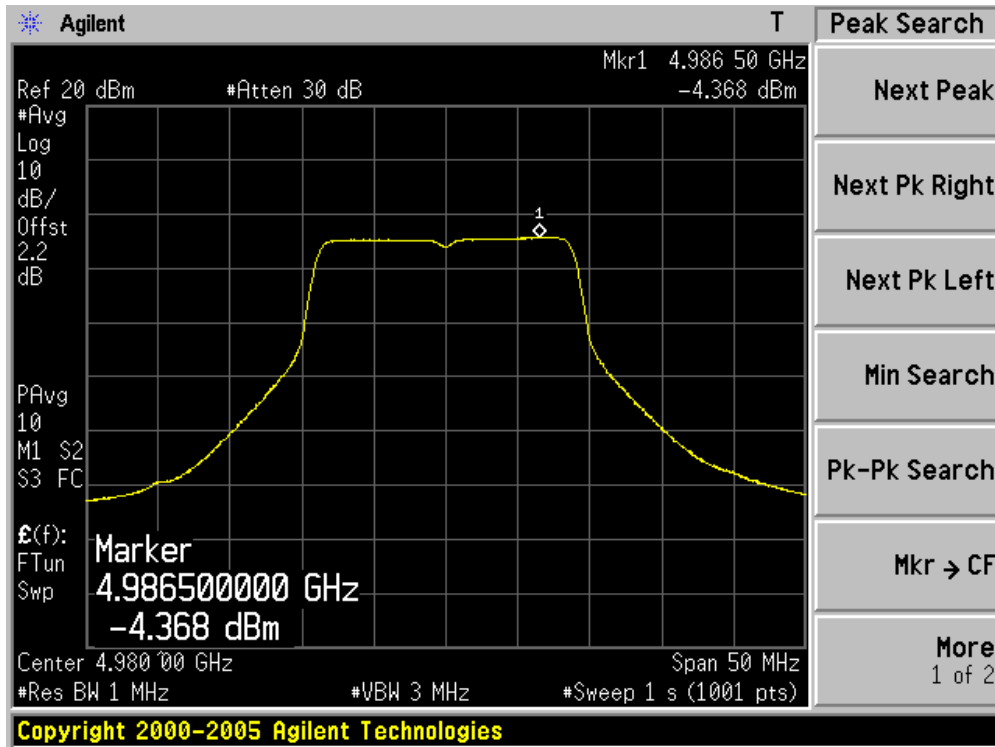
Channel 02 (4980MHz) Chain 100



Channel 02 (4960MHz) Chain 010



Channel 02 (4980MHz) Chain 010



5. Occupied Bandwidth

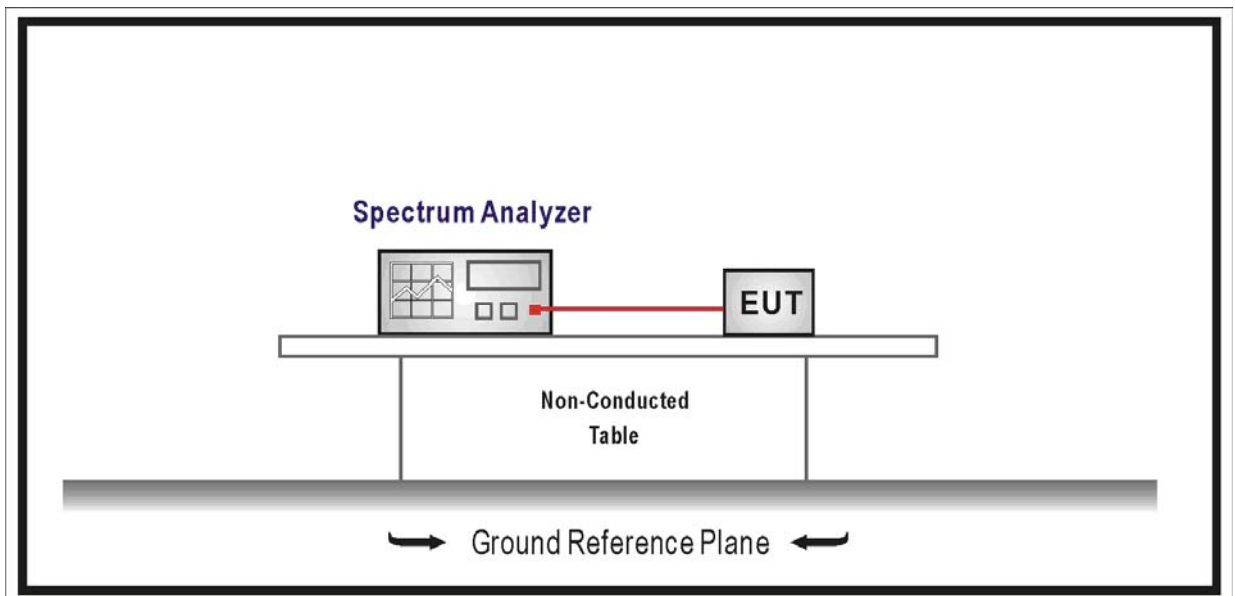
5.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

Channel bandwidth (MHz)	Low power maximum conducted output power (dBm)	High power maximum conducted output power (dBm)
1	7	20
5	14	27
10	17	30
15	18.8	31.8
20	20	33

The channel bandwidth shall not exceed 20 MHz;

5.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C and KDB 971168.

5.5. Uncertainty

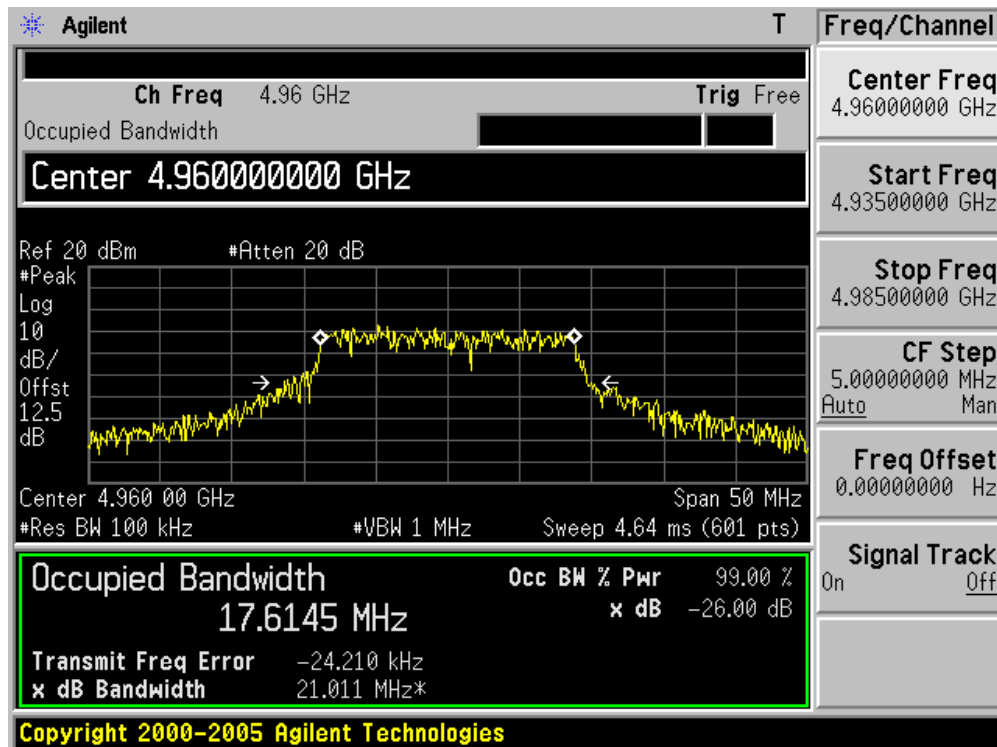
The measurement uncertainty is defined as ± 1 kHz

5.6. Test Result

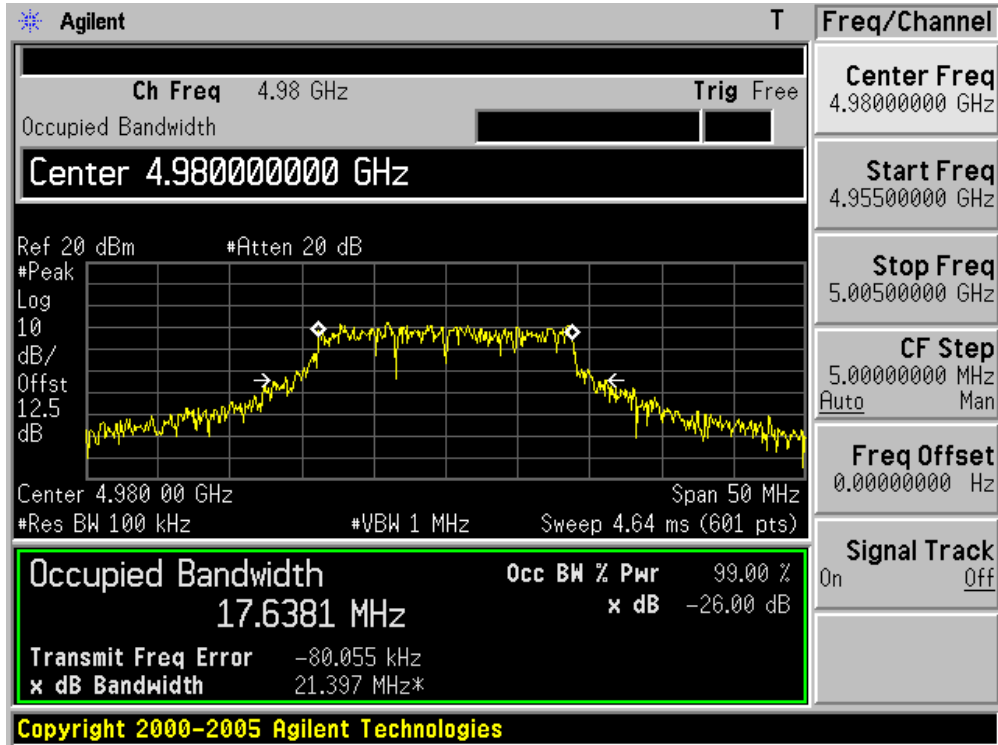
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 100)

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)
01	4960	17.615
02	4980	17.638

Channel 01 (4960MHz)



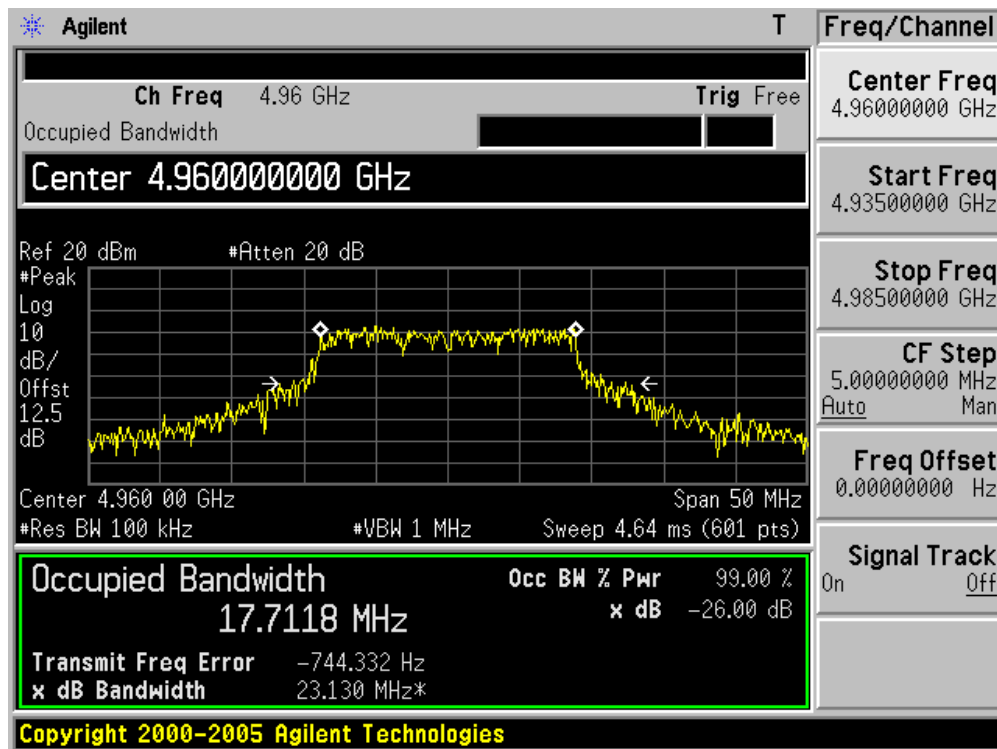
Channel 02 (4980MHz)



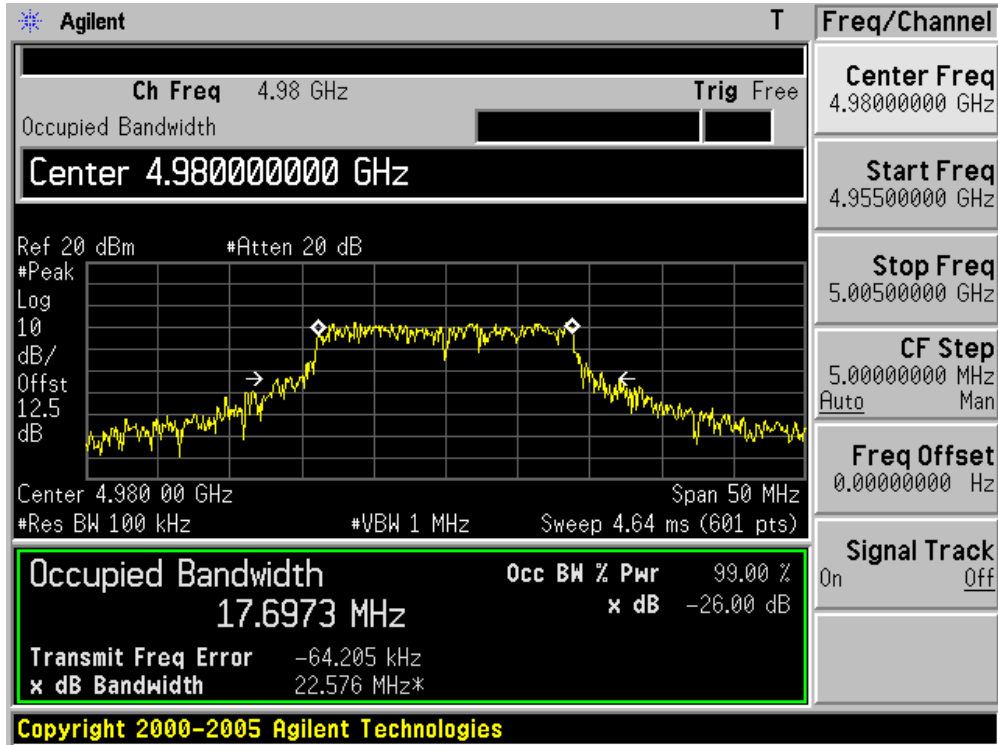
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 010)

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)
01	4960	17.712
02	4980	17.697

Channel 01 (4960MHz)



Channel 02 (4980MHz)



6. Emission Masks

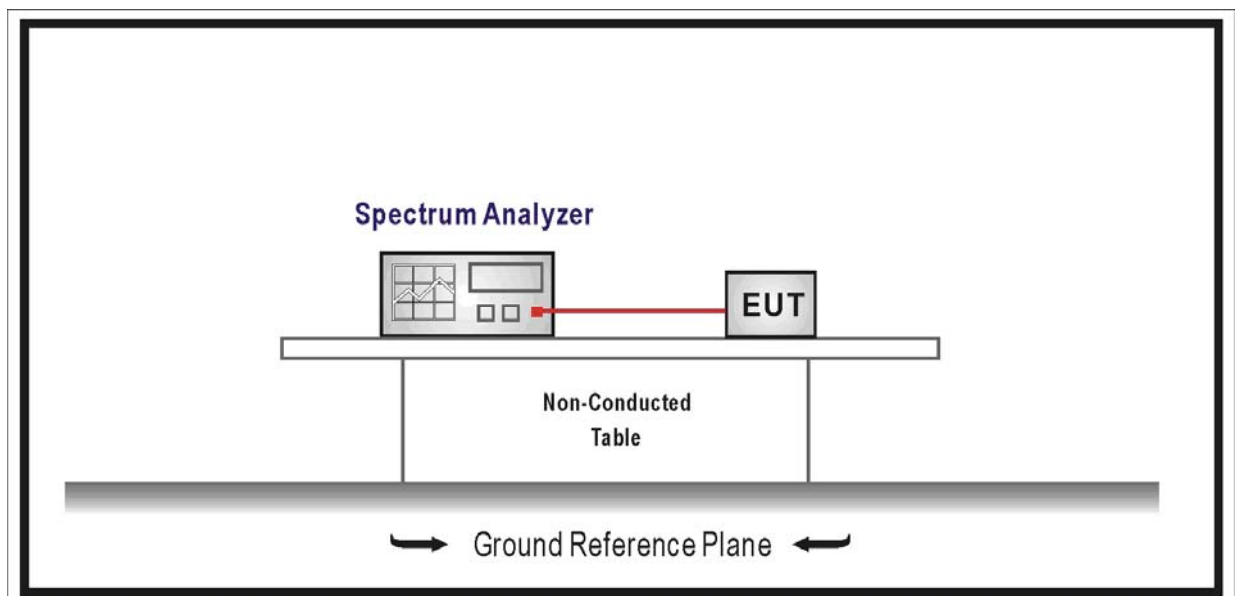
6.1. Test Equipment

Emission Masks / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

Emission Mask L. For low power transmitters (20 dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

- (1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB.
- (2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: $219 \log (\% \text{ of } (BW)/45)$ dB.
- (3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: $10 + 242 \log (\% \text{ of } (BW)/50)$ dB.

- (4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: $20 + 31 \log (\% \text{ of } (BW)/55)$ dB attenuation.
- (5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: $28 + 68 \log (\% \text{ of } (BW)/100)$ dB attenuation.
- (6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40 dB.
- (7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

6.4. Test Procedure

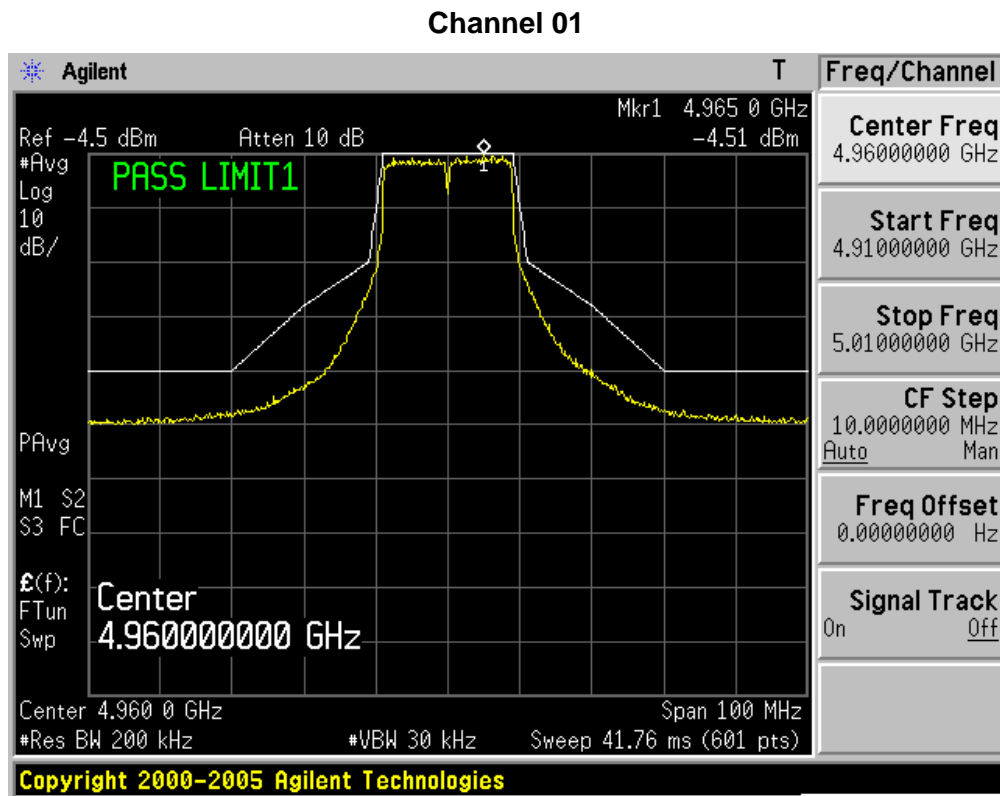
The EUT was tested according to ANSI TIA-603-C Section 2.2.11.

6.5. Uncertainty

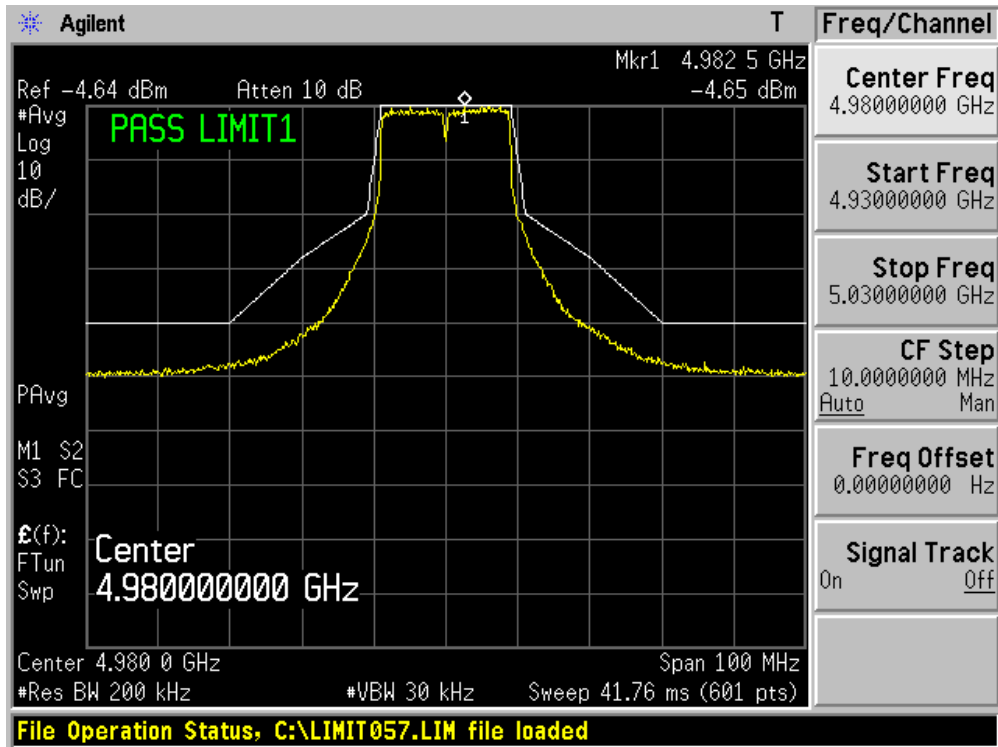
The measurement uncertainty is defined as ± 1.27 dB

6.6. Test Result

Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Emission Masks
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter(Chain 100)

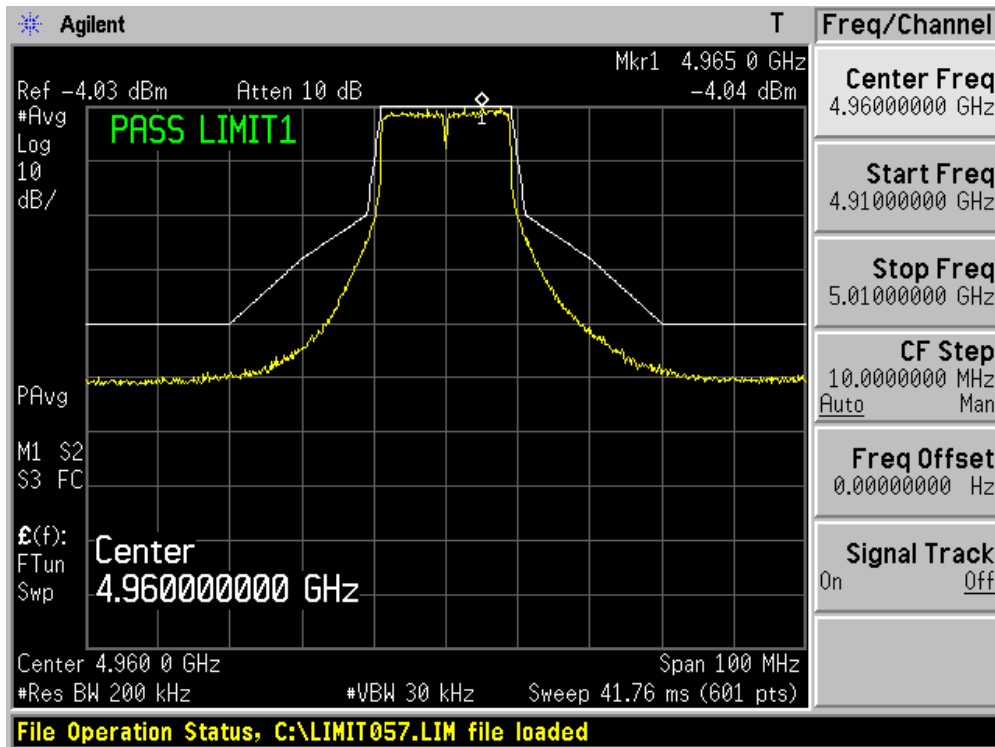


Channel 02

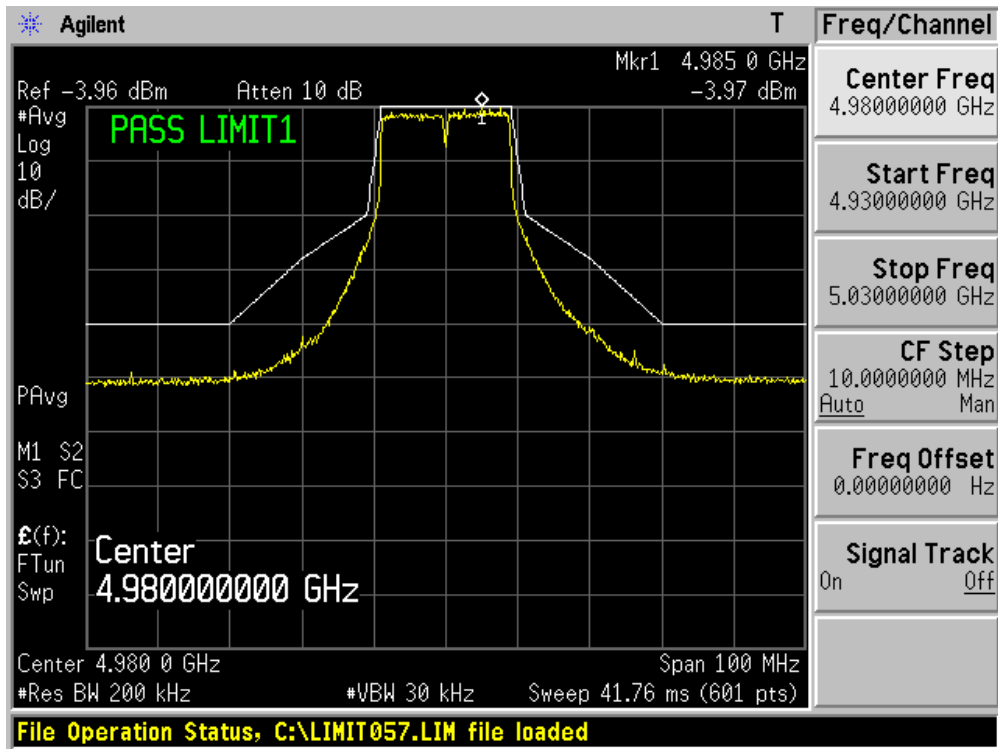


Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Emission Masks
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmitter(Chain 010)

Channel 01



Channel 02



7. Spurious RF Conducted Emission

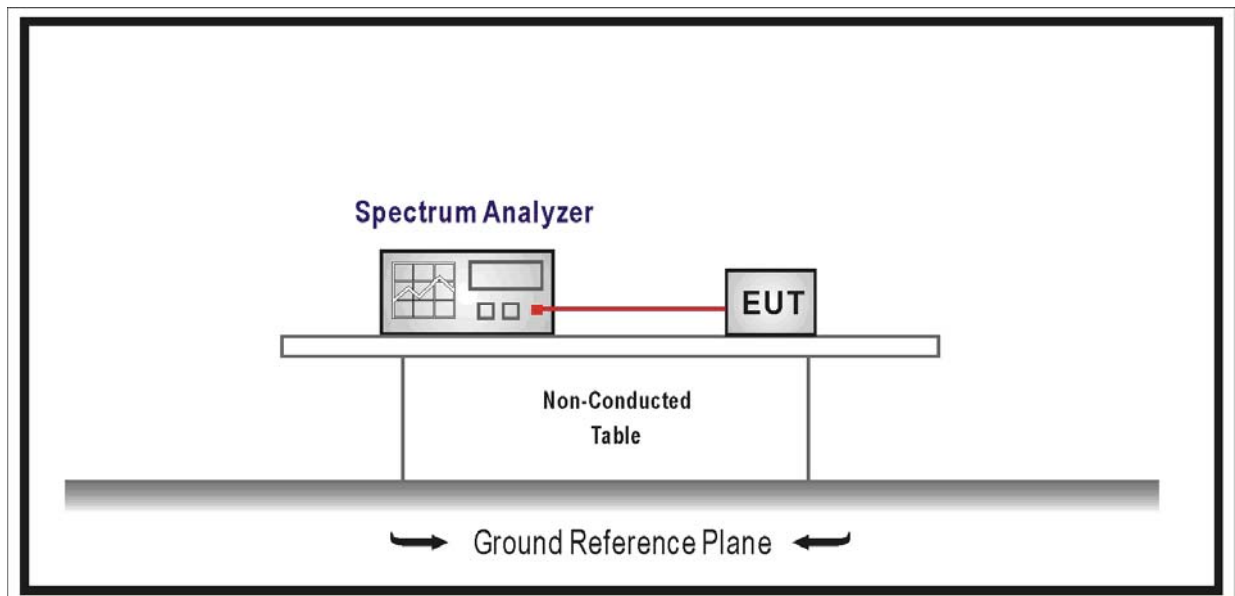
7.1. Test Equipment

Spurious RF Conducted Emission / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

For low power transmitters (20dBm or less) operating in the 4940–4990MHz frequency band.
On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40dB.

For high power transmitters (greater than 20dBm) operating in the 4940–4990MHz frequency band.

On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 50dB or $55 + 10\log(P)$ dB, whichever is the lesser attenuation.

7.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C Section 2.2.13.

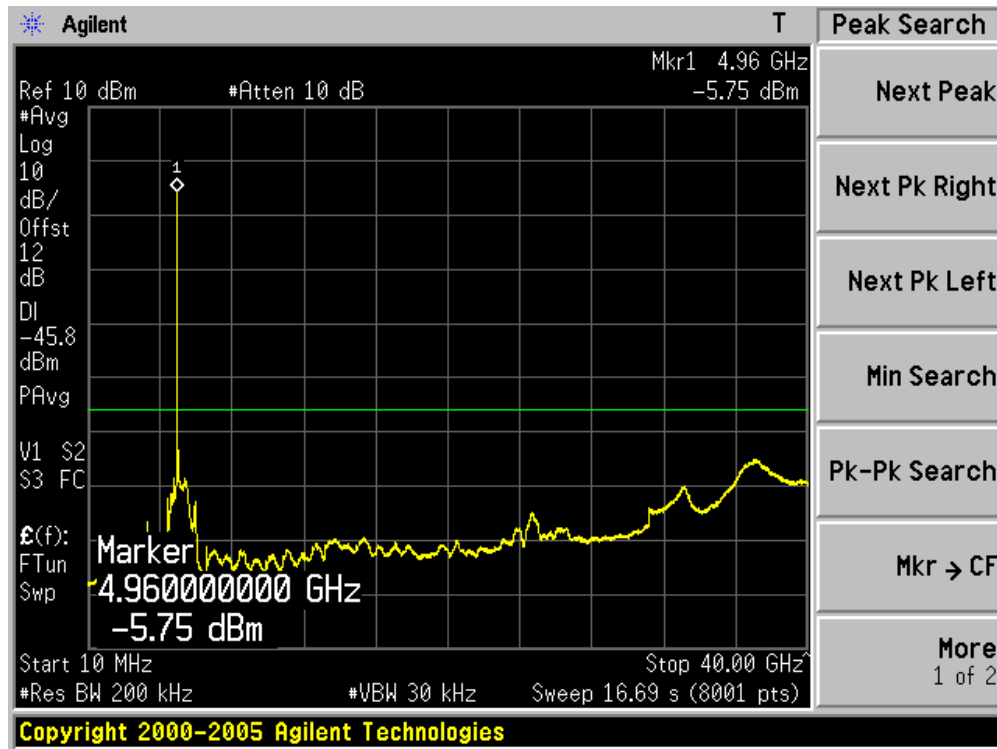
7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

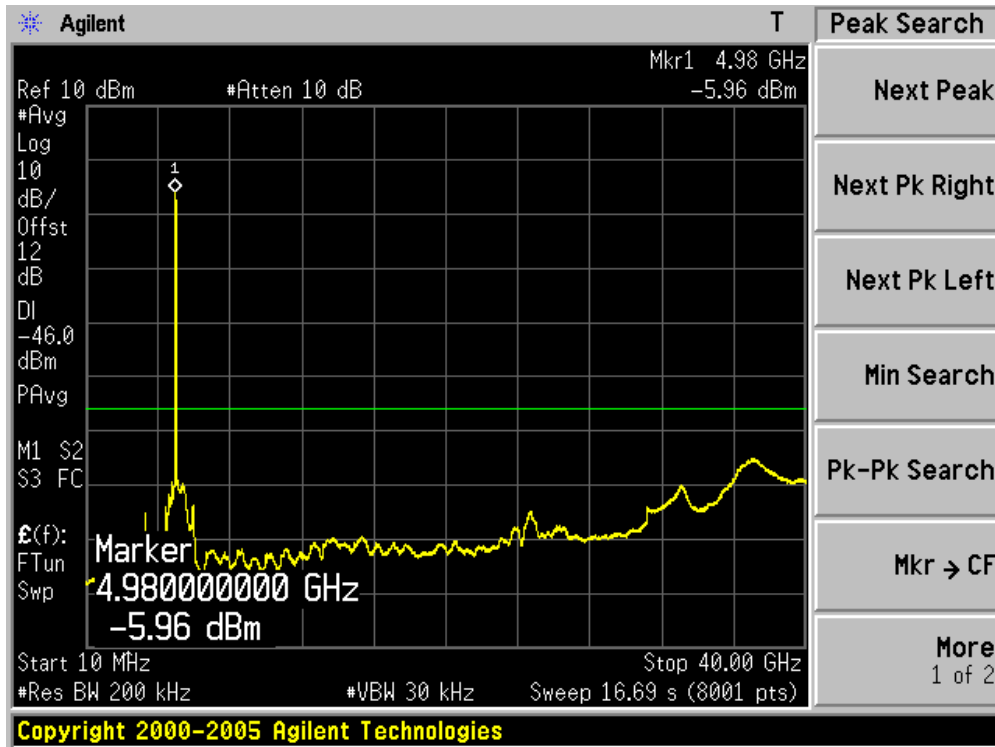
7.6. Test Result

Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Spurious RF Conducted Emission
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 100)

Channel 01

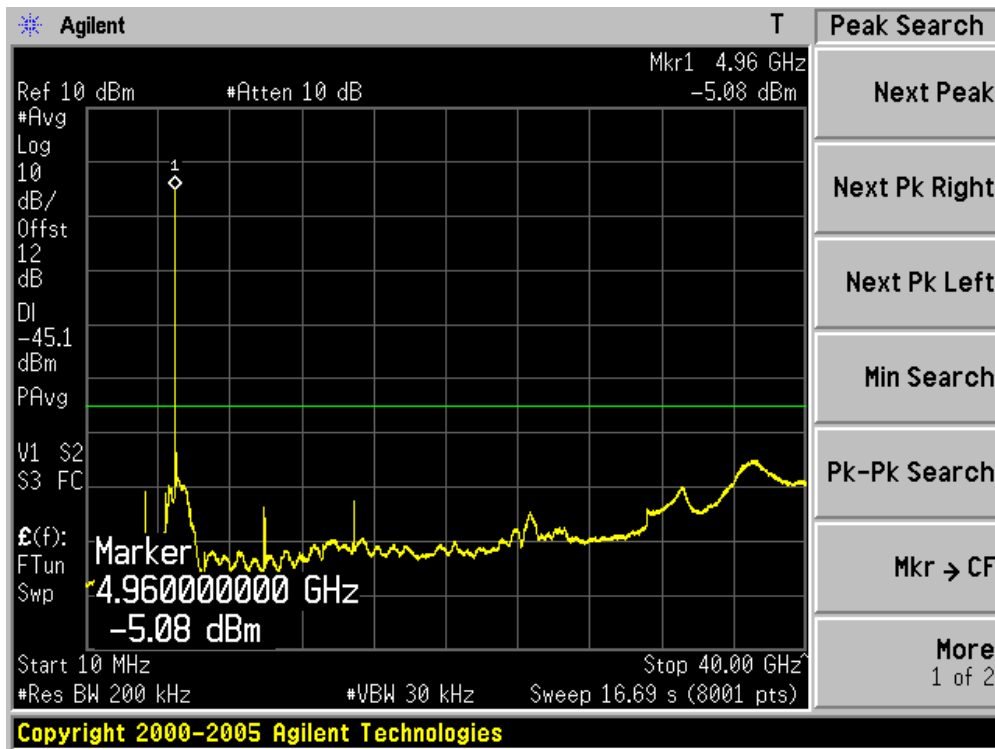


Channel 02

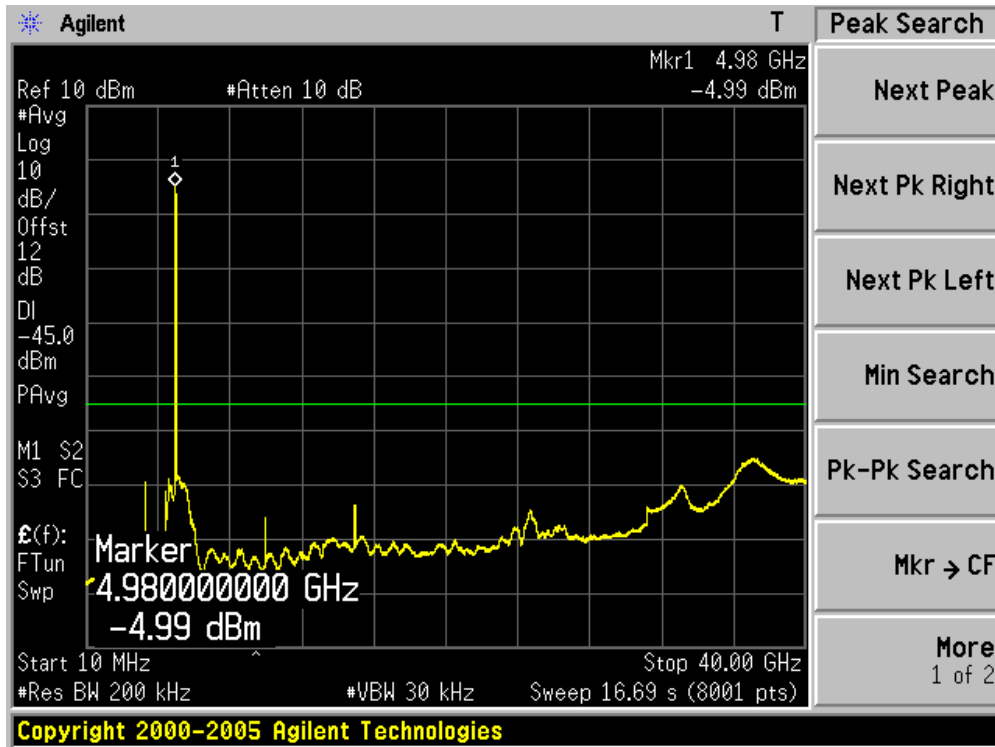


Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Spurious RF Conducted Emission
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 010)

Channel 01



Channel 02



8. Radiated Emission

8.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2013.04.18
Loop Antenna	R&S	HFH2-Z2	833799/003	2012.11.22
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2012.10.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2013.01.10

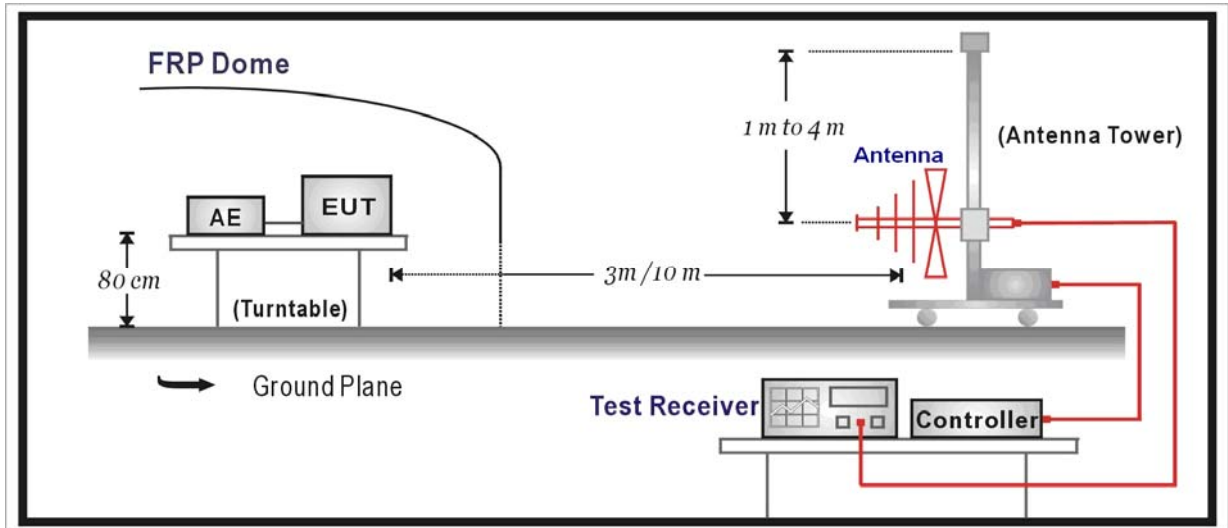
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2013.04.18
Preamplifier	Quietek	AP-025C	CHM-0602008	2013.04.11
Preamplifier	Miteq	NSP1800-25	1364185	2013.05.04
Preamplifier	Quietek	AP-040G	CHM-0906001	2013.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2012.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2014.06.08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2013.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2013.03.02
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2013.03.02
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2013.01.10

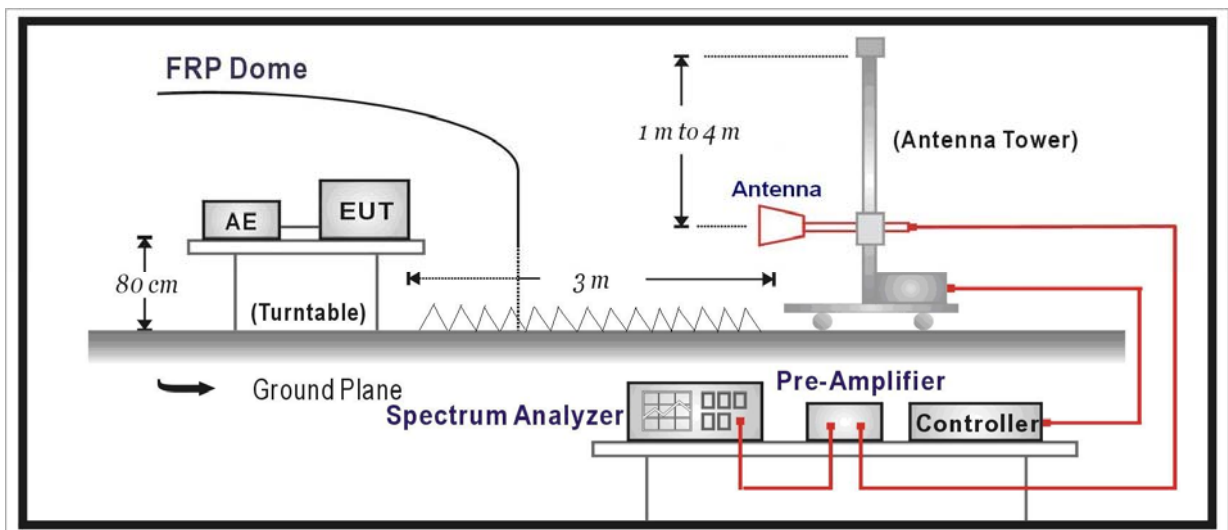
Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



8.3. Limit

Emission Mask L. For low power transmitters (20dBm or less) operating in the 4940–4990 MHz frequency band, the power spectral density of the emissions must be attenuated below the output power of the transmitter as follows:

- (1) On any frequency removed from the assigned frequency between 0–45% of the authorized bandwidth (BW): 0 dB.
- (2) On any frequency removed from the assigned frequency between 45–50% of the authorized bandwidth: $219 \log (\% \text{ of (BW)/45})$ dB.
- (3) On any frequency removed from the assigned frequency between 50–55% of the authorized bandwidth: $10 + 242 \log (\% \text{ of (BW)/50})$ dB.
- (4) On any frequency removed from the assigned frequency between 55–100% of the authorized bandwidth: $20 + 31 \log (\% \text{ of (BW)/55})$ dB attenuation.
- (5) On any frequency removed from the assigned frequency between 100–150% of the authorized bandwidth: $28 + 68 \log (\% \text{ of (BW)/100})$ dB attenuation.
- (6) On any frequency removed from the assigned frequency above 150% of the authorized bandwidth: 40 dB.
- (7) The zero dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.

8.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C Section 2.2.12.

8.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
 below 1G is defined as ± 3.8 dB

8.6. Test Result

Product	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD		
Test Item	Radiated Spurious Emission		
Date of Test	2012/08/30	Test Site	AC5

Mode1: Transmit (Chain 100)

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 01 (4960MHz)								
9920.0	-65.2	V	-48.79	6.65	11.99	-43.45	-29.0	-19.79
14880.0	-64.9	V	-43.57	8.33	13.07	-38.83	-29.0	-14.57
9920.0	-64.1	H	-46.99	6.65	11.99	-41.65	-29.0	-17.99
14880.0	-64.7	H	-41.89	8.33	13.07	-37.15	-29.0	-12.89
Channel 02 (4980MHz)								
9960.0	-64.5	V	-47.44	6.7	12.04	-42.1	-28.7	-18.74
14940.0	-66.4	V	-44.87	8.34	13.31	-39.9	-28.7	-16.17
9960.0	-64.7	H	-46.74	6.7	12.04	-41.4	-28.7	-18.04
14940.0	-65.1	H	-43.17	8.34	13.31	-38.2	-28.7	-14.47

Mode1: Transmit (Chain 010)

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 01 (4960MHz)								
9920.0	-65.2	V	-48.34	6.65	11.99	-43.0	-28.2	-20.14
14880.0	-66.1	V	-44.14	8.33	13.07	-39.4	-28.2	-15.94
9920.0	-64.8	H	-47.24	6.65	11.99	-41.9	-28.2	-19.04
14880.0	-65.0	H	-41.74	8.33	13.07	-37.0	-28.2	-13.54
Channel 02 (4980MHz)								
9960.0	-64.2	V	-47.14	6.70	12.04	-41.8	-28.5	-18.64
14940.0	-66.5	V	-45.07	8.34	13.31	-40.1	-28.5	-16.57
9960.0	-64.4	H	-46.44	6.70	12.04	-41.1	-28.5	-17.94
14940.0	-66.3	H	-44.37	8.34	13.31	-39.4	-28.5	-15.87

Mode1: Transmit (Chain 110)

Frequency (MHz)	SA Reading (dBm)	Ant.Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
Channel 01 (4960MHz)								
9920.0	-64.9	V	-48.04	6.65	11.99	-42.7	-29.4	-18.64
14880.0	-65.5	V	-43.54	8.33	13.07	-38.8	-29.4	-14.14
9920.0	-64.9	H	-47.34	6.65	11.99	-42.0	-29.4	-17.94
14880.0	-65.7	H	-42.44	8.33	13.07	-37.7	-29.4	-13.04
Channel 02 (4980MHz)								
9960.0	-64.6	V	-47.44	6.70	12.04	-42.1	-29.2	-18.24
14940.0	-66.3	V	-44.87	8.34	13.31	-39.9	-29.2	-15.67
9960.0	-64.5	H	-46.54	6.70	12.04	-41.2	-29.2	-17.34
14940.0	-66.5	H	-44.57	8.34	13.31	-39.6	-29.2	-15.37

9. Peak Excursion

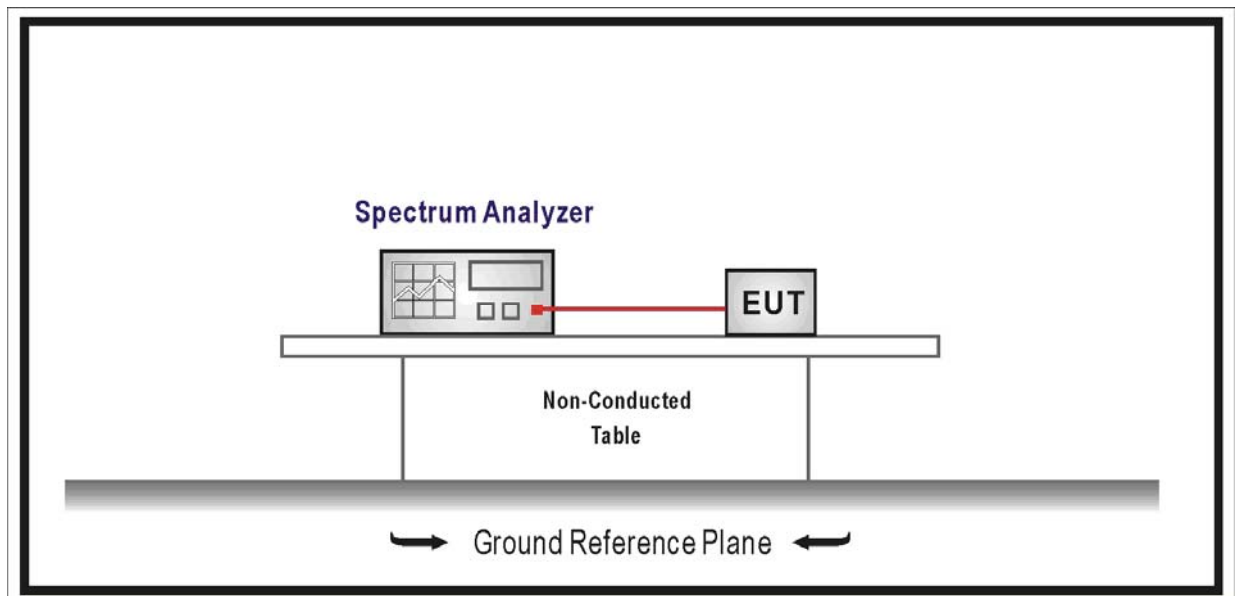
9.1. Test Equipment

Peak Excursion / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

9.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C.

9.5. Uncertainty

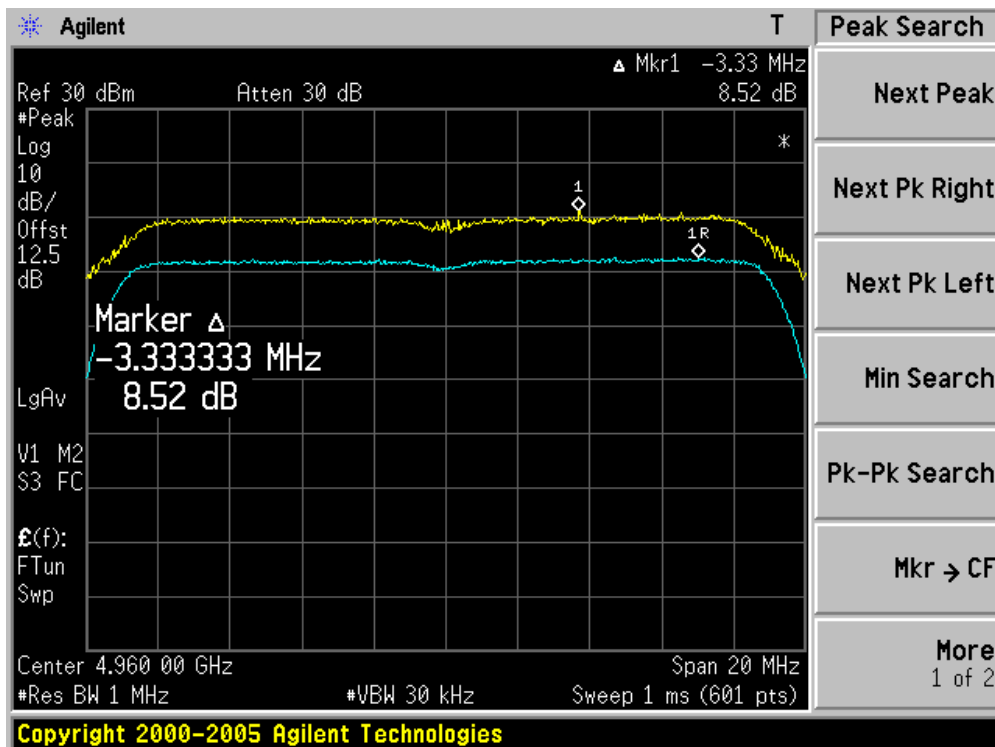
The measurement uncertainty is defined as ± 1.27 dB

9.6. Test Result

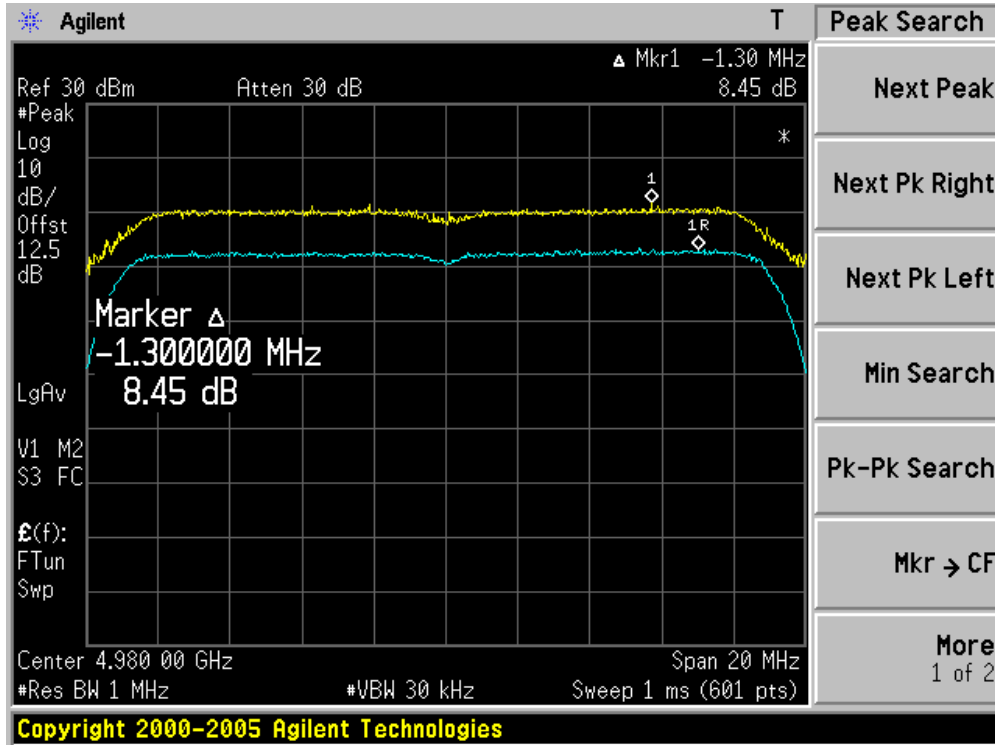
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Peak Excursion
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 100)

Channel No.	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Result
01	4960	8.52	13	Pass
02	4980	8.45	13	Pass

Channel 01 (4960MHz)



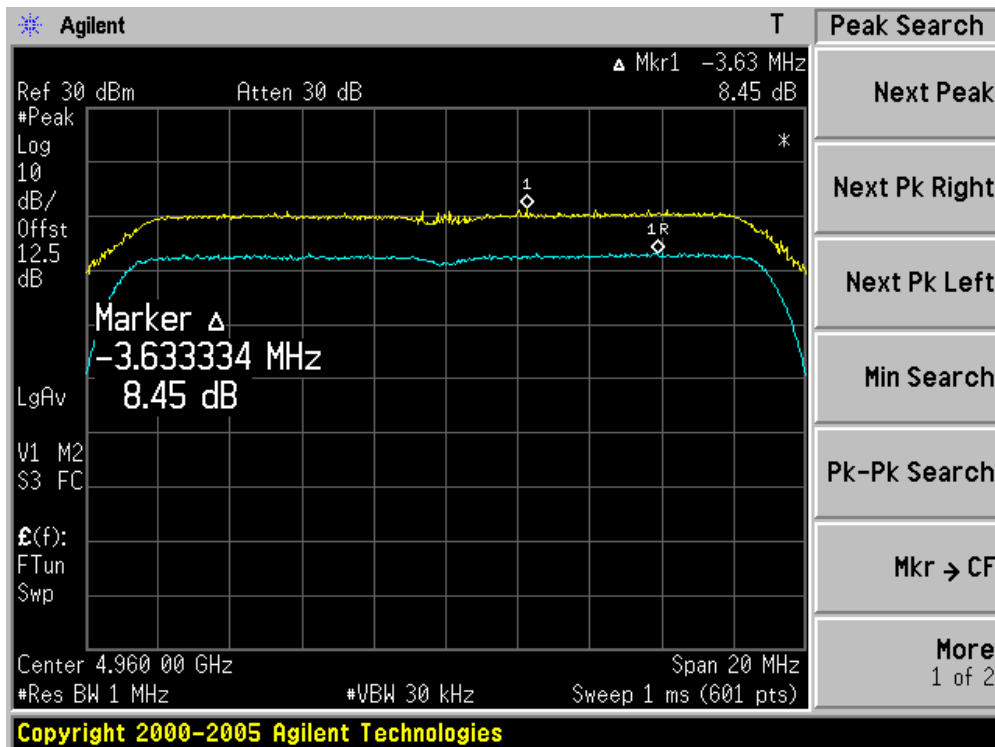
Channel 02 (4980MHz)



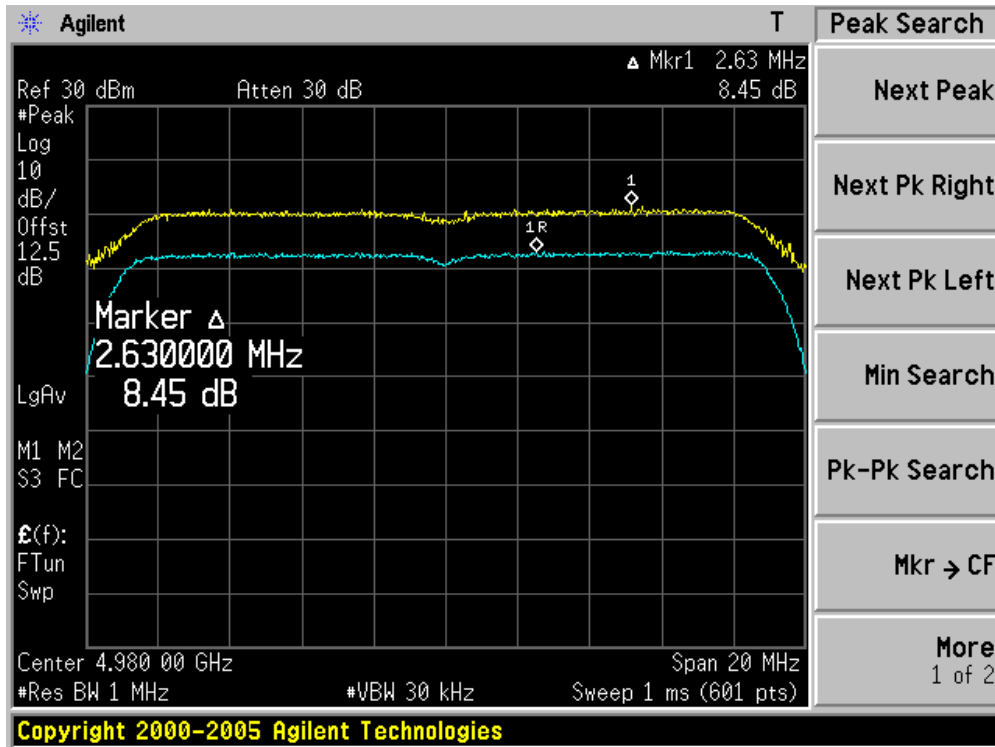
Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Peak Excursion
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit(Chain 010)

Channel No.	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Result
01	4960	8.45	13	Pass
02	4980	8.45	13	Pass

Channel 01 (4960MHz)



Channel 02 (4980MHz)



10. Frequency Stability

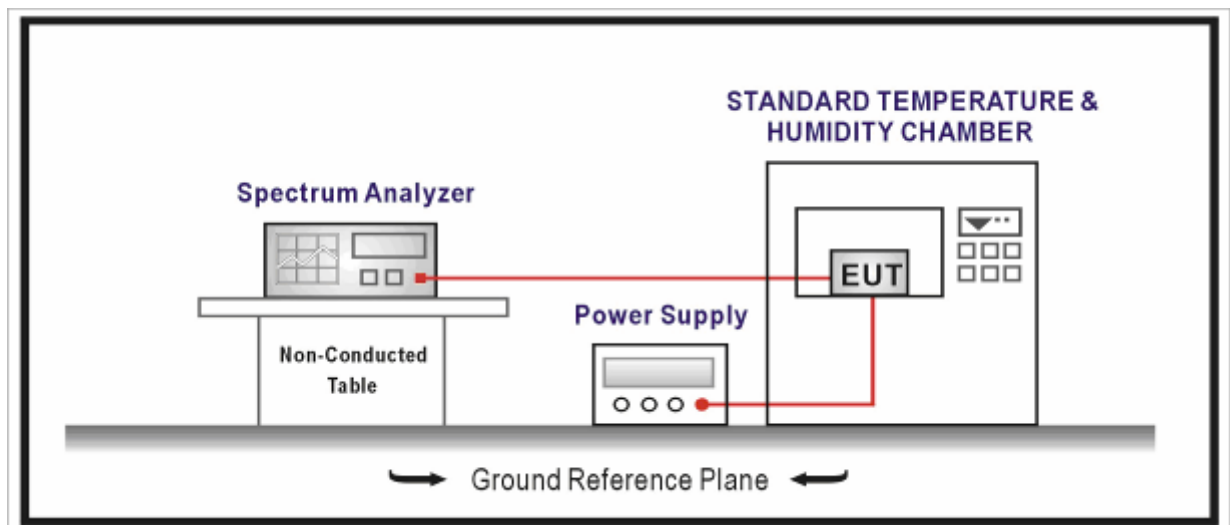
10.1. Test Equipment

Frequency Stability / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2013.04.18
AC Power Supply	IDRC	CF-500TP	979422	2012.09.22
DC Power Supply	IDRC	CD-035-020PR	977272	2012.09.22
Programmable Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2012.01.19
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2013.05.07

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

10.4. Test Procedure

The EUT was tested according to ANSI TIA-603-C Section 2.3.1 and 2.3.2.

10.5. Uncertainty

The measurement uncertainty is defined as ± 100 Hz

10.6. Test Result

Product	:	WIRELESS-A/N 20DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	Frequency Stability
Test Site	:	TR-8
Test Mode	:	Mode1: Transmit(Carrier)

Operating Frequency: 4960MHz					
Temp (°C)	Voltage (AC)	Frequency Tolerance (ppm)			
		0 minutes	2 minutes	5 minutes	10 minutes
-30	2.8	2.55	2.44	2.57	2.54
	3.3	2.22	2.23	2.21	2.21
	3.8	2.41	2.39	2.40	2.33
-20	2.8	2.54	2.43	2.56	2.57
	3.3	2.21	2.24	2.22	2.23
	3.8	2.43	2.42	2.41	2.34
-10	2.8	2.53	2.50	2.49	2.56
	3.3	2.23	2.27	2.21	2.24
	3.8	2.41	2.41	2.39	2.32
0	2.8	2.51	2.54	2.53	2.50
	3.3	2.21	2.24	2.22	2.23
	3.8	2.41	2.40	2.39	2.33
10	2.8	2.52	2.53	2.54	2.52
	3.3	2.23	2.24	2.22	2.22
	3.8	2.42	2.41	2.41	2.32
20	2.8	2.51	2.54	2.56	2.36
	3.3	2.24	2.23	2.21	2.21
	3.8	2.39	2.35	2.33	2.34
30	2.8	2.52	2.54	2.58	2.42
	3.3	2.24	2.23	2.21	2.21
	3.8	2.41	2.35	2.34	2.36
40	2.8	2.50	2.52	2.54	2.42
	3.3	2.25	2.24	2.22	2.23
	3.8	2.43	2.40	2.35	2.38
55	2.8	2.55	2.52	2.53	2.56
	3.3	2.22	2.21	2.21	2.20
	3.8	2.43	2.43	2.41	2.40