



Test Report

Product Name : Wireless Outdoor Bridge

Model No. : ZA-4000

FCC ID : UDKZA4000

Applicant : Nanjing Z-Com Wireless Co.,Ltd

Address : 168 Long Pan Zhong Road, Jiangsu Software Park,
Suite 118 Nanjing, China 210002

Date of Receipt : 2007/04/25

Issued Date : 2007/07/09

Report No. : 075S002-RF-US-P09V01

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 CNLA, NVLAP, NIST or any agency of the Government.

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Test Report Certification

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Product Name : Wireless Outdoor Bridge

Applicant : Nanjing Z-Com Wireless Co.,Ltd

Address : 168 Long Pan Zhong Road, Jiangsu Software Park, Suite
118 Nanjing, China 210002

Manufacturer : Nanjing Z-Com Wireless Co.,Ltd

Model No. : ZA-4000

FCC ID : UDKZA4000

Rated Voltage : AC 120V/60Hz


EUT Voltage : AC 100-240 V / 50-60 Hz


Trade Name : ZDC


Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2007
ANSI C63.4: 2003

Test Result : Complied

Performed Location : SuZhou EMC laboratory
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FCC Registration number: 800392

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Laboratory Information

We , **QuietTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025, EN 45001 and Guide 25:

Taiwan R.O.C.	: BSMI, DGT, CNLA
Germany	: TUV Rheinland
Norway	: Nemko, DNV
USA	: FCC, NVLAP
Japan	: VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from QuietTek Corporation's Web Site : <http://tw.quietek.com/modules/myalbum/>

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

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1. General Information

1.1. EUT Description

Product Name	Wireless Outdoor Bridge
Trade Name	ZDC
Model No.	ZA-4000
FCC ID	UDKZA4000
Working Voltage	100-240VAC 50/60Hz
Frequency Range	802.11a: 5745-5805 MHz
Channel Number	802.11a: 4
Type of Modulation	802.11a: OFDM
Channel Control	Auto
Antenna type	Dipole
Antenna Gain	2dBi

Component	
Adapter	<p>Manufacturer: DVE</p> <p>Model: DSA-0421S-50 1</p> <p>INPUT: 100-240VAC 50/60Hz 1.2A</p> <p>OUTPUT: 48VDC 0.83A</p>
Power supply	Non-shielding, 1.5m, with one ferrite core bonded.

Antenna List

No.	Manufacturer	Model No.	Peak Gain
1	Z-COM	ZA-5102	2dBi

802.11a Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	5745 MHz	02	5765 MHz	03	5785 MHz	04	5805 MHz

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 by 802.11a

Note:

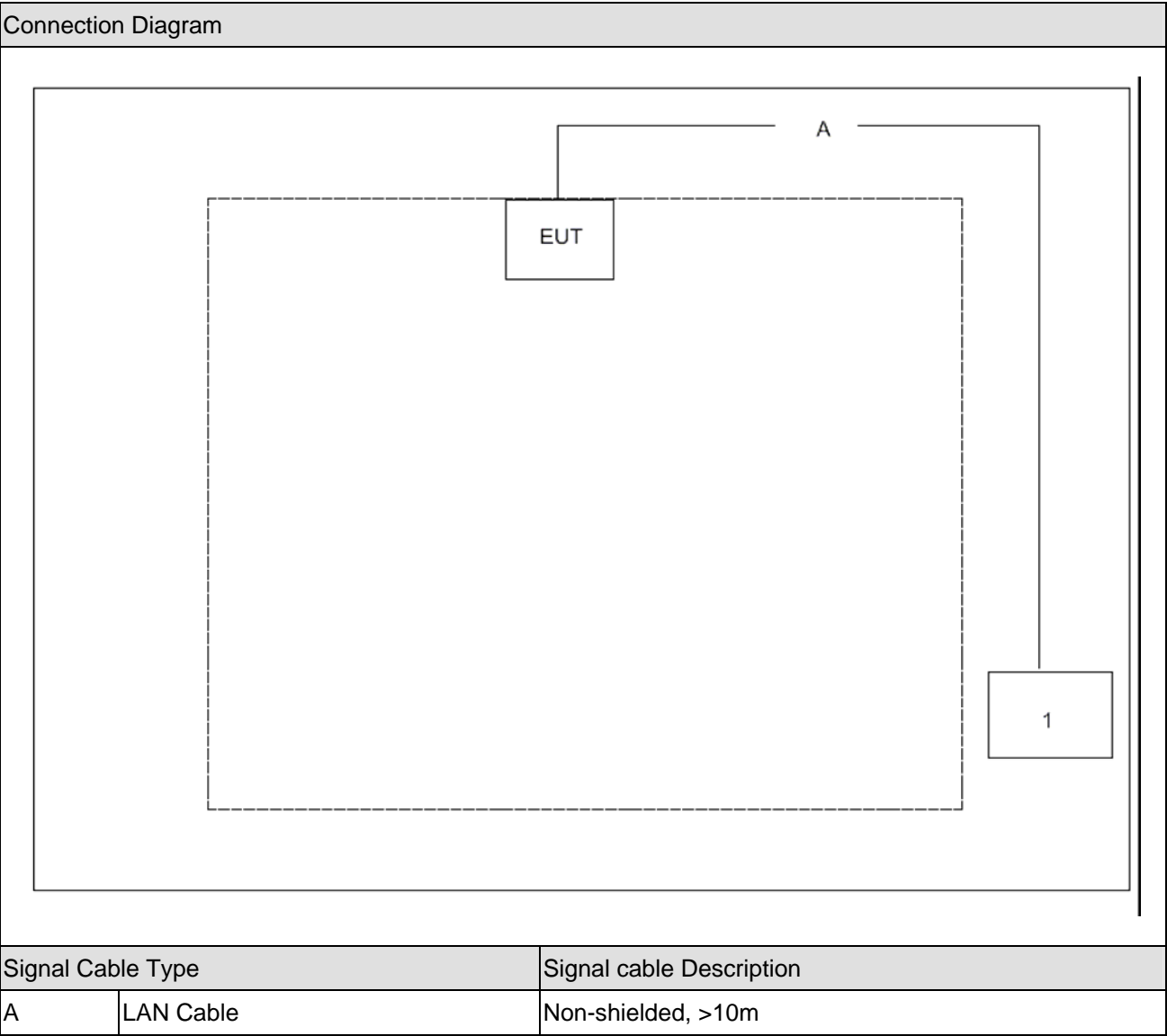
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the receiver was measured and made a test report that the report number is 075S002-RF-US-P01V02-W, certified under Declaration of Conformity.

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	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 all equipment.
3	Use the control software on the Notebook PC to set EUT working at continuous transmission mode, then test.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Emission			
Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.209	Yes	No
26dBc Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.407(a)	Yes	No
Peak Power Output	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.407(a)	Yes	No
Peak Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.407(a)	Yes	No
Peak Excursion	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.407(a)(6)	Yes	No
Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.215(c), 15.407(b)	Yes	No
Frequency Stability	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.407(g)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25
Humidity (%RH)	25-75	48
Barometric pressure (mbar)	860-1060	950-1000

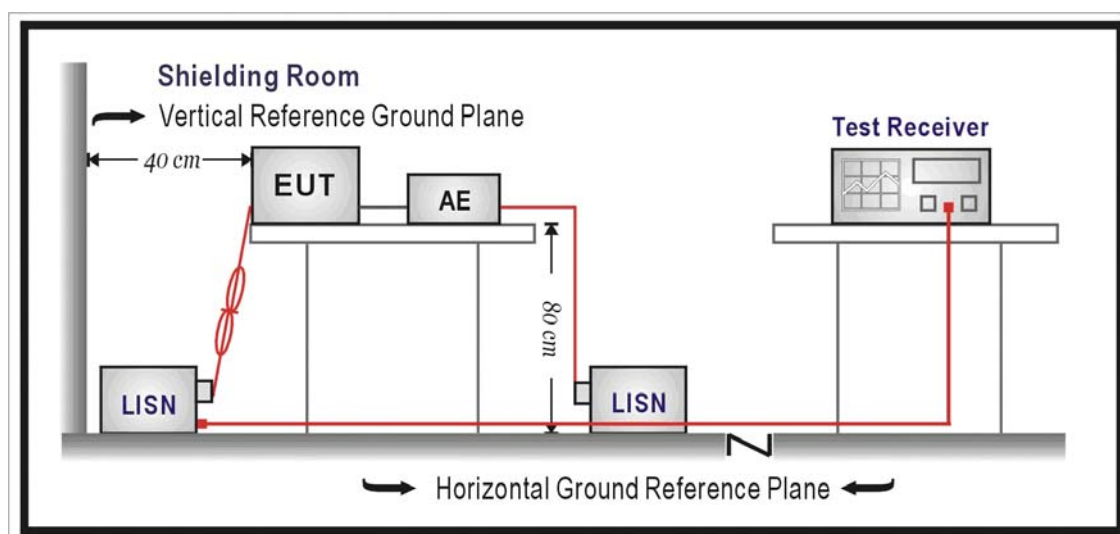
3. Conducted Emission

3.1. Test Equipment

Conducted Emission / SR-1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCI	100176	2006/11/22
Two-Line V-Network	R&S	ENV216	100013	2006/11/20
Two-Line V-Network	R&S	ENV216	100014	2006/11/20
50ohm Coaxial Switch	ANRITSU	MP59B	6200464462	2006/11/25
50ohm Termination	SHX	50ohml	QT-IM001	2007/03/20
Coaxial Cable	Luthi	RG214	519358	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH004	2007/03/31

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

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

3.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

(Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.

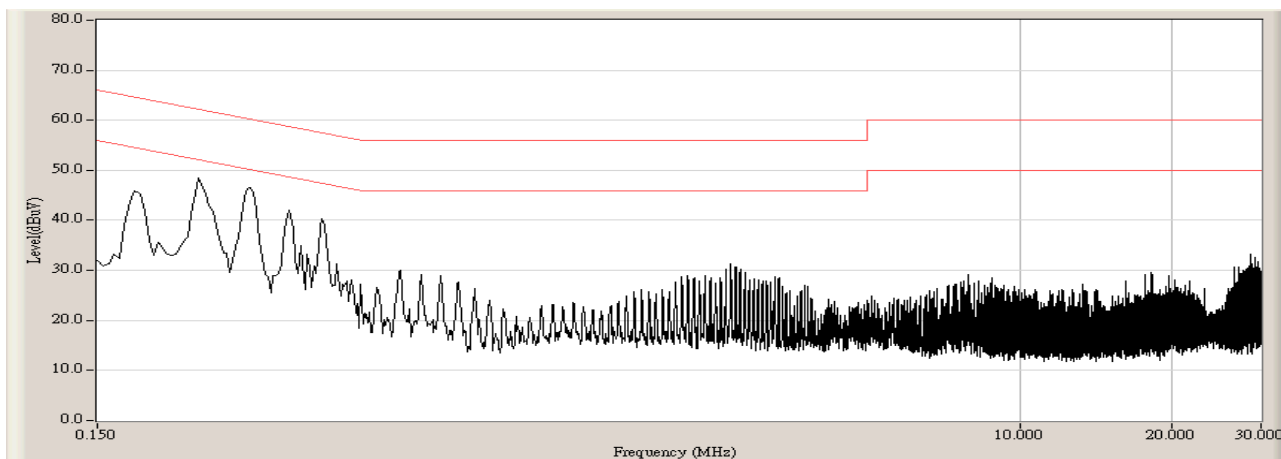
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

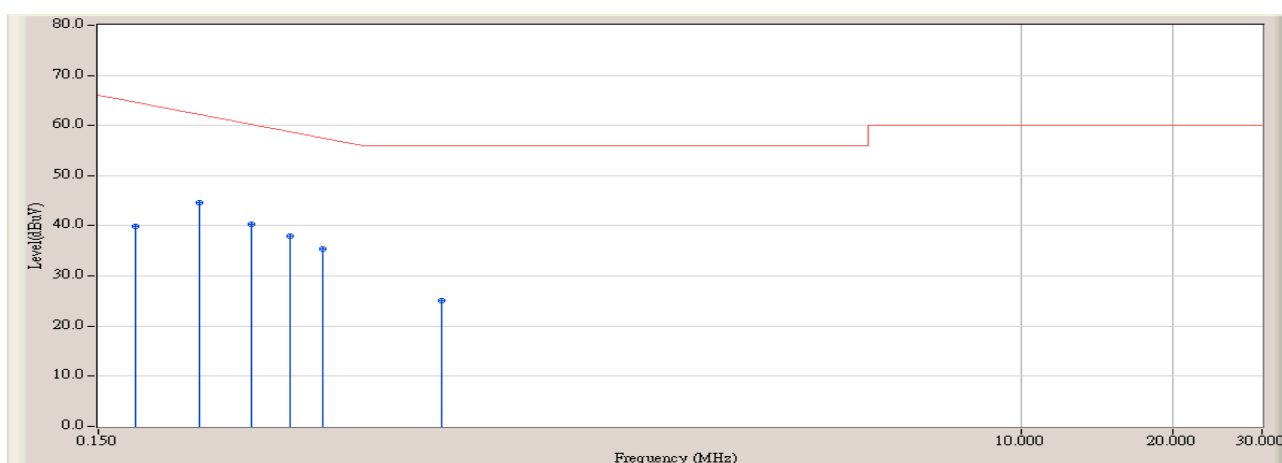
The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:14
Limit : FCC_Spart15.207_00M_QP	Margin : 10
EUT : ZA-4000	Probe : ENV216 - Line1
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)

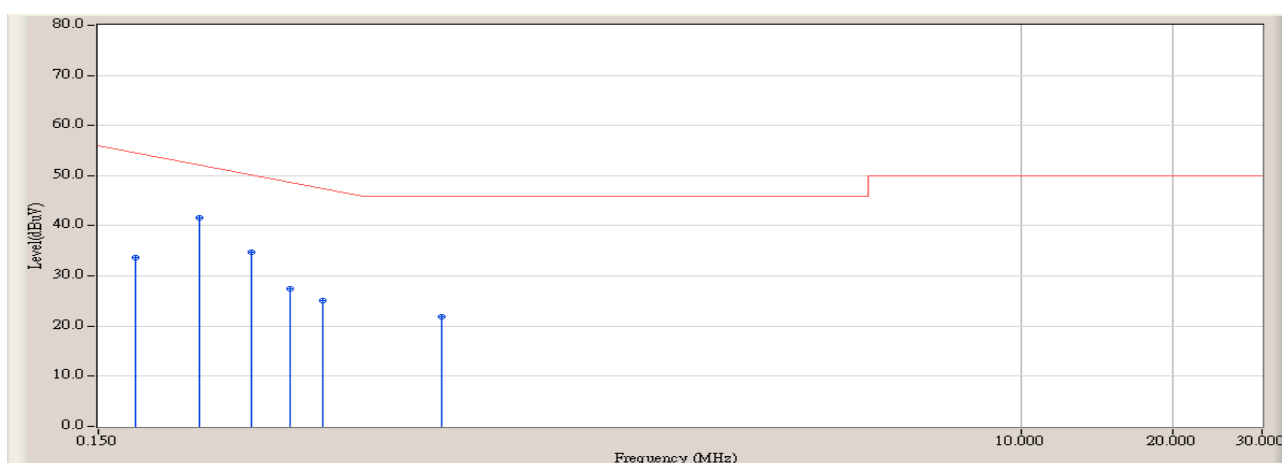


Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:16
Limit : FCC_Spart15.207_00M_QP	Margin : 0
EUT : ZA-4000	Probe : ENV216 - Line1
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



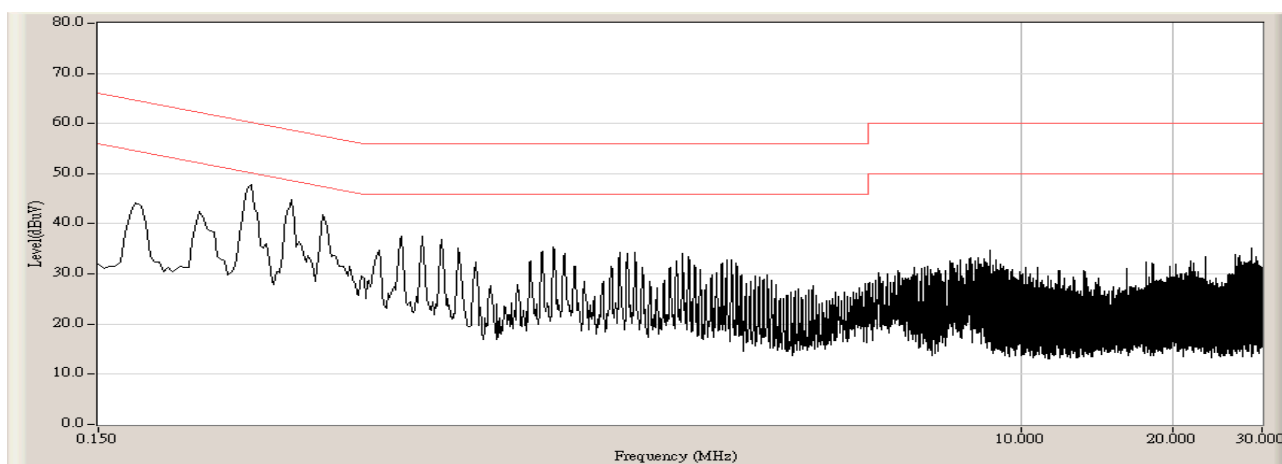
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.178	9.772	30.200	39.972	-25.228	65.200	QUASIPeAK
2	*	0.238	9.325	35.200	44.525	-18.961	63.486	QUASIPeAK
3		0.302	9.403	31.000	40.403	-21.254	61.657	QUASIPeAK
4		0.358	9.469	28.600	38.069	-21.988	60.057	QUASIPeAK
5		0.418	9.529	25.900	35.429	-22.914	58.343	QUASIPeAK
6		0.718	9.694	15.300	24.994	-31.006	56.000	QUASIPeAK

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:16
Limit : FCC_Spart15.207_00M_AV	Margin : 0
EUT : ZA-4000	Probe : ENV216 - Line1
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)

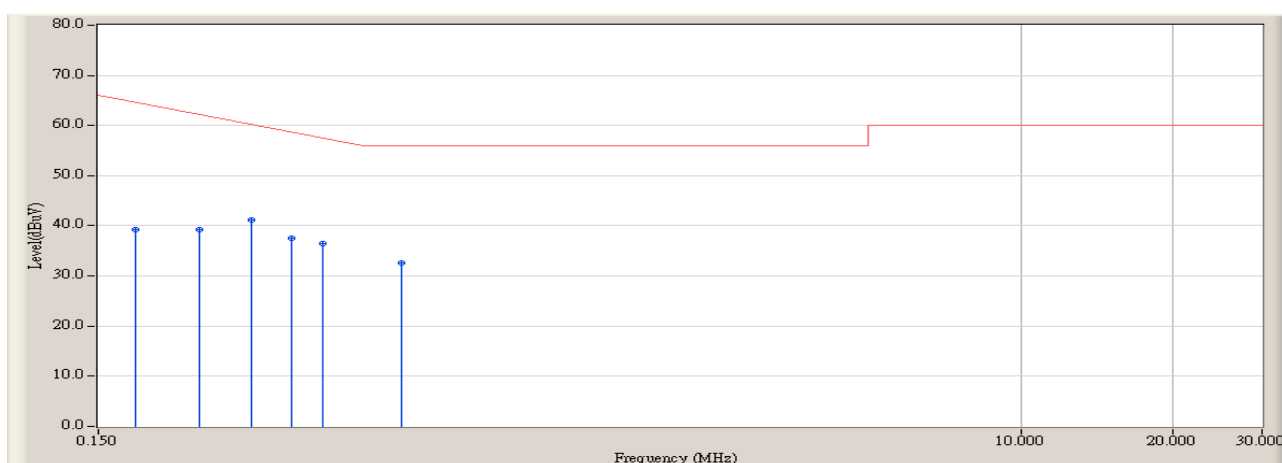


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.178	9.772	23.800	33.572	-21.628	55.200	AVERAGE
2	*	0.238	9.325	32.200	41.525	-11.961	53.486	AVERAGE
3		0.302	9.403	25.300	34.703	-16.954	51.657	AVERAGE
4		0.358	9.469	17.900	27.369	-22.688	50.057	AVERAGE
5		0.418	9.529	15.600	25.129	-23.214	48.343	AVERAGE
6		0.718	9.694	12.100	21.794	-24.206	46.000	AVERAGE

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:24
Limit : FCC_Spart15.207_00M_QP	Margin : 10
EUT : ZA-4000	Probe : ENV216 - Line2
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)

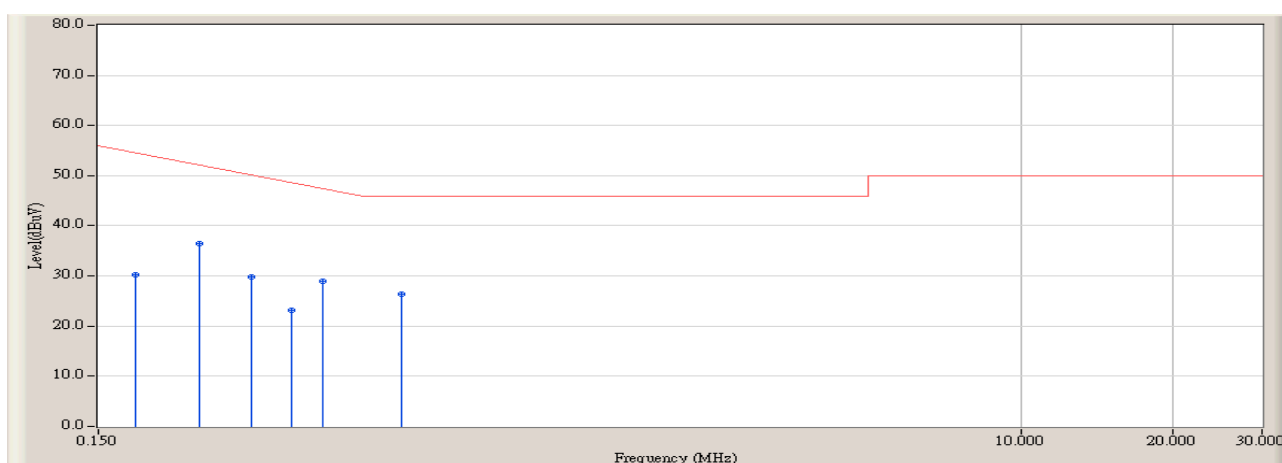


Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:27
Limit : FCC_Spart15.207_00M_QP	Margin : 0
EUT : ZA-4000	Probe : ENV216 - Line2
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.178	9.539	29.800	39.339	-25.861	65.200	QUASIPeAK
2		0.238	9.449	29.900	39.349	-24.137	63.486	QUASIPeAK
3	*	0.302	9.523	31.600	41.123	-20.534	61.657	QUASIPeAK
4		0.362	9.582	27.900	37.482	-22.461	59.943	QUASIPeAK
5		0.418	9.629	26.900	36.529	-21.814	58.343	QUASIPeAK
6		0.598	9.674	22.900	32.574	-23.426	56.000	QUASIPeAK

Engineer : Marlin	
Site : SR-1 (Conducted Emission)	Time : 2007/04/29 - 17:27
Limit : FCC_Spart15.207_00M_AV	Margin : 0
EUT : ZA-4000	Probe : ENV216 - Line2
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.178	9.539	20.800	30.339	-24.861	55.200	AVERAGE
2	*	0.238	9.449	27.100	36.549	-16.937	53.486	AVERAGE
3		0.302	9.523	20.300	29.823	-21.834	51.657	AVERAGE
4		0.362	9.582	13.500	23.082	-26.861	49.943	AVERAGE
5		0.418	9.629	19.400	29.029	-19.314	48.343	AVERAGE
6		0.598	9.674	16.800	26.474	-19.526	46.000	AVERAGE

3.7. Test Photograph

Test Mode: Mode 1: Transmit by 802.11a

Description: Front View of Conduction Test



Test Mode: Mode 1: Transmit by 802.11a

Description: Back View of Conduction Test



4. Radiated Emission

4.1. Test Equipment

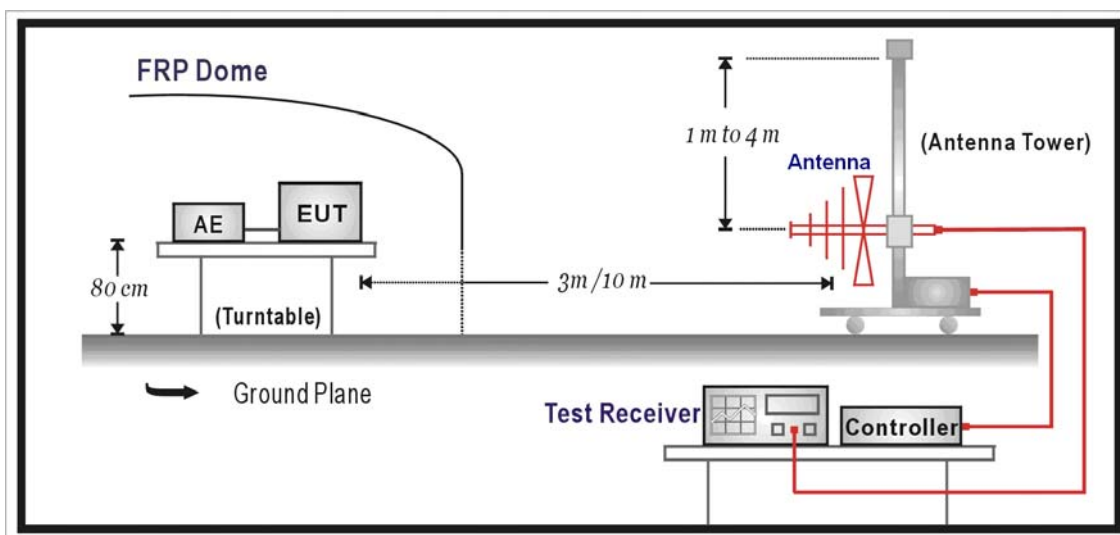
Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4408B	MY45102679	2006/11/20
EMI Test Receiver	R&S	ESCI	100573	2007/05/23
Preamplifier	Quietek	AP-025C	QT-AP003	2006/11/25
Preamplifier	Quietek	AP-180C	CHM-0602013	2006/11/25
Bilog Type Antenna	Schaffner	CBL6112B	2932	2006/11/22
*Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	496	2005/11/25
50ohm Coaxial Switch	ANRITSU	MP59B	6200447304	2006/11/25
Coaxial Cable	Huber+Suhner	AC2-C	04	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH002	2007/03/30

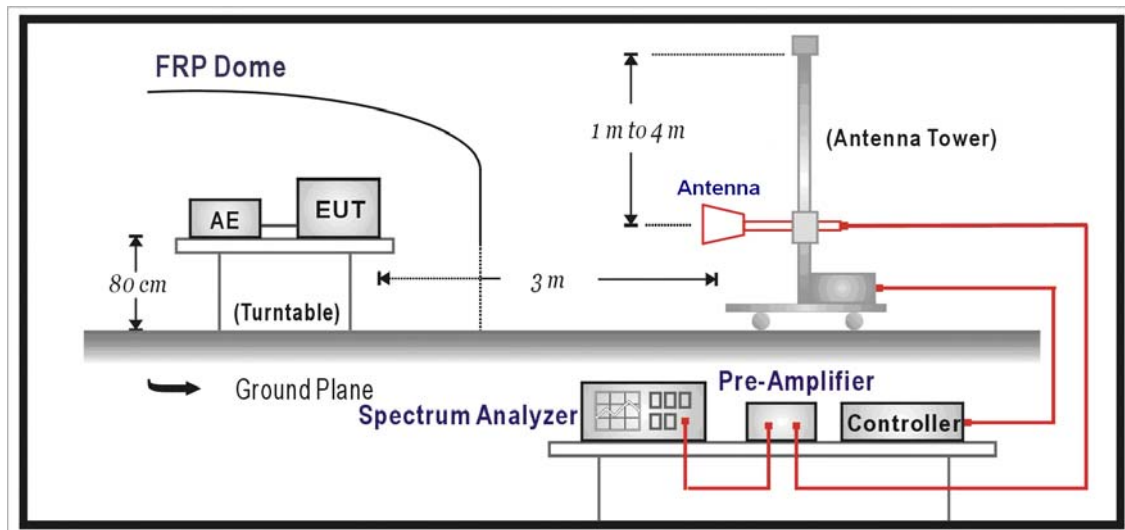
Note: “*” means the test device calibration period for two years.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. $\text{RF Voltage (dBuV/m)} = 20 \log \text{RF Voltage (uV/m)}$

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

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

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCI) is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

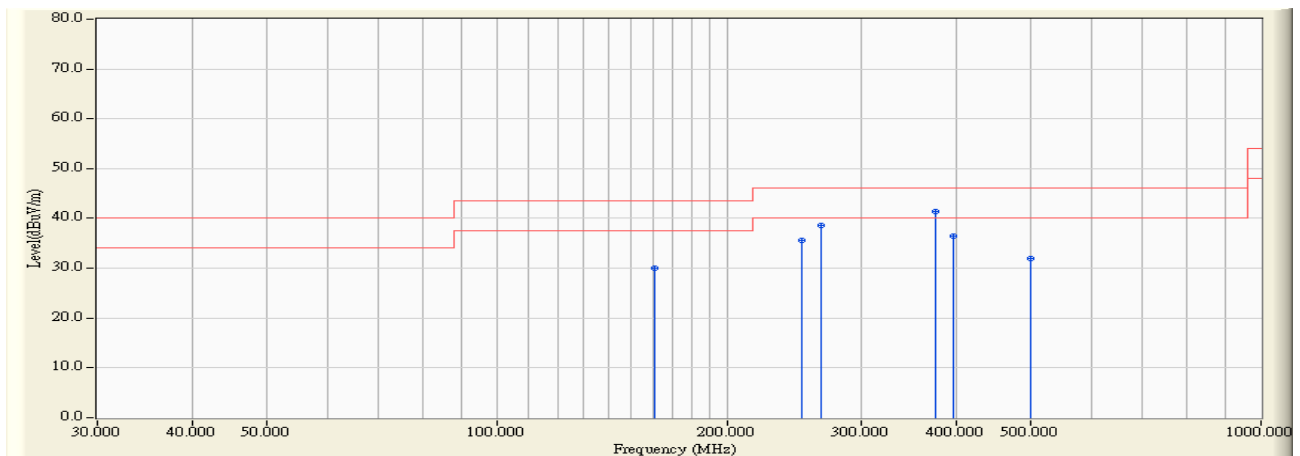
4.5. Uncertainty

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

under 1G is defined as ± 3.8 dB

4.6. Test Result

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 22:57
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-4000	Probe : CBL6112B_2932(30-2000MHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)

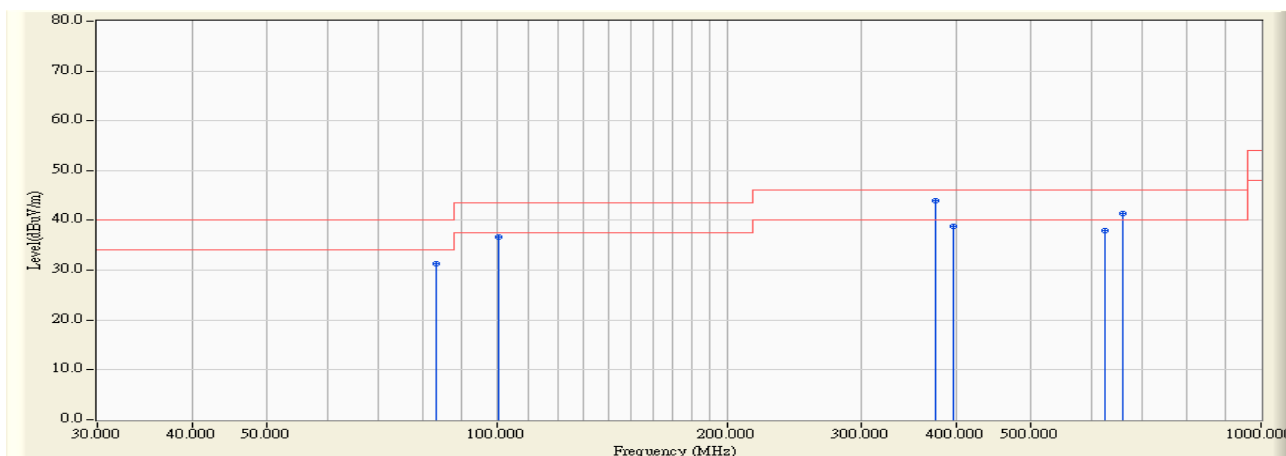


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		160.800	-11.067	41.200	30.134	-13.386	43.520	QUASIPeAK
2		250.600	-8.050	43.600	35.551	-10.469	46.020	QUASIPeAK
3		265.300	-7.163	45.700	38.537	-7.483	46.020	QUASIPeAK
4	*	375.000	-4.332	45.800	41.467	-4.553	46.020	QUASIPeAK
5		396.200	-3.646	40.000	36.354	-9.666	46.020	QUASIPeAK
6		500.450	-1.696	33.700	32.004	-14.016	46.020	QUASIPeAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 22:57
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-4000	Probe : CBL6112B_2932(30-2000MHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)

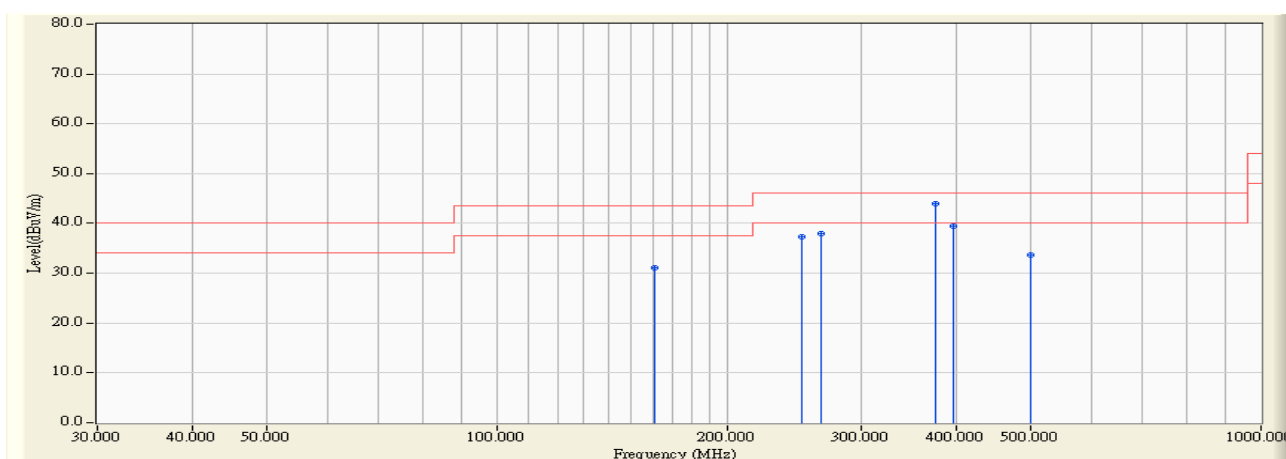


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		83.400	-13.522	44.900	31.379	-8.621	40.000	QUASIPeAK
2		100.400	-10.376	47.000	36.624	-6.896	43.520	QUASIPeAK
3	*	375.000	-4.332	48.300	43.967	-2.053	46.020	QUASIPeAK
4		396.200	-3.646	42.400	38.754	-7.266	46.020	QUASIPeAK
5		624.200	0.302	37.700	38.002	-8.018	46.020	QUASIPeAK
6		660.500	0.371	41.100	41.471	-4.549	46.020	QUASIPeAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 22:58
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-4000	Probe : CBL6112B_2932(30-2000MHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)

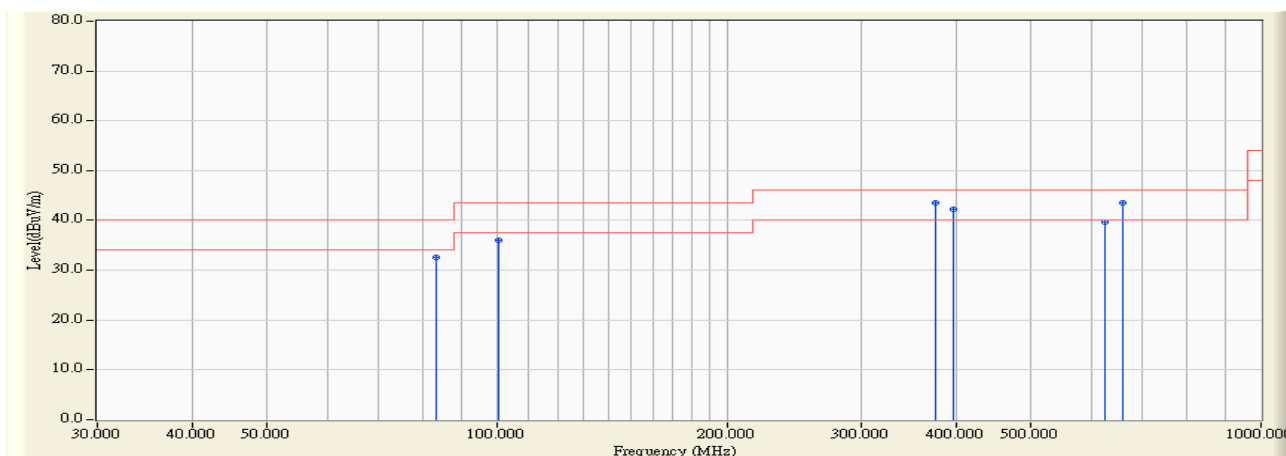


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		160.800	-11.067	42.100	31.034	-12.486	43.520	QUASIPeAK
2		250.600	-8.050	45.400	37.351	-8.669	46.020	QUASIPeAK
3		265.300	-7.163	45.100	37.937	-8.083	46.020	QUASIPeAK
4	*	375.000	-4.332	48.400	44.067	-1.953	46.020	QUASIPeAK
5		396.200	-3.646	43.200	39.554	-6.466	46.020	QUASIPeAK
6		500.450	-1.696	35.300	33.604	-12.416	46.020	QUASIPeAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 22:58
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-4000	Probe : CBL6112B_2932(30-2000MHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)

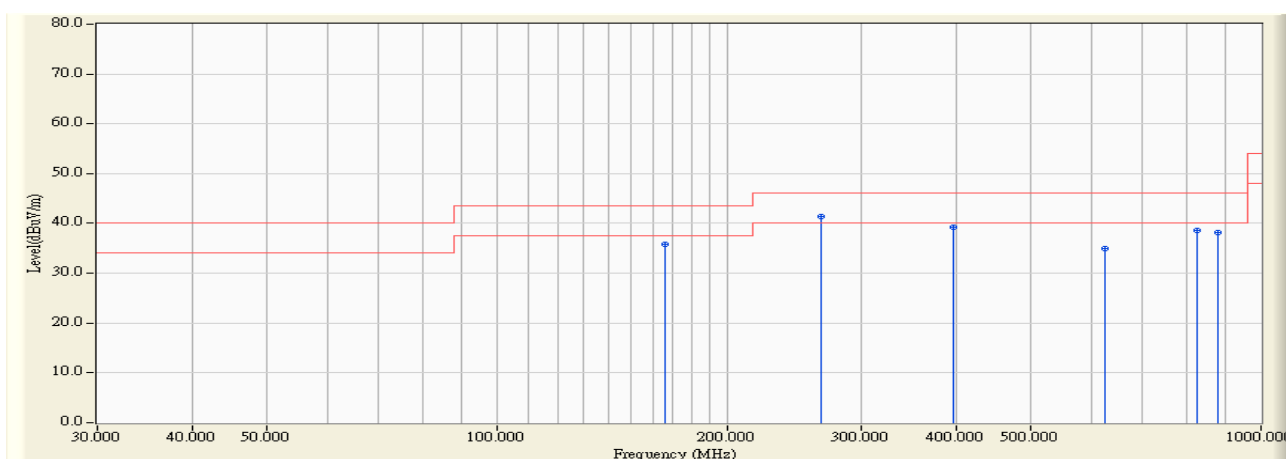


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		83.400	-13.522	46.200	32.679	-7.321	40.000	QUASIPeAK
2		100.400	-10.376	46.500	36.124	-7.396	43.520	QUASIPeAK
3		375.000	-4.332	47.900	43.567	-2.453	46.020	QUASIPeAK
4		396.200	-3.646	45.900	42.254	-3.766	46.020	QUASIPeAK
5		624.200	0.302	39.300	39.602	-6.418	46.020	QUASIPeAK
6	*	660.500	0.371	43.200	43.571	-2.449	46.020	QUASIPeAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 23:00
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-4000	Probe : CBL6112B_2932(30-2000MHz) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)

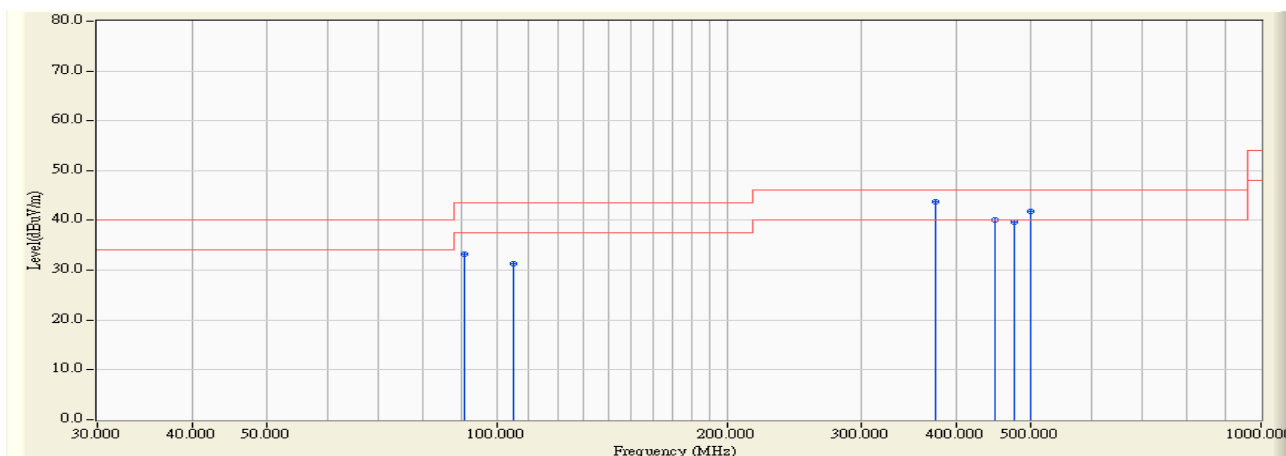


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	165.800	-11.245	46.997	35.752	-7.768	43.520	QUASIPeAK
2	*	265.225	-7.159	48.636	41.477	-4.543	46.020	QUASIPeAK
3		396.175	-3.647	42.909	39.262	-6.758	46.020	QUASIPeAK
4		624.125	0.303	34.631	34.934	-11.086	46.020	QUASIPeAK
5		825.400	2.483	36.222	38.705	-7.315	46.020	QUASIPeAK
6		876.325	2.596	35.489	38.085	-7.935	46.020	QUASIPeAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/30 - 23:01
Limit : FCC_SpartC_15.209_03M_QP	Margin : 6
EUT : ZA-5000	Probe : CBL6112B_2932(30-2000MHz) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)

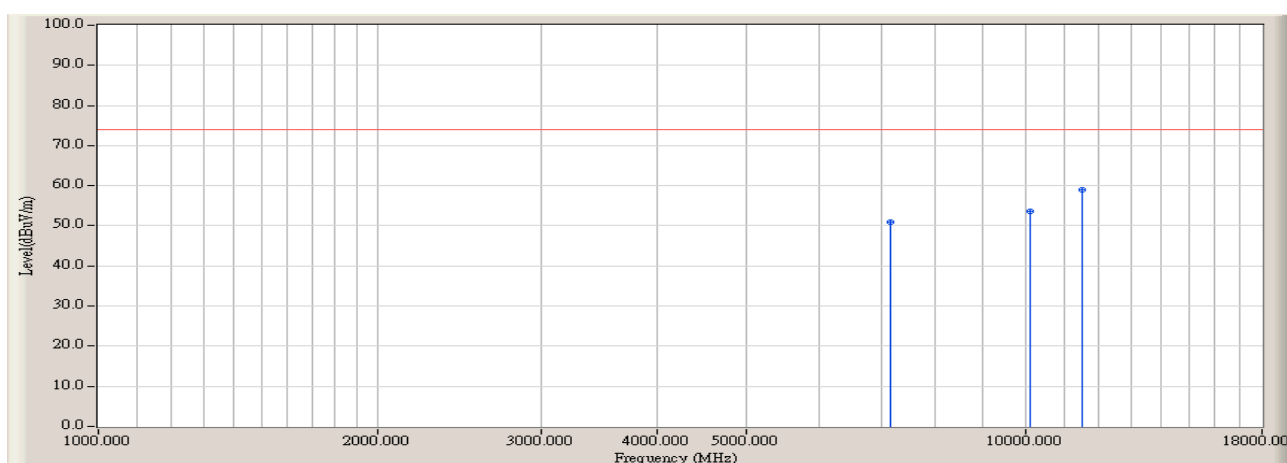


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		90.625	-12.078	45.295	33.217	-10.303	43.520	QUASIPeAK
2		105.175	-9.801	41.097	31.296	-12.224	43.520	QUASIPeAK
3	*	374.350	-4.318	47.979	43.661	-2.359	46.020	QUASIPeAK
4		449.525	-2.806	42.892	40.086	-5.934	46.020	QUASIPeAK
5		476.200	-1.950	41.570	39.620	-6.400	46.020	QUASIPeAK
6		500.450	-1.696	43.578	41.882	-4.138	46.020	QUASIPeAK

Note:

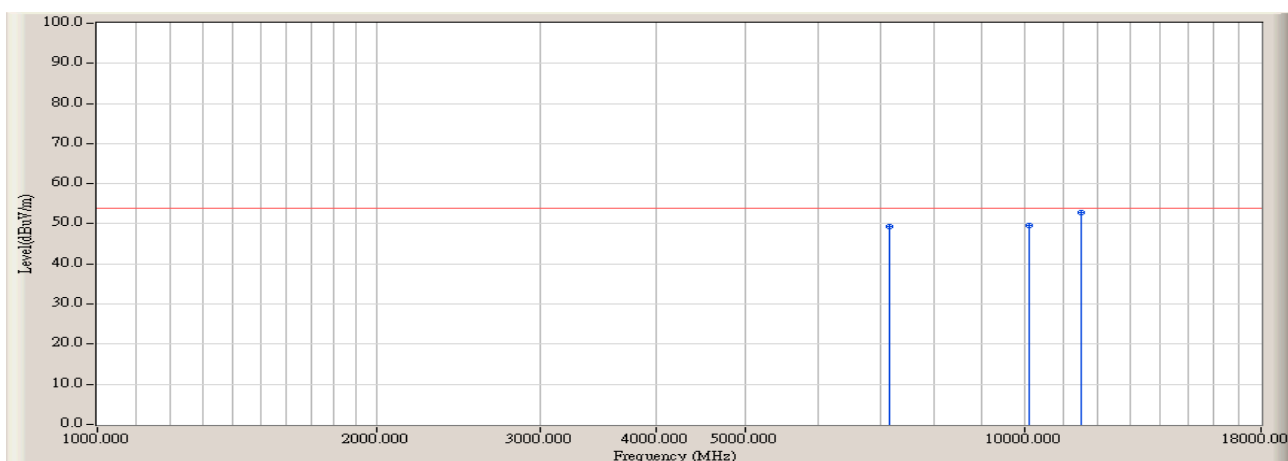
1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:28
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)



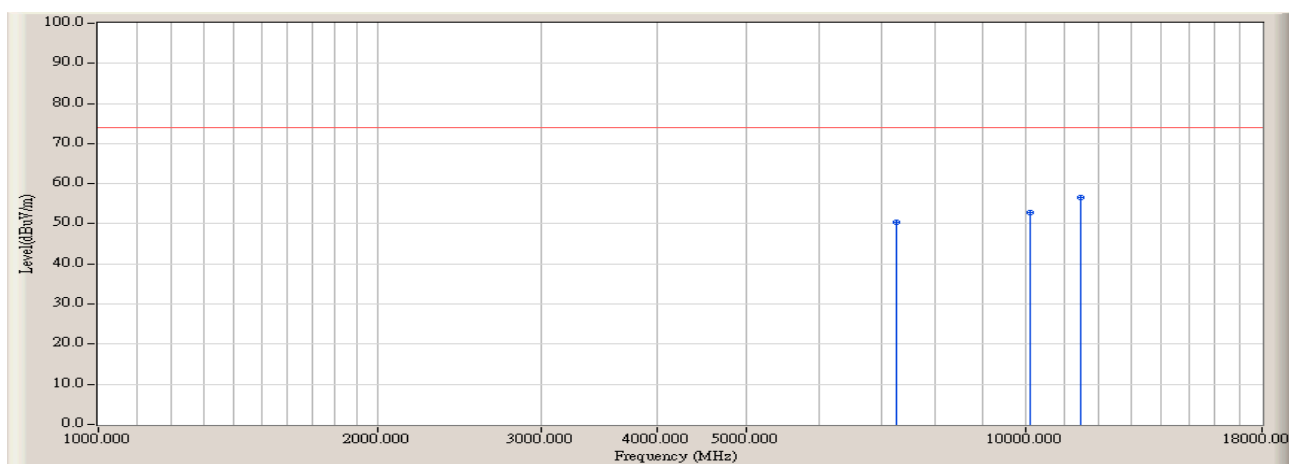
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	35.631	50.868	-23.102	73.970	PEAK
2		10123.333	18.363	35.316	53.679	-20.291	73.970	PEAK
3	*	11511.667	19.507	39.488	58.995	-14.975	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:28
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)



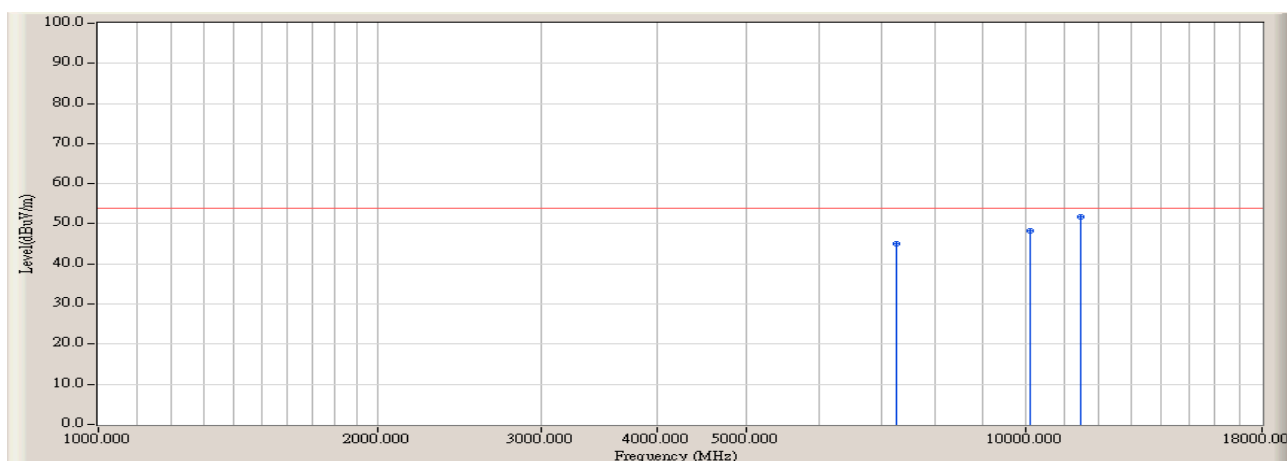
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	34.200	49.437	-4.533	53.970	AVERAGE
2		10123.333	18.363	31.200	49.563	-4.407	53.970	AVERAGE
3	*	11511.667	19.507	33.200	52.707	-1.263	53.970	AVERAGE

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:32
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)



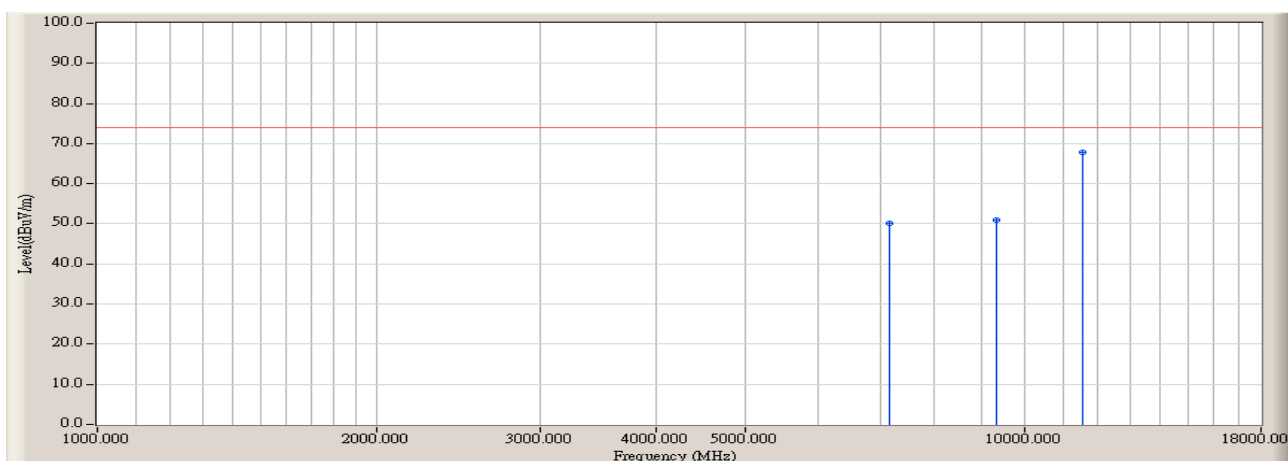
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7261.667	15.374	34.942	50.315	-23.655	73.970	PEAK
2		10123.333	18.363	34.419	52.782	-21.188	73.970	PEAK
3	*	11483.333	19.560	36.949	56.509	-17.461	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:32
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5745MHz)



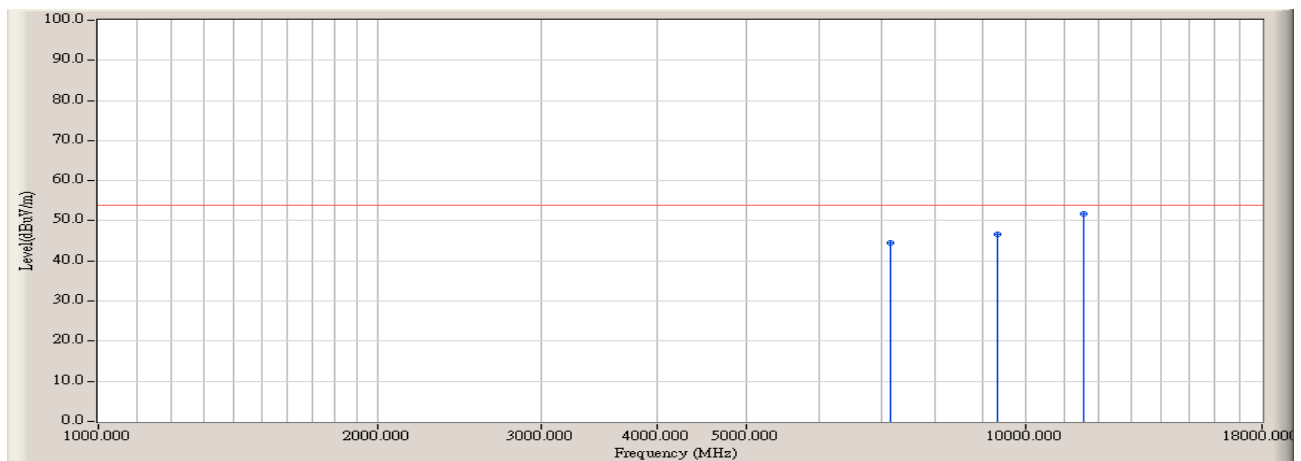
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7261.667	15.374	29.800	45.173	-8.797	53.970	AVERAGE
2		10123.333	18.363	29.800	48.163	-5.807	53.970	AVERAGE
3	*	11483.333	19.560	32.200	51.760	-2.210	53.970	AVERAGE

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:36
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



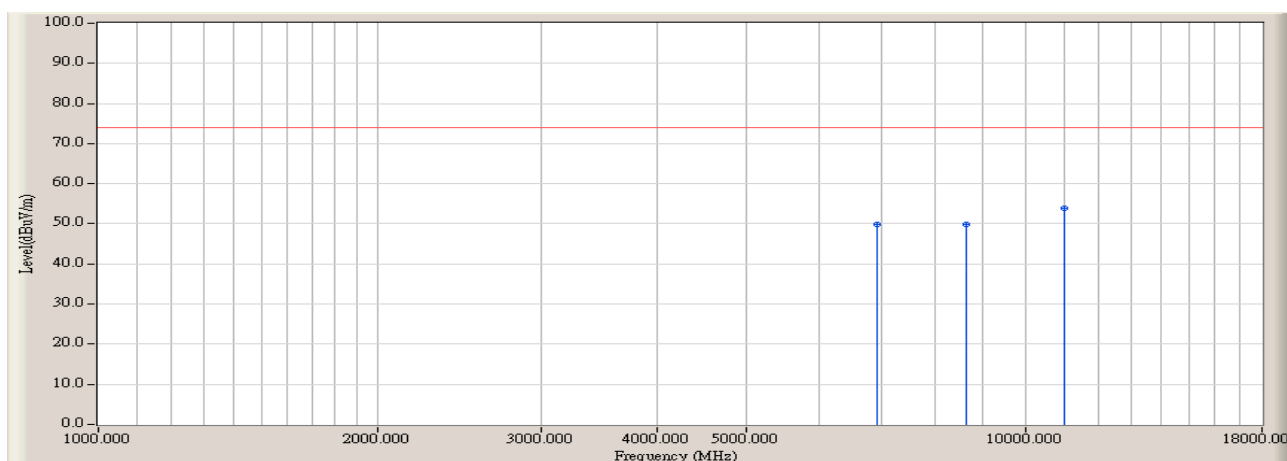
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	35.006	50.243	-23.727	73.970	PEAK
2		9330.000	16.570	34.320	50.890	-23.080	73.970	PEAK
3	*	11568.333	19.431	48.389	67.819	-6.151	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:36
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



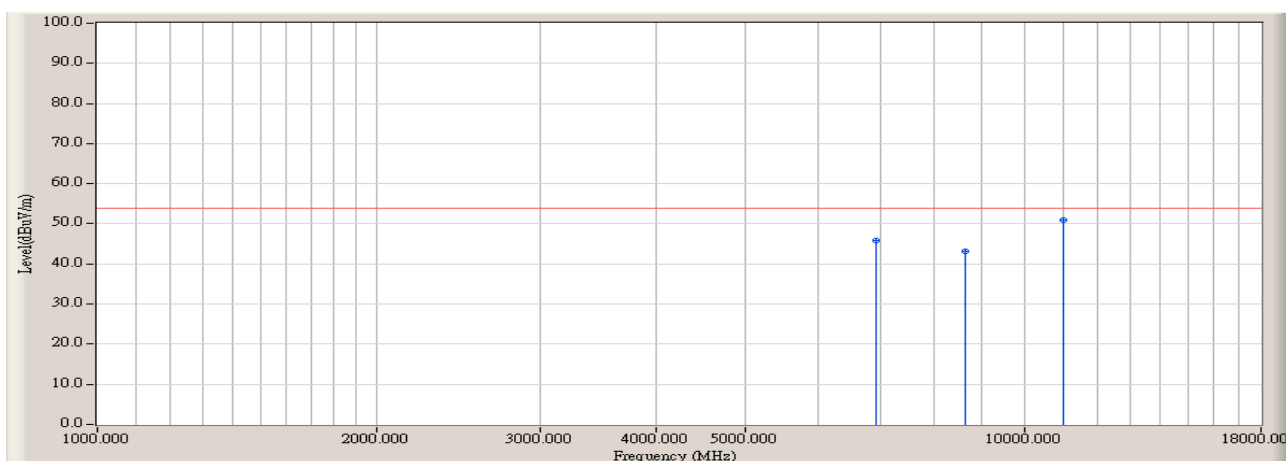
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	29.400	44.637	-9.333	53.970	AVERAGE
2		9330.000	16.570	30.100	46.670	-7.300	53.970	AVERAGE
3	*	11568.333	19.431	32.300	51.730	-2.240	53.970	AVERAGE

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:42
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



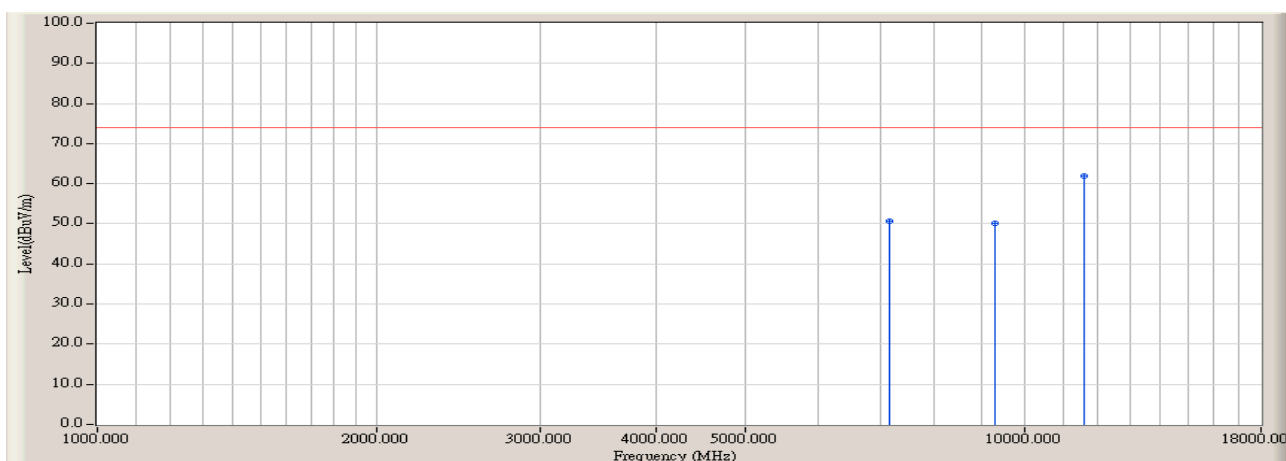
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		6921.667	14.417	35.397	49.814	-24.156	73.970	PEAK
2		8650.000	15.140	34.709	49.849	-24.121	73.970	PEAK
3	*	11030.000	20.200	33.585	53.785	-20.185	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:42
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5785MHz)



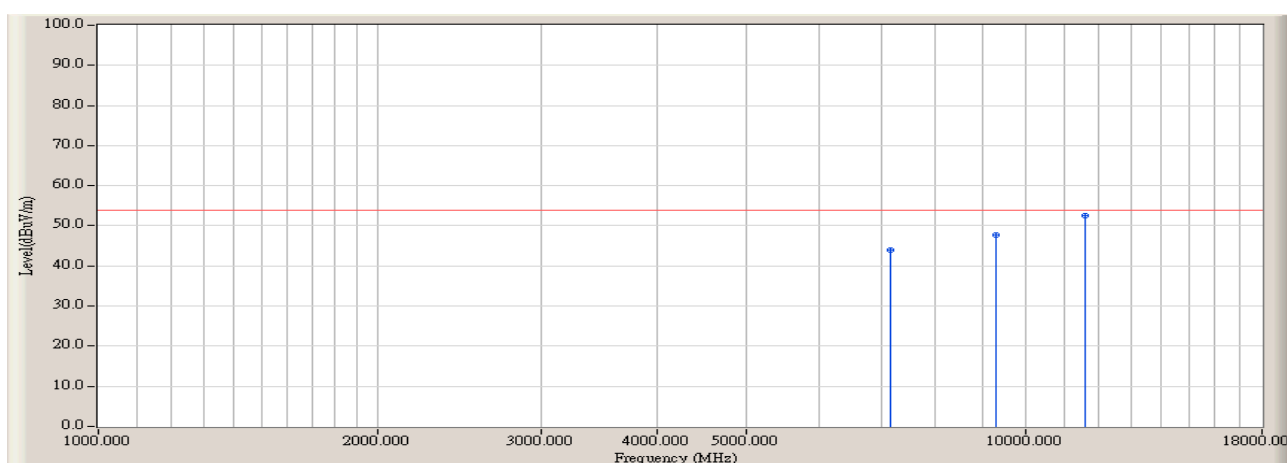
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		6921.667	14.417	31.400	45.817	-8.153	53.970	AVERAGE
2		8650.000	15.140	27.900	43.040	-10.930	53.970	AVERAGE
3	*	11030.000	20.200	30.700	50.900	-3.070	53.970	AVERAGE

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:45
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)



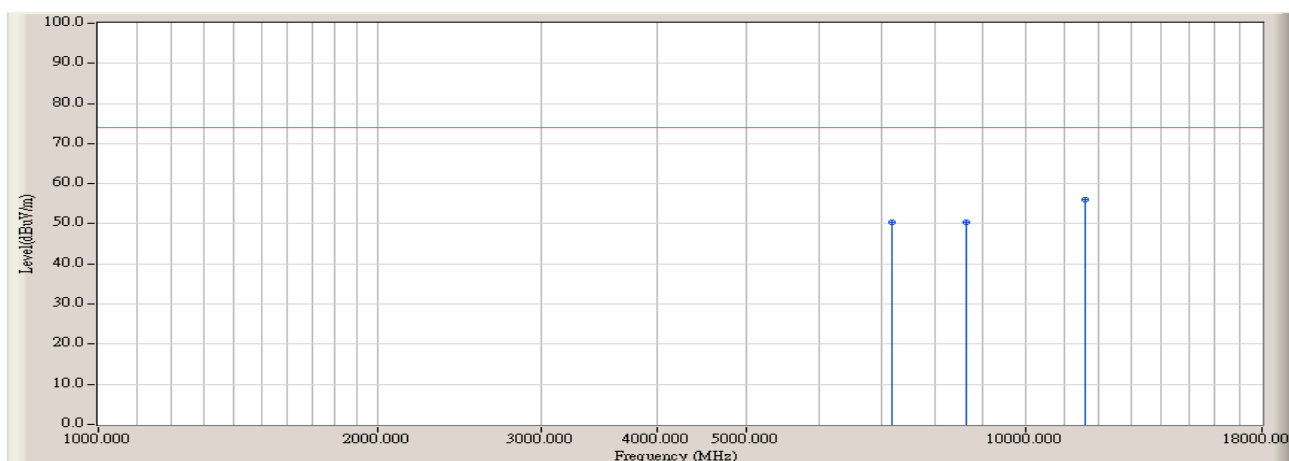
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	35.473	50.710	-23.260	73.970	PEAK
2		9301.667	16.513	33.704	50.217	-23.753	73.970	PEAK
3	*	11596.667	19.393	42.597	61.990	-11.980	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:45
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - HORIZONTAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)



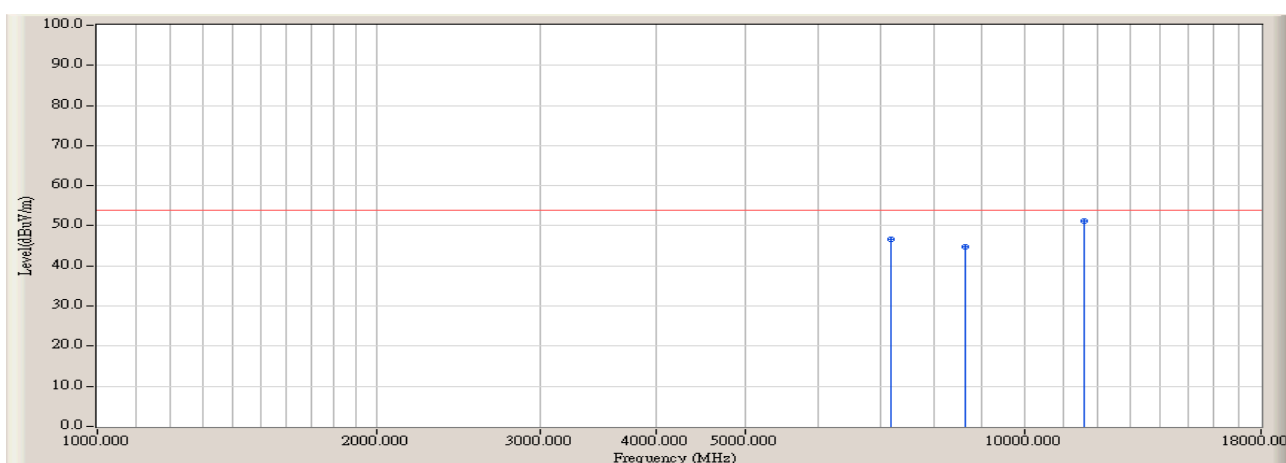
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7148.333	15.236	28.700	43.937	-10.033	53.970	AVERAGE
2		9301.667	16.513	31.200	47.713	-6.257	53.970	AVERAGE
3	*	11596.667	19.393	33.100	52.493	-1.477	53.970	AVERAGE

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:48
Limit : FCC_SpartC_15.209_03M_PK	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)



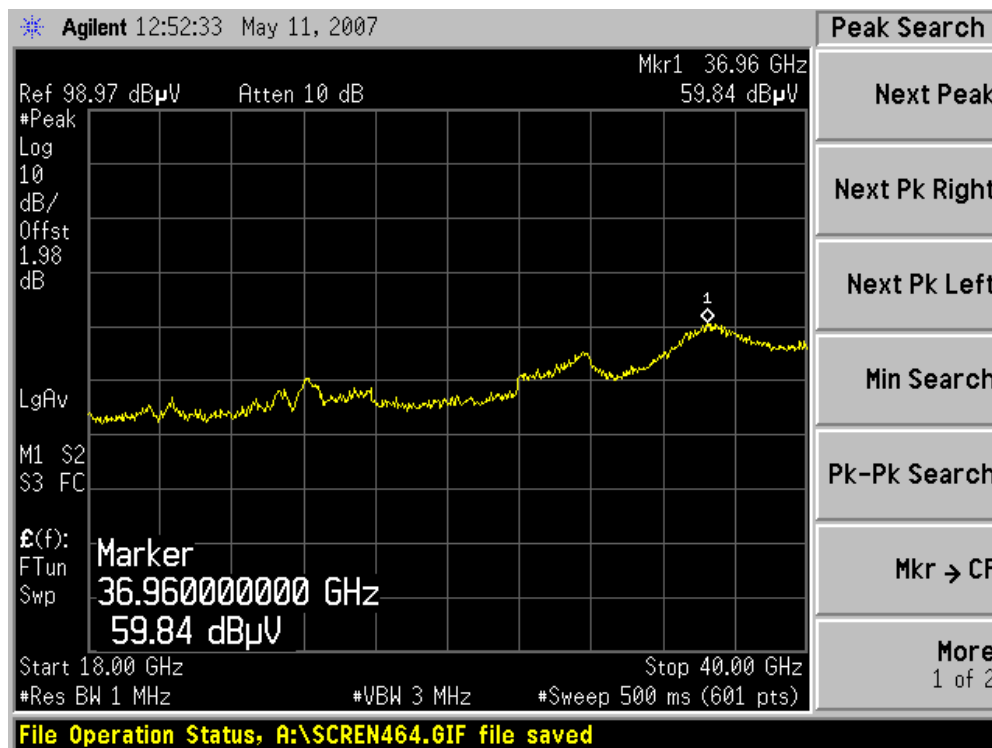
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7176.667	15.347	35.025	50.372	-23.598	73.970	PEAK
2		8621.667	15.057	35.277	50.334	-23.636	73.970	PEAK
3	*	11596.667	19.393	36.734	56.127	-17.843	73.970	PEAK

Engineer : Marlin	
Site : AC-2 (Radiated Emission)	Time : 2007/06/29 - 15:48
Limit : FCC_SpartC_15.209_03M_AV	Margin : 0
EUT : Wireless Outdoor Bridge (ZA-4000)	Probe : 9120D_(1G-18G) - VERTICAL
Power : AC 120V/60Hz	Note : Mode 1: Transmit by 802.11a (5805MHz)

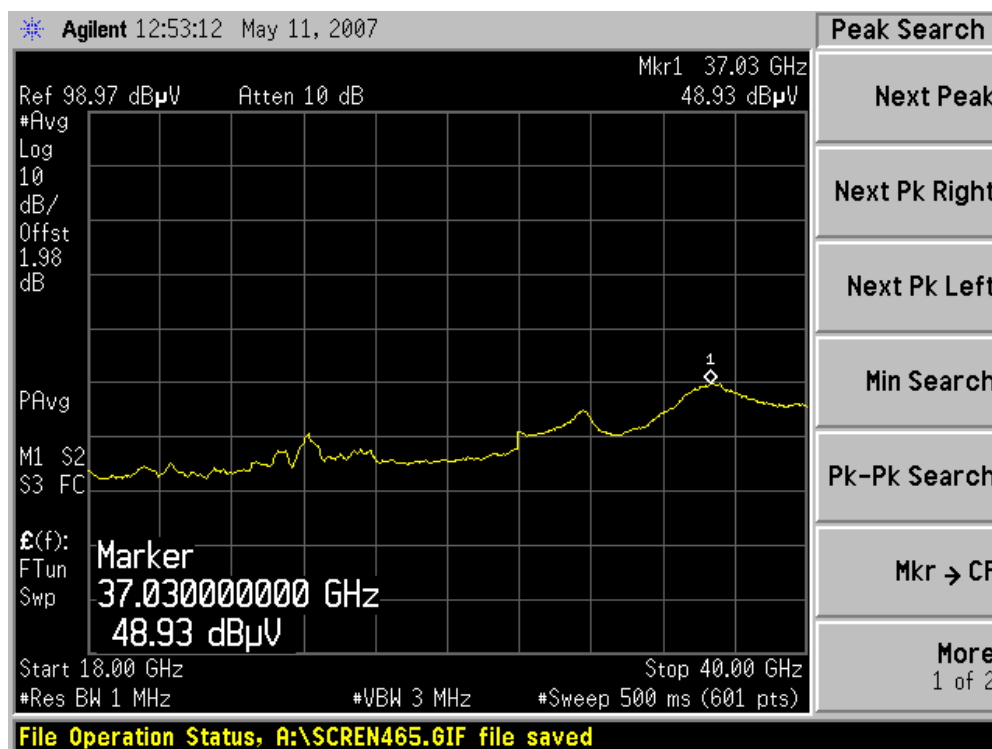


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		7176.667	15.347	31.400	46.747	-7.223	53.970	AVERAGE
2		8621.667	15.057	29.800	44.857	-9.113	53.970	AVERAGE
3	*	11596.667	19.393	31.800	51.193	-2.777	53.970	AVERAGE

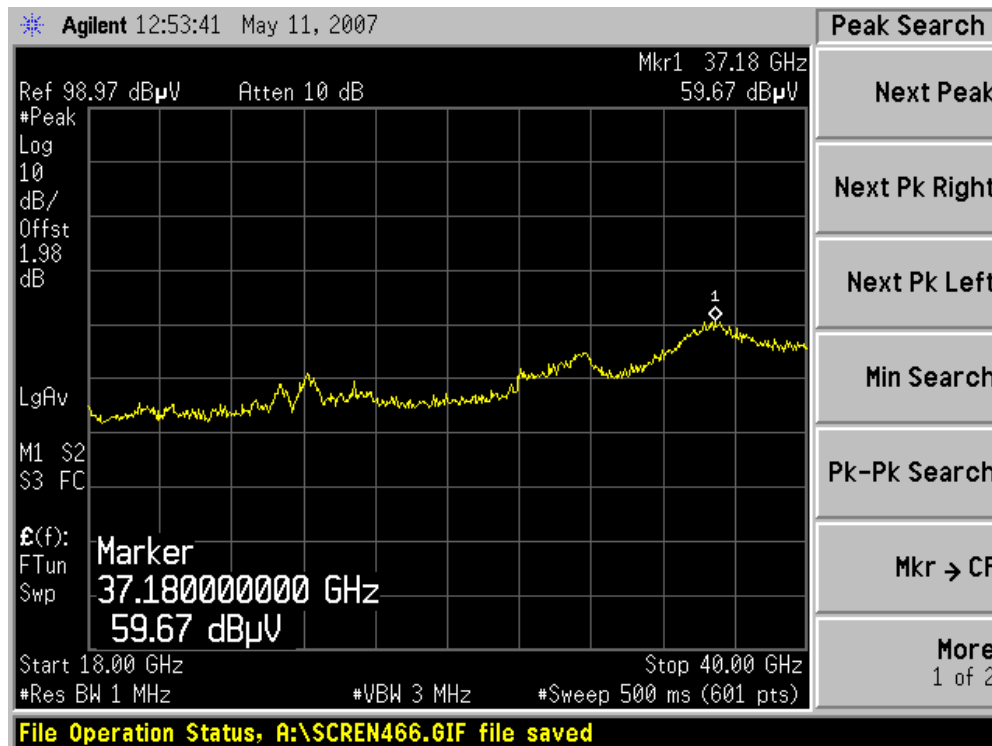
Conducted Spurious - Channel 01 (5745MHz) - 802.11a (Peak)



Conducted Spurious - Channel 01 (5745MHz) - 802.11a (Average)



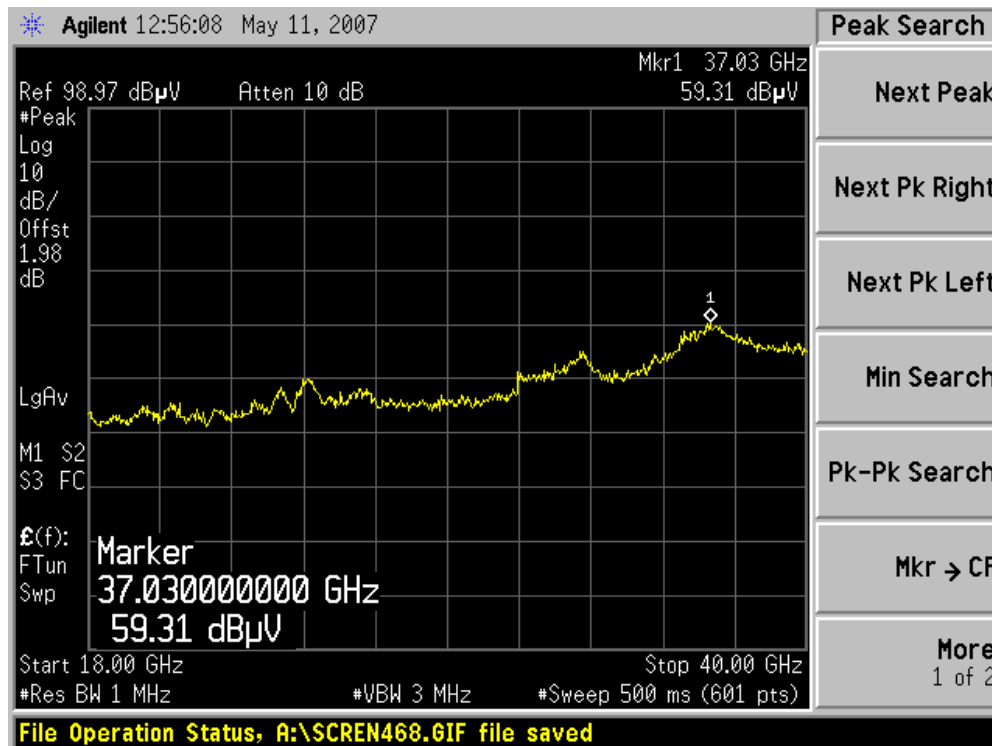
Conducted Spurious - Channel 03 (5785MHz) - 802.11a (Peak)



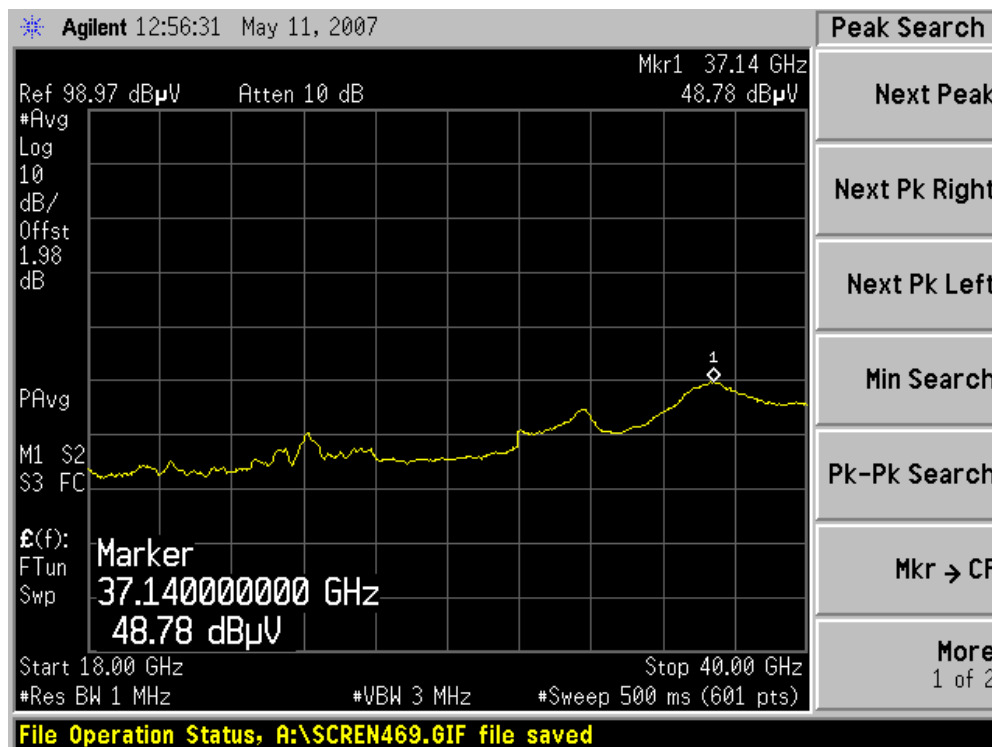
Conducted Spurious - Channel 03 (5785MHz) - 802.11a (Average)



Conducted Spurious - Channel 04 (5805MHz) - 802.11a (Peak)



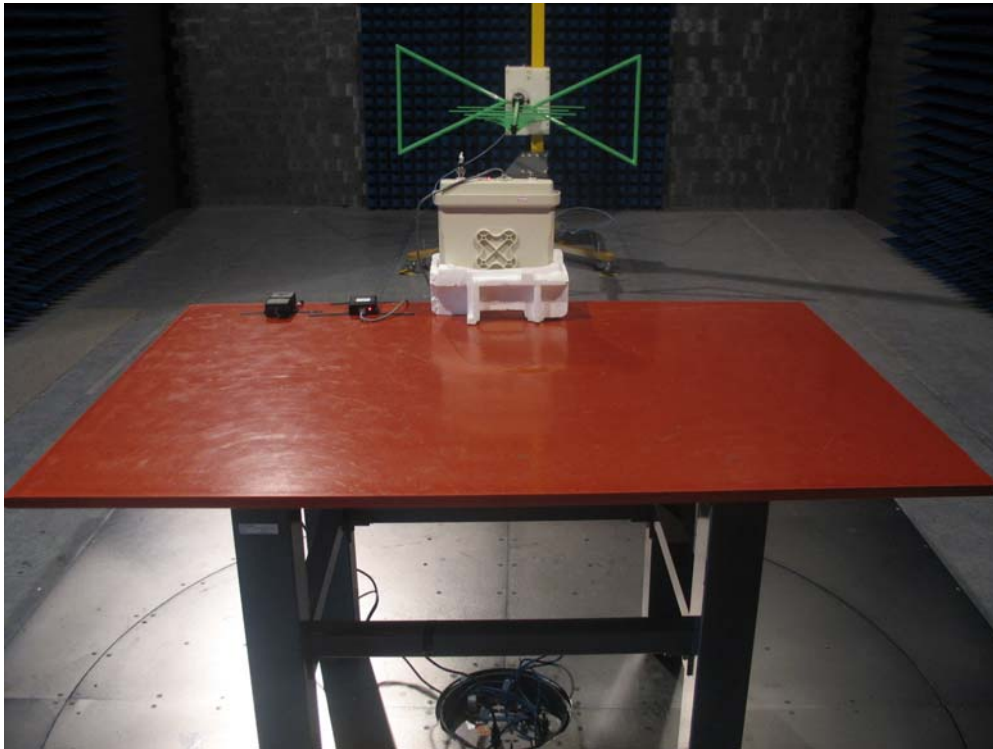
Conducted Spurious - Channel 04 (5805MHz) - 802.11a (Average)



4.7. Test Photograph

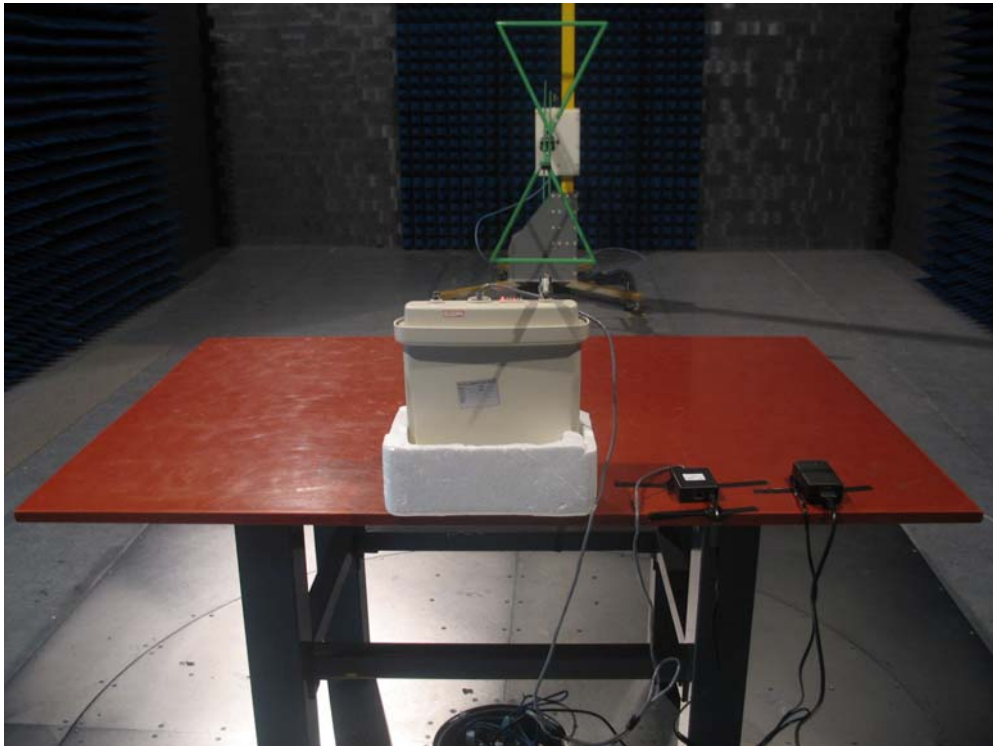
Test Mode: Mode 1: Transmit by 802.11a

Description: Front View of Radiated Test for Under 1GHz



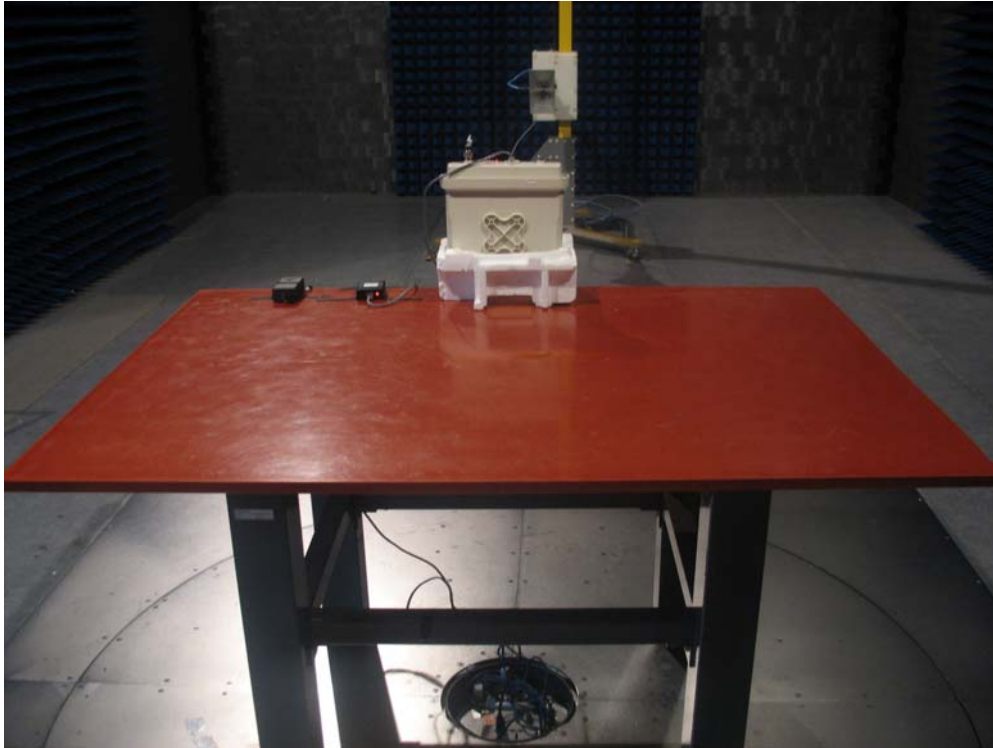
Test Mode: Mode 1: Transmit by 802.11a

Description: Back View of Radiated Test for Under 1GHz



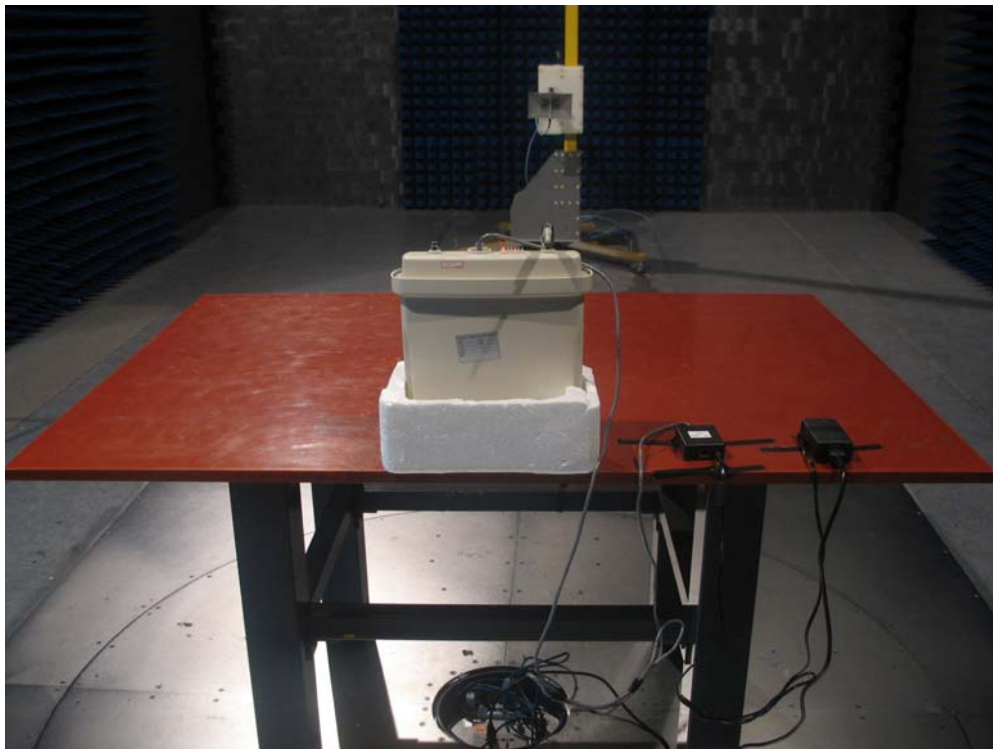
Test Mode: Mode 1: Transmit by 802.11a

Description: Front View of Radiated Test for Above 1GHz



Test Mode: Mode 1: Transmit by 802.11a

Description: Back View of Radiated Test for Above 1GHz



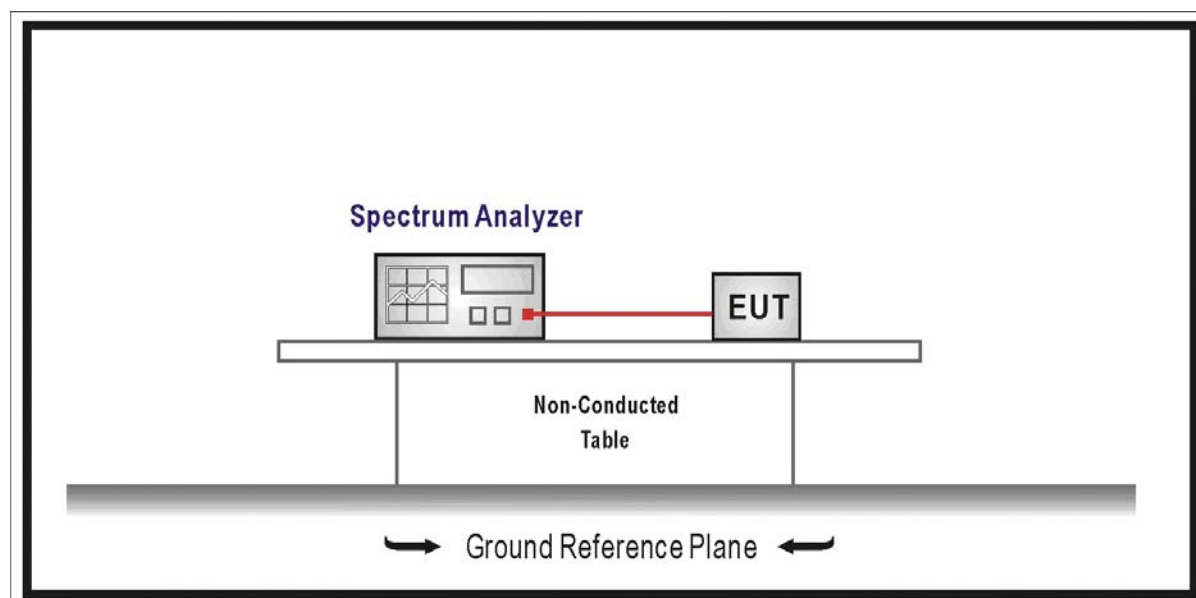
5. 26dBc Occupied Bandwidth

5.1. Test Equipment

26dBc Occupied Bandwidth / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

5.2. Test Setup



5.3. Limit

N/A

5.4. Test Procedure

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer.
- Add a correction factor to the display, and then test.

5.5. Uncertainty

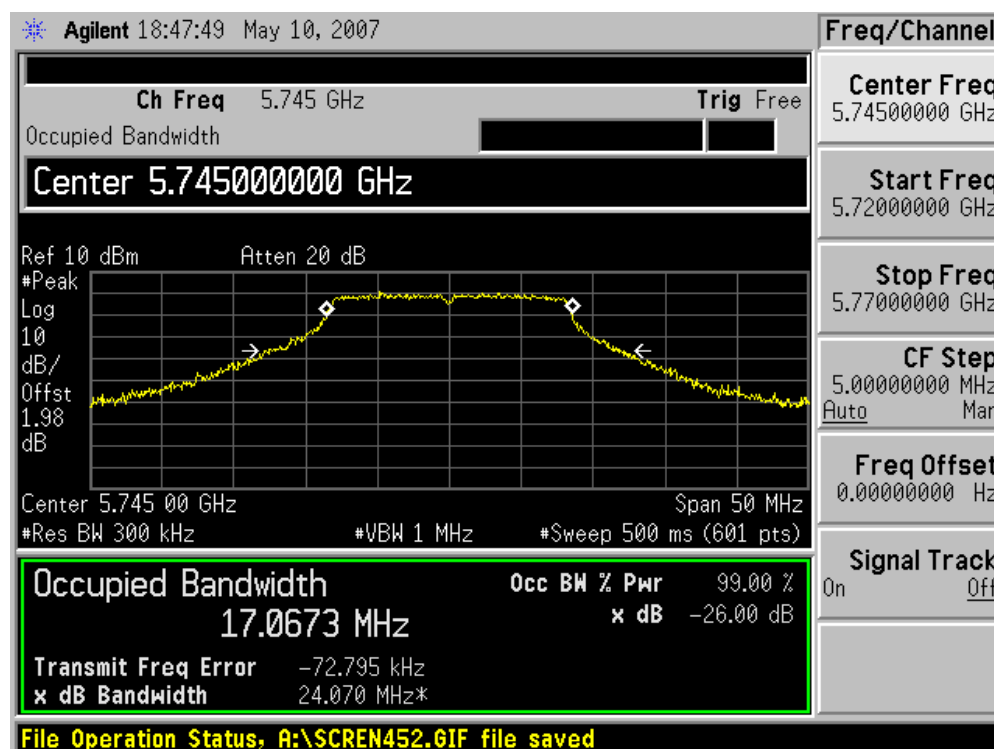
The measurement uncertainty is defined as ± 100 Hz

5.6. Test Result

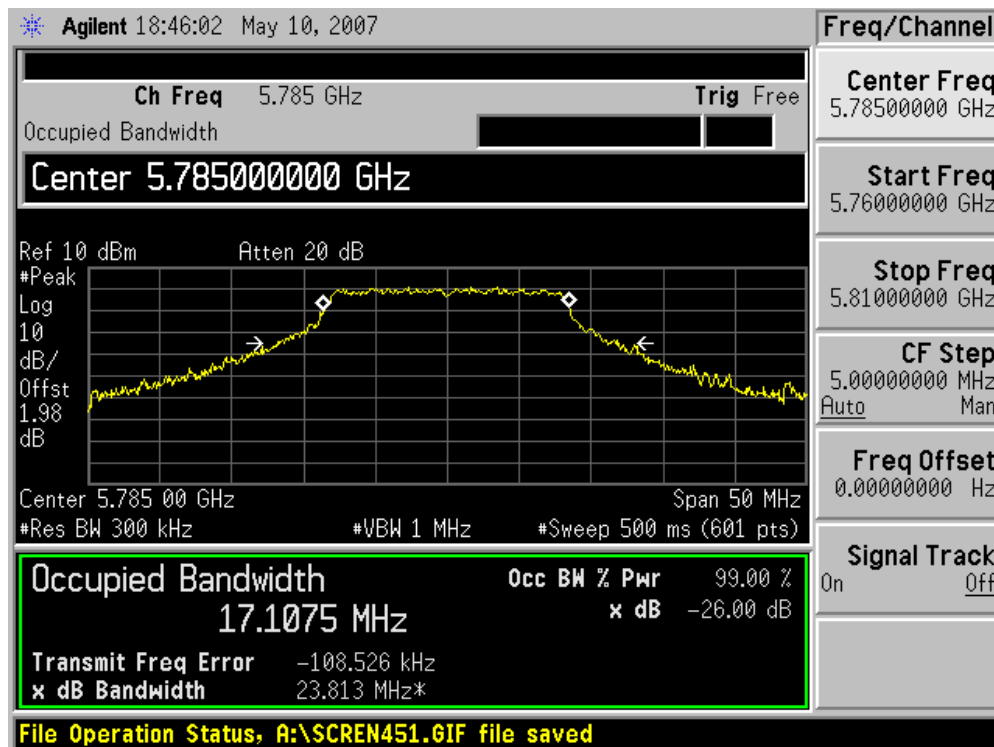
Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	26dBc Occupied Bandwidth
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	5745	24070	N/A	N/A
03	5785	23813	N/A	N/A
04	5805	24450	N/A	N/A

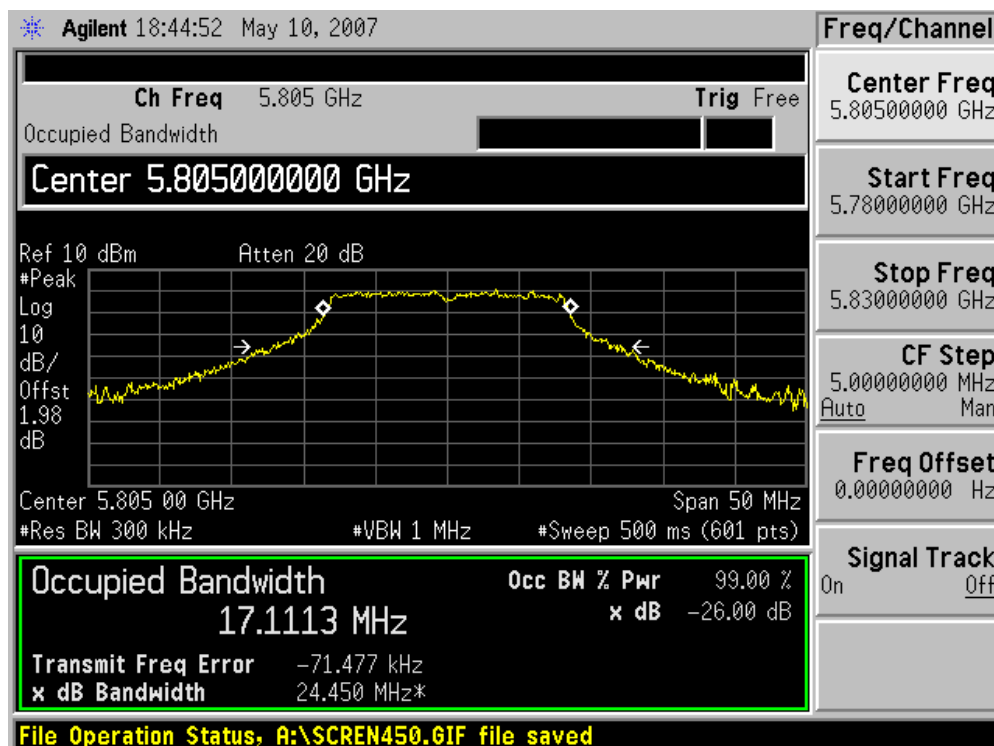
Channel 01 (5745MHz)



Channel 03 (5785MHz)



Channel 04 (5805MHz)



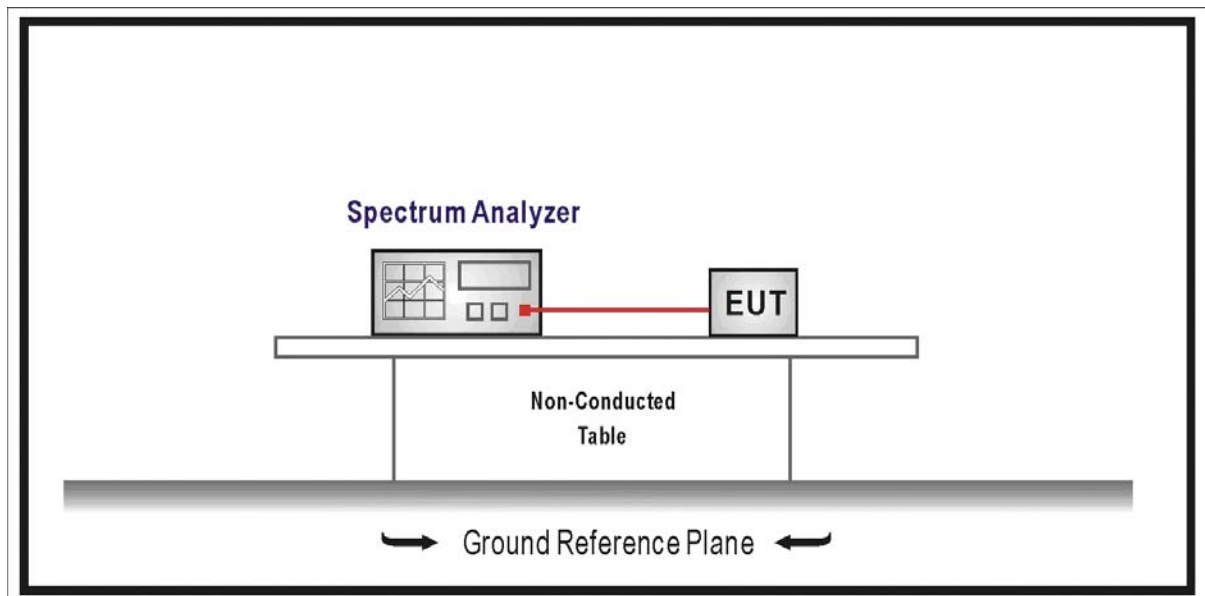
6. Peak Power Output

6.1. Test Equipment

Peak Power Output / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

6.2. Test Setup



6.3. Limit

- (1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + $10\log B$, where B is the 26 dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (2) For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + $10\log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antenna of directional gain greater than 6 dBi are used,

the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

- (3) For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or $17 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power for each 1 dB of antenna gain in excess of 23 dBi would be required.

6.4. Test Procedure

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
- c) Add a correction factor to the display, and then test.
- d) The maximum conducted output power must be measured over an interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement conforming to the above definitions for the emission in question.

6.5. Uncertainty

The measurement uncertainty is defined as $\pm 1.27 \text{ dB}$

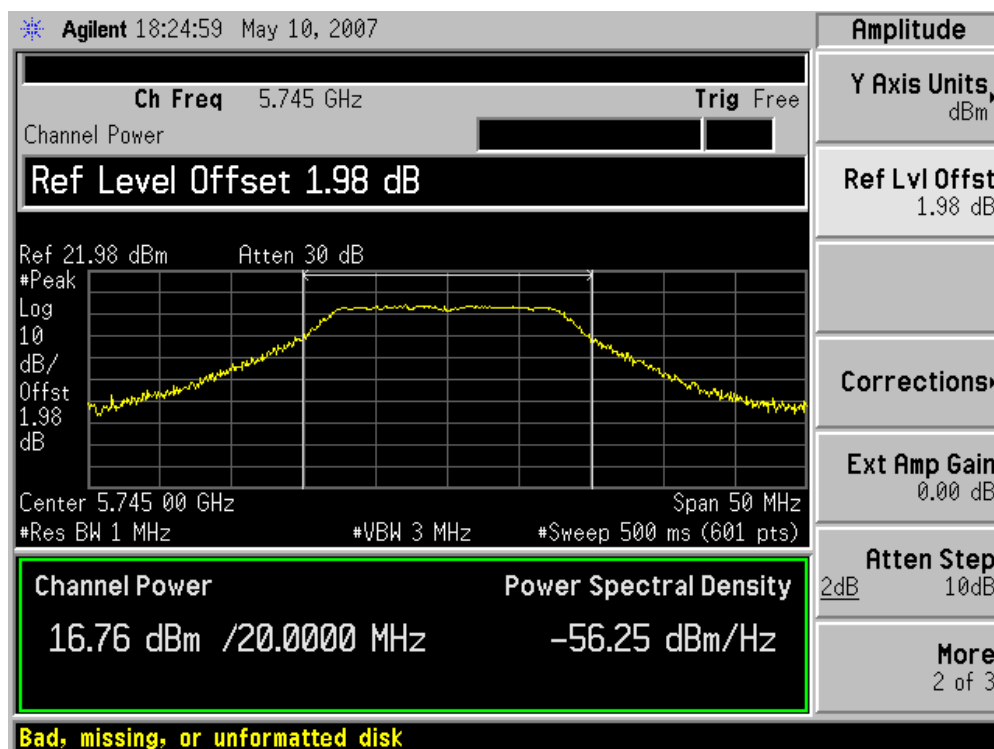
6.6. Test Result

Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Peak Power Output
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

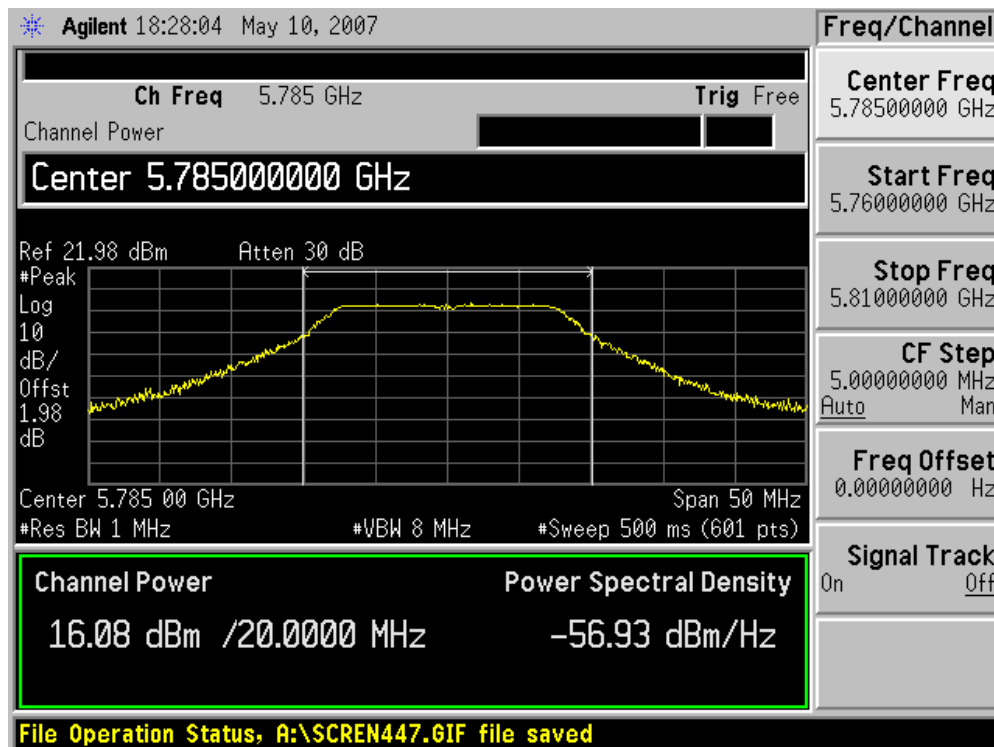
Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit (dBm)	Result
01	5745	16.76	1W or 17dBm+10log B	Pass
03	5785	16.08	1W or 17dBm+10log B	Pass
04	5805	16.77	1W or 17dBm+10log B	Pass

Note: where B is the 26 dB emission bandwidth in MHz.

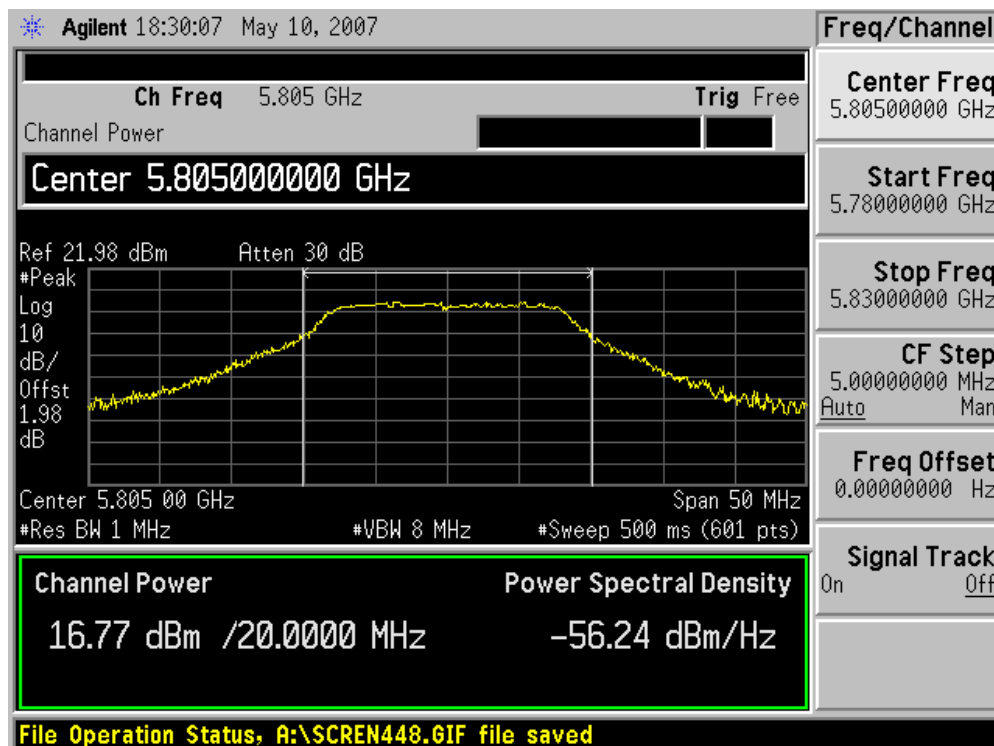
Channel 01 (5745MHz)



Channel 03 (5785MHz)



Channel 04 (5805MHz)



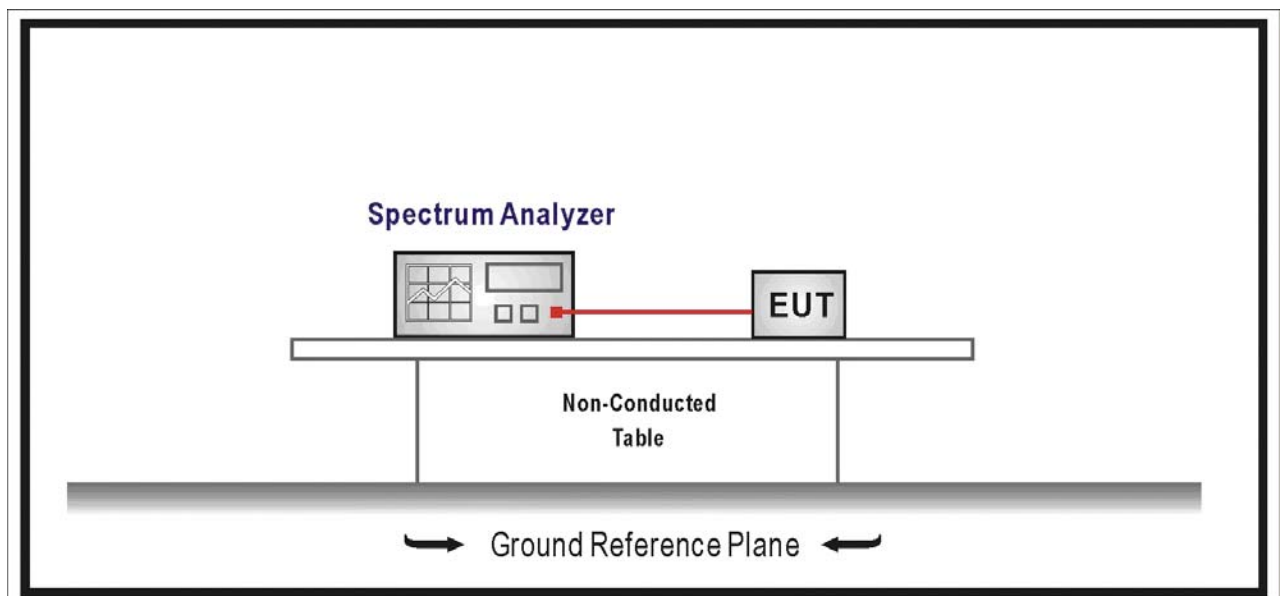
7. Peak Power Spectral Density

7.1. Test Equipment

Peak Power Spectral Density / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

7.2. Test Setup



7.3. Limit

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1 - MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (2) For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed

17 dBm in any 1 - MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

7.4. Test Procedure

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
- c) Add a correction factor to the display, and then test.
- d) The peak power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A resolution bandwidth less than the measurement bandwidth can be used, provided that the measured power is integrated to show total power over the measurement bandwidth. If the resolution bandwidth is approximately equal to the measurement bandwidth, and much less than the emission bandwidth of the equipment under test, the measured results shall be corrected to account for any difference between the resolution bandwidth of the test instrument and its actual noise bandwidth.

7.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

7.6. Test Result

Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Peak Power Spectral Density
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Channel	Frequency (MHz)	Power Spectral Density (dBm/1MHz)	Limit (dBm/1MHz)	Result
01	5745	6.02	17	Pass
03	5785	4.86	17	Pass
04	5805	7.43	17	Pass

Figure Channel 01 (5745MHz)

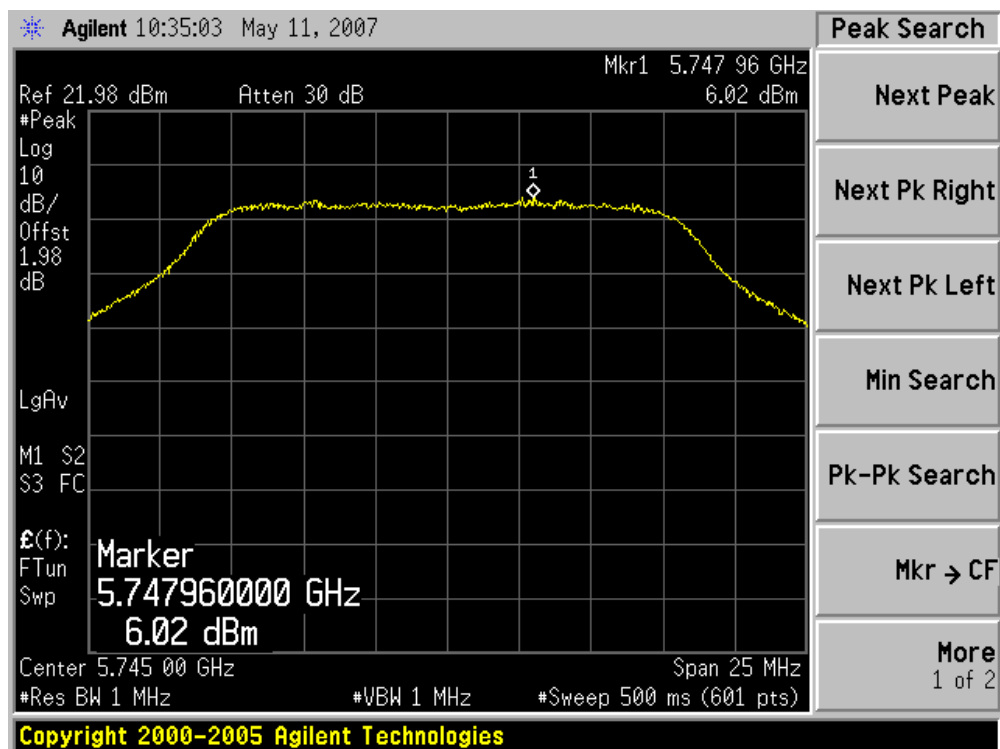


Figure Channel 03 (5785MHz)

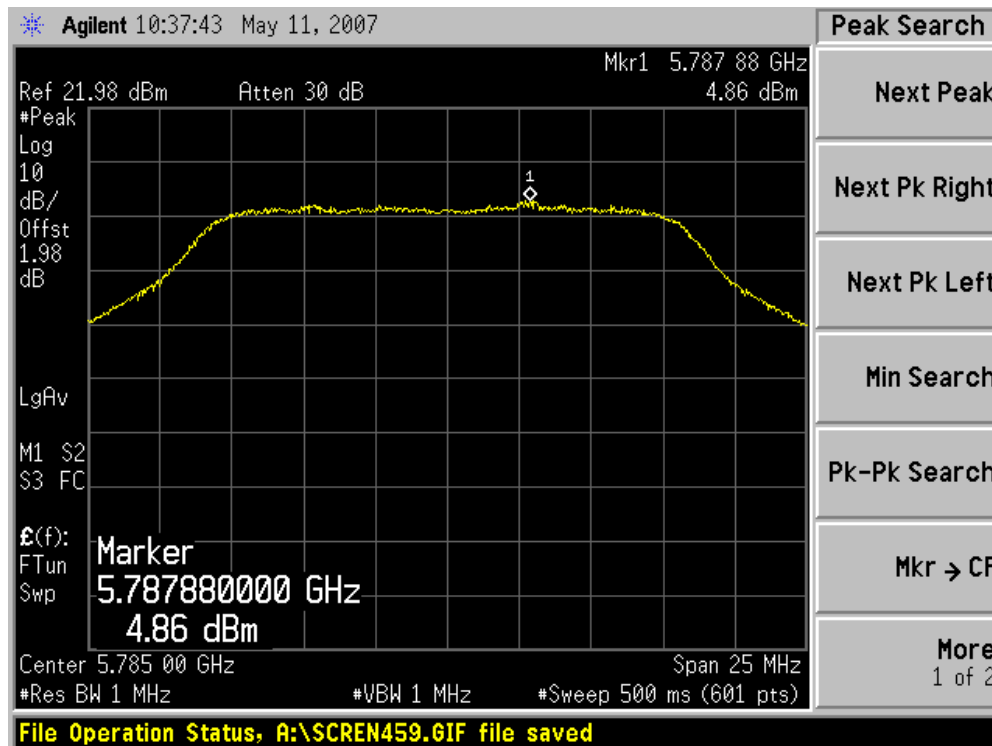
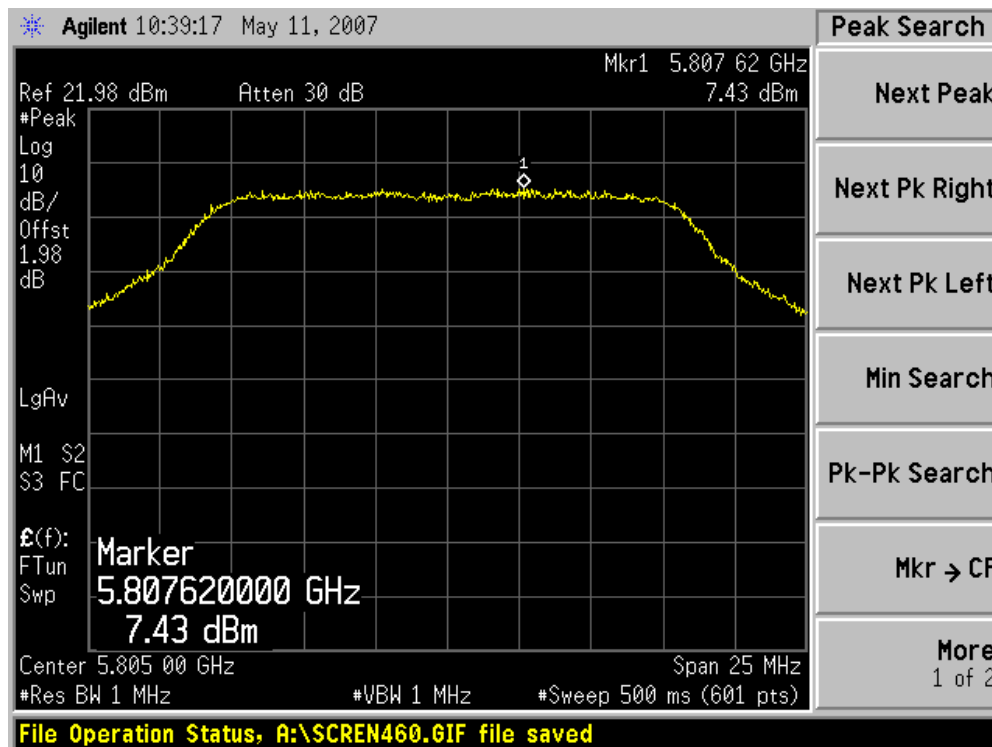


Figure Channel 04 (5805MHz)



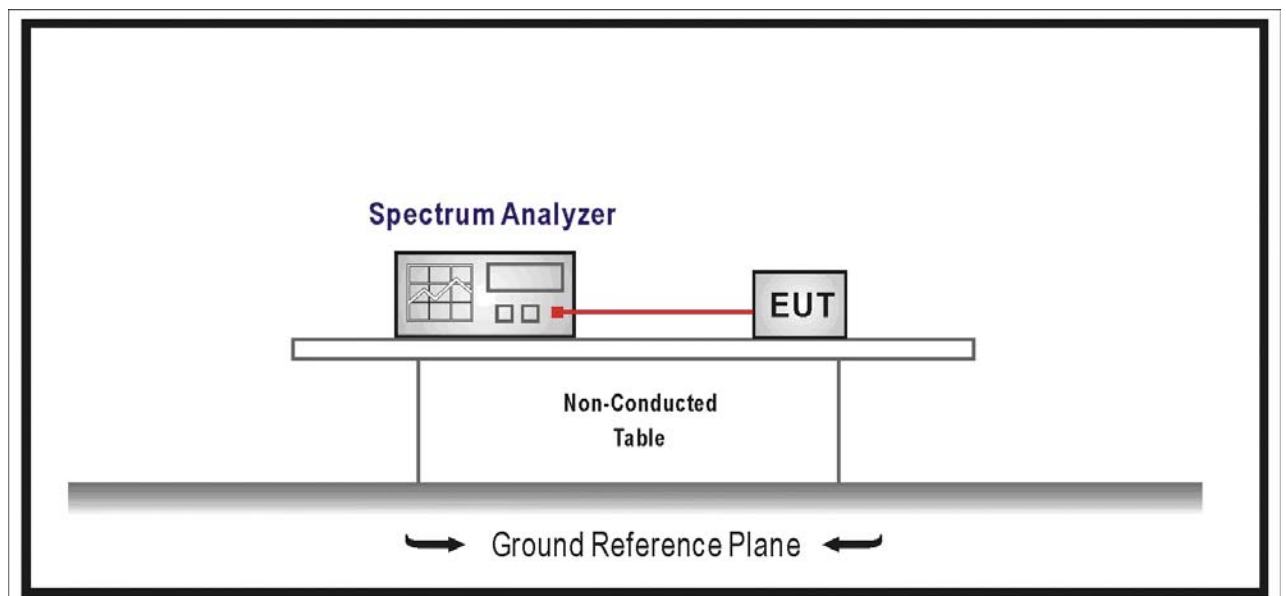
8. Peak Excursion

8.1. Test Equipment

Peak Excursion / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

8.2. Test Setup



8.3. Limit

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

8.4. Test Procedure

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer.
- Add a correction factor to the display, and then test.

8.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

8.6. Test Result

Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Peak Excursion
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Result
01	5745	9.66	17	Pass
03	5785	9.55	17	Pass
04	5805	8.47	17	Pass

Figure Channel 01 (5745MHz)

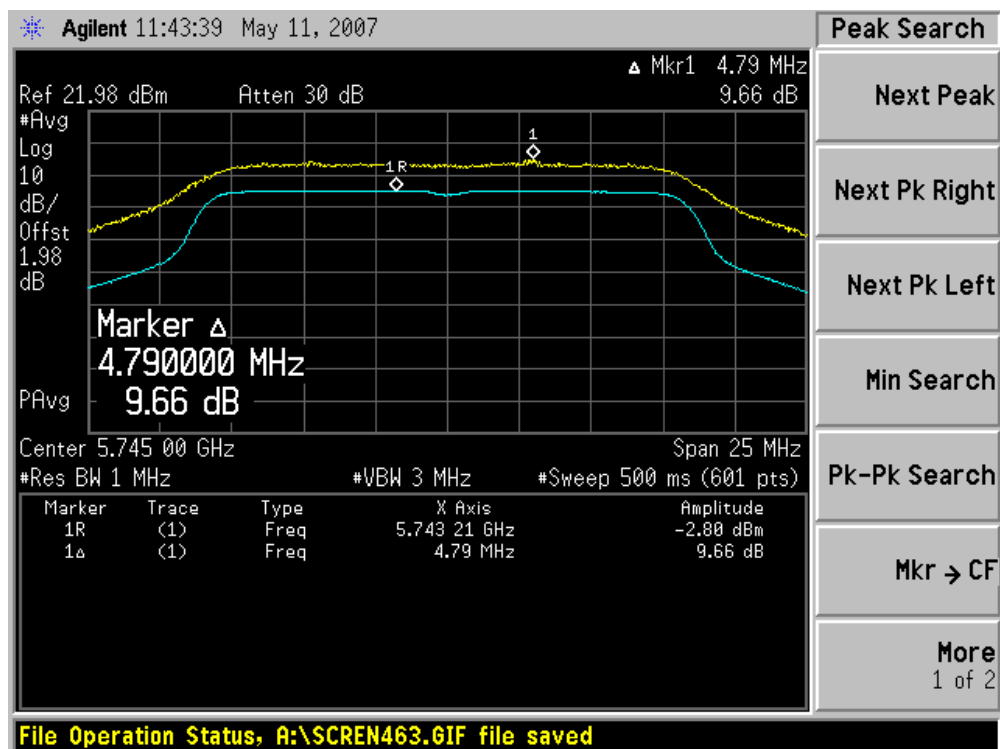


Figure Channel 03 (5785MHz)

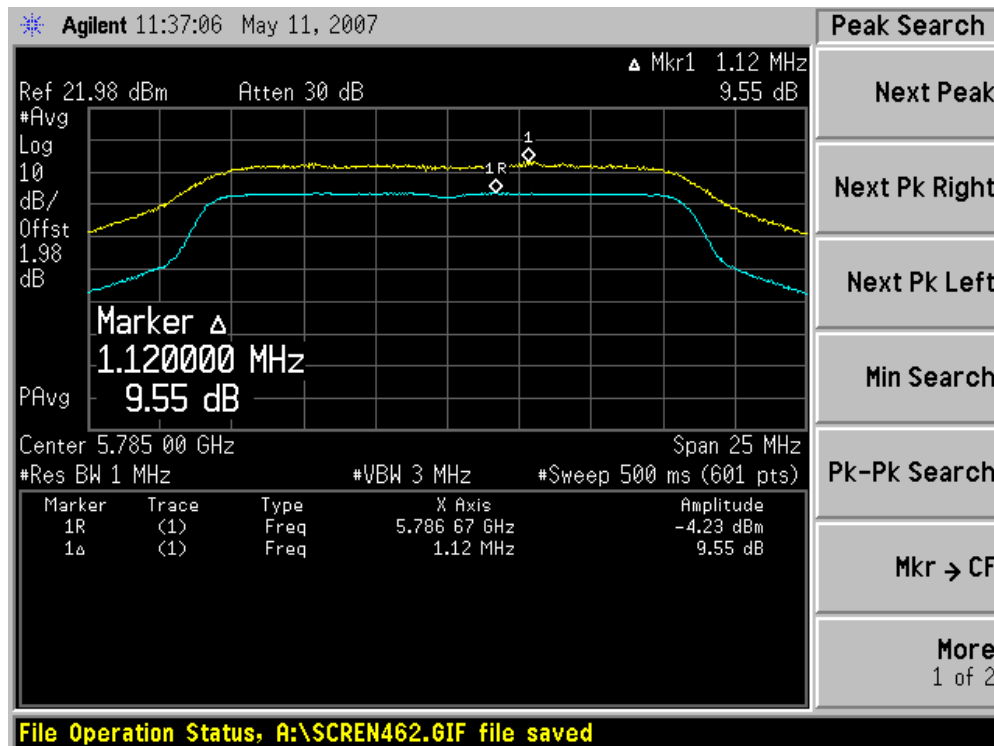
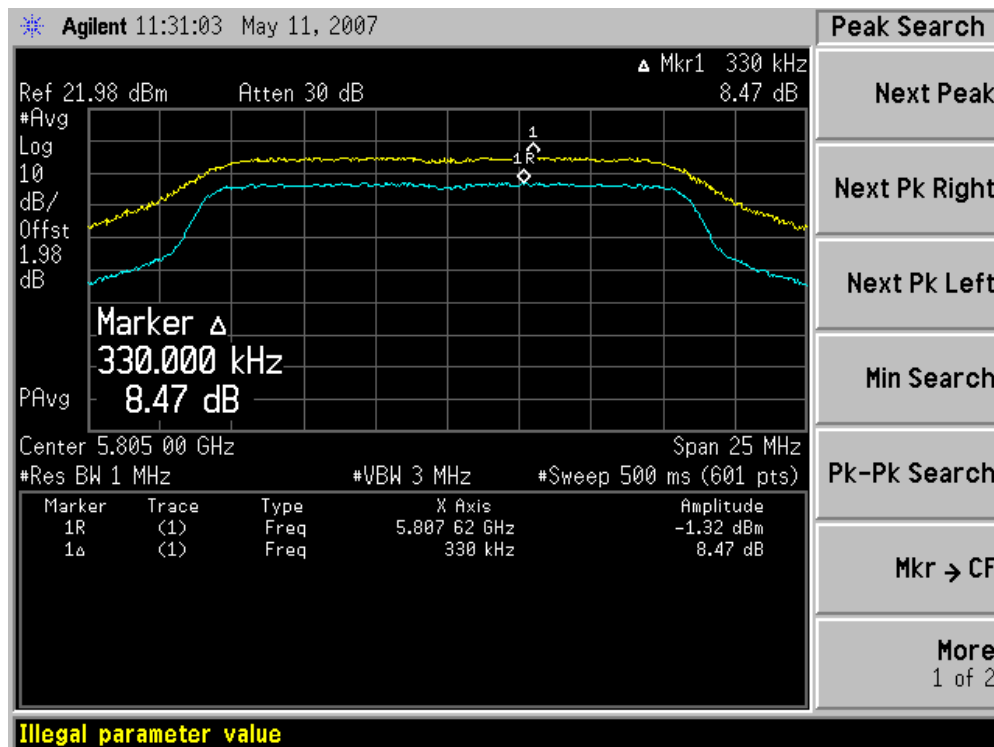


Figure Channel 04 (5805MHz)



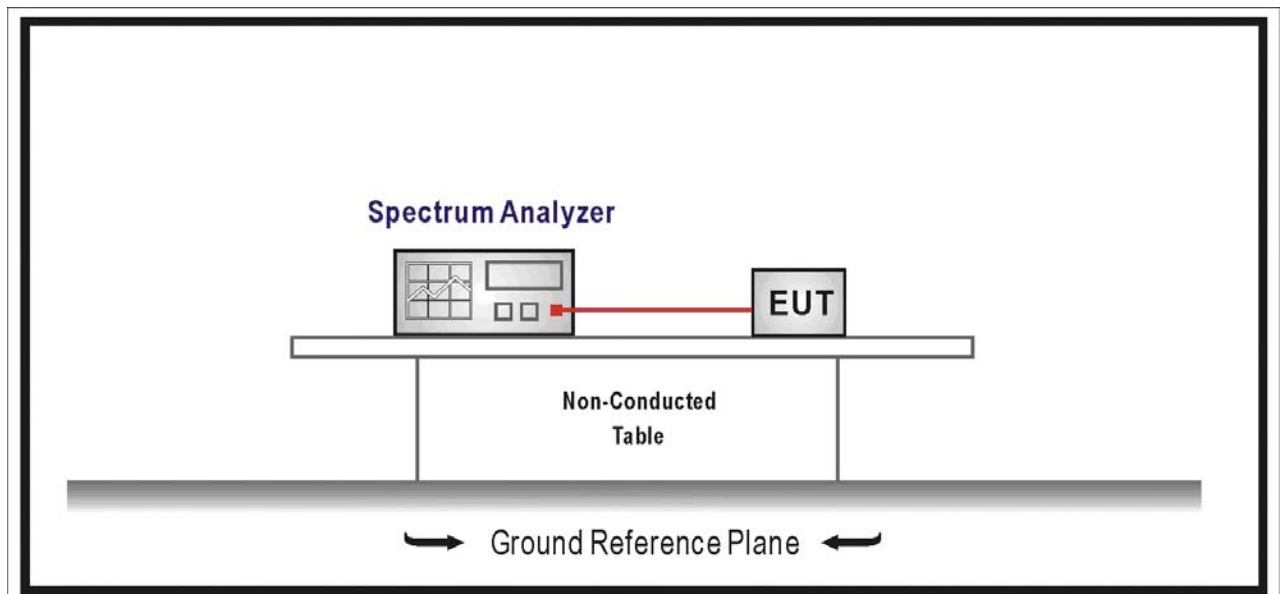
9. Band Edge

9.1. Test Equipment

Band Edge / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

9.2. Test Setup



9.3. Limit

For 15.215(C) requirement:

Intentional radiators operating under the alternative provisions to the general emission limits as contained in 15.217 through 15.257 and in Subpart E of FCC part 15, must be designed to ensure that 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

For 15.407(b) requirement:

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emission outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.825 GHz band: all emission within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.

9.4. Test Procedure

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer.
- c) Add a correction factor to the display, and then test.
- d) The Band Edge emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

9.5. Uncertainty

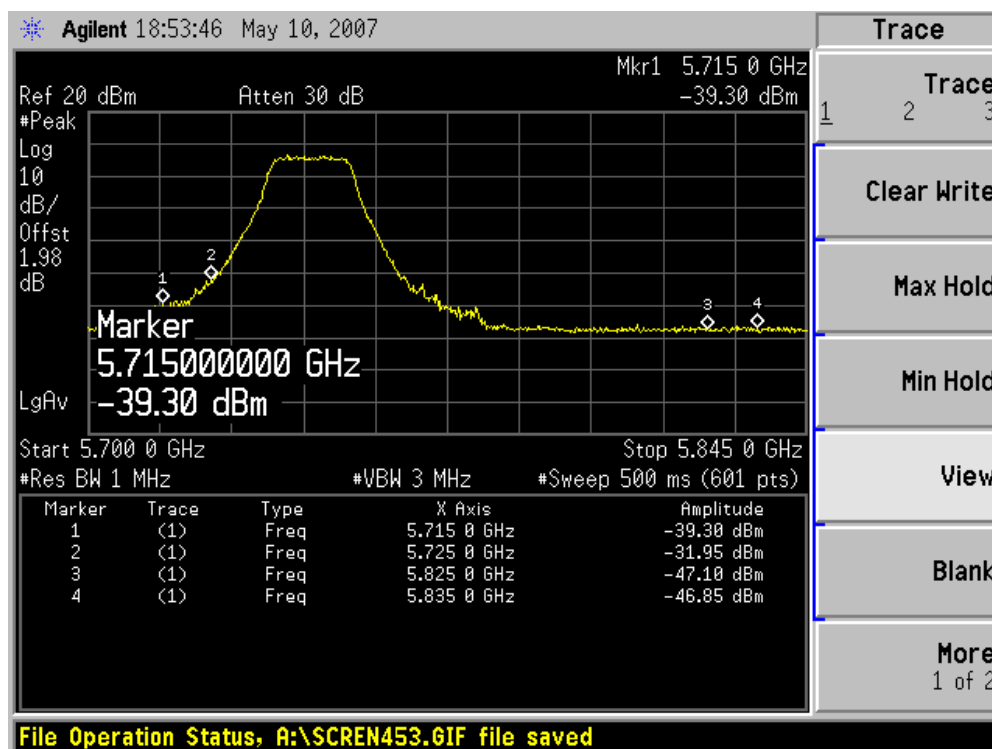
The measurement uncertainty is defined as ± 1.27 dB

9.6. Test Result

Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Channel	Frequency (MHz)	Antenna Gain (dBi)	Reading Level (dBm/MHz)	Level (dBm/MHz)	EIRP Limit (dBm/MHz)	Result
01 (5745MHz)	5175	2	-39.30	-37.30	-27	Pass
	5725	2	-31.95	-29.95	-17	Pass
	5825	2	-47.10	-45.10	-17	Pass
	5835	2	-46.85	-44.85	-27	Pass

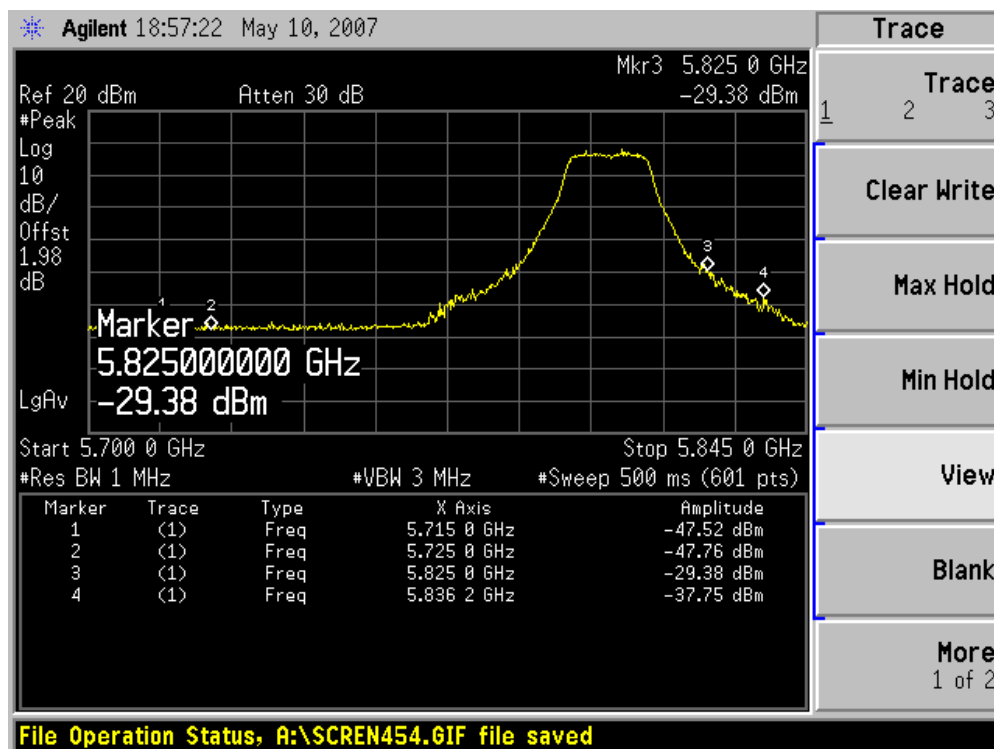
Figure Channel 01 (5745MHz)



Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Band Edge
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Channel	Frequency (MHz)	Antenna Gain (dBi)	Reading Level (dBm/MHz)	Level (dBm/MHz)	EIRP Limit (dBm/MHz)	Result
04 (5805MHz)	5175	2	-47.52	-45.52	-27	Pass
	5725	2	-47.76	-45.76	-17	Pass
	5825	2	-29.38	-27.38	-17	Pass
	5835	2	-37.75	-35.75	-27	Pass

Figure Channel 04 (5805MHz)



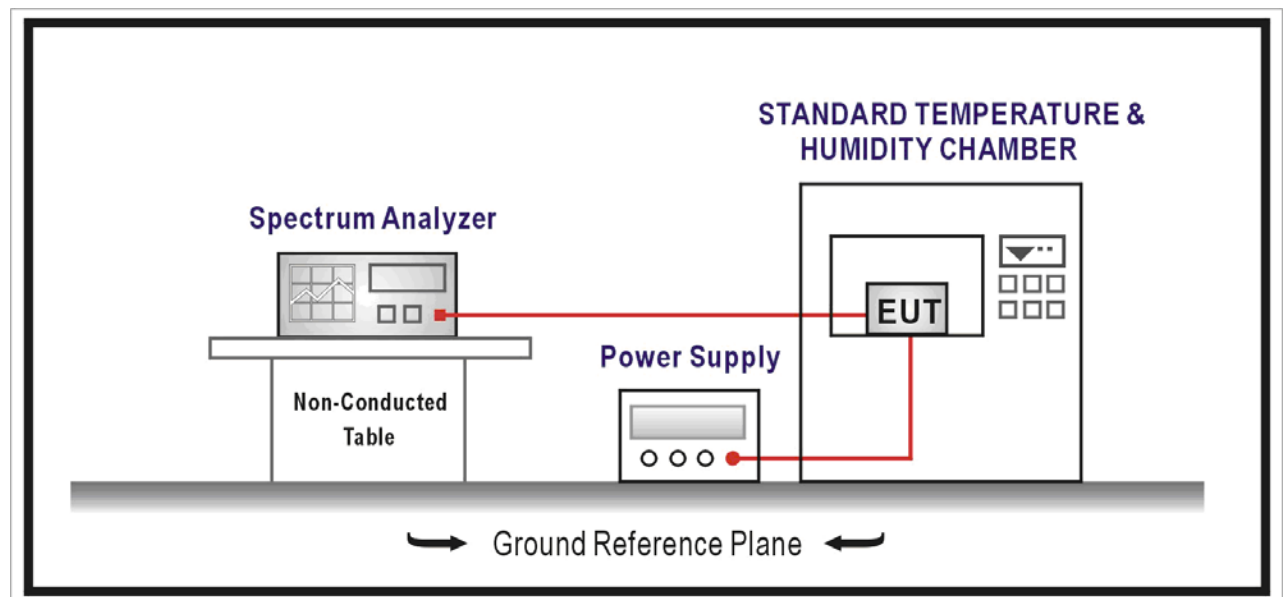
10. Frequency Stability

10.1. Test Equipment

Frequency Stability / AC-3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2007/06/11
AC Power Supply	IDRC	CF-500TP	979422	2007/03/09
DC Power Supply	IDRC	CD-035-020PR	977272	2007/02/02
Programmable Temperature & Humidity Chamber	Gaoyu	TH-1P-B	WIT-05121302	2007/01/19
Coaxial Cable	Huber+Suhner	AC3-RF	08	2006/11/25
Temperature/Humidity Meter	zhicheng	ZC1-2	QT-TH003	2007/03/31

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

10.4. Test Procedure

Frequency Stability Under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

10.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz.

10.6. Test Result

Product	:	Wireless Outdoor Bridge (ZA-4000)
Test Item	:	Frequency Stability
Test Site	:	AC-3
Test Mode	:	Mode 1: Transmit by 802.11a

Operating Frequency: Channel 149 (5745MHz)									Limit: 0.02%
Temp (°C)	Voltage (VAC)	0 minutes		2 minutes		5 minutes		10 minutes	
		Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)
-30 °C	102V	5745.0981	0.00171	5745.0970	0.00169	5745.0950	0.00165	5745.0860	0.00150
	120V	5745.0870	0.00151	5745.0860	0.00150	5745.0785	0.00137	5745.0890	0.00155
	138V	5745.0789	0.00137	5745.0790	0.00138	5745.0820	0.00143	5745.0840	0.00146
20 °C	102V	5745.0901	0.00157	5745.0906	0.00158	5745.0916	0.00159	5745.0930	0.00162
	120V	5745.0119	0.00021	5745.0950	0.00165	5745.0821	0.00143	5745.0870	0.00151
	138V	5744.9820	-0.00031	5744.9760	-0.00042	5744.9680	-0.00056	5744.9345	-0.00114
50 °C	102V	5744.9100	-0.00157	5744.9090	-0.00158	5744.8890	-0.00193	5744.9020	-0.00171
	120V	5745.0320	0.00056	5745.0012	0.00002	5745.0068	0.00012	5745.0290	0.00050
	138V	5745.0790	0.00138	5745.0800	0.00139	5745.0900	0.00157	5745.0880	0.00153

Operating Frequency: Channel 153 (5765MHz)									Limit: 0.02%
Temp (°C)	Voltage (VAC)	0 minutes		2 minutes		5 minutes		10 minutes	
		Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)
-30 °C	102V	5765.0681	0.00118	5765.0870	0.00151	5765.0850	0.00147	5765.0760	0.00132
	120V	5765.0770	0.00134	5765.0760	0.00132	5765.0885	0.00154	5765.0760	0.00132
	138V	5765.0929	0.00161	5765.0690	0.00120	5765.0920	0.00160	5765.0840	0.00146
20 °C	102V	5765.0861	0.00149	5765.0306	0.00053	5765.0816	0.00142	5765.0820	0.00142
	120V	5765.0310	0.00054	5765.0450	0.00078	5765.0921	0.00160	5765.0920	0.00160
	138V	5765.0320	0.00056	5764.9760	-0.00042	5764.9680	-0.00056	5764.9505	-0.00086
50 °C	102V	5764.9100	-0.00156	5764.9090	-0.00158	5764.8890	-0.00193	5764.9020	-0.00170
	120V	5765.0420	0.00073	5765.0312	0.00054	5765.0168	0.00029	5765.0290	0.00050
	138V	5765.0780	0.00135	5765.0730	0.00127	5765.0920	0.00160	5765.0780	0.00135

Operating Frequency: Channel 157 (5785MHz)									Limit: 0.02%
Temp (°C)	Voltage (VAC)	0 minutes		2 minutes		5 minutes		10 minutes	
		Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)
-30 °C	102V	5785.0781	0.00135	5785.0930	0.00161	5785.0930	0.00161	5785.0820	0.00142
	120V	5785.0930	0.00161	5785.0910	0.00157	5785.0765	0.00132	5785.0870	0.00150
	138V	5785.0749	0.00129	5785.0690	0.00119	5785.0820	0.00142	5785.0820	0.00142
20 °C	102V	5785.0921	0.00159	5785.0606	0.00105	5785.0936	0.00162	5785.0920	0.00159
	120V	5785.0660	0.00114	5785.0450	0.00078	5785.0871	0.00151	5785.0820	0.00142
	138V	5784.9320	-0.00118	5784.9360	-0.00111	5784.8680	-0.00228	5784.9205	-0.00137
50 °C	102V	5784.8900	-0.00190	5784.9060	-0.00162	5784.8990	-0.00175	5784.9120	-0.00152
	120V	5785.0420	0.00073	5785.0512	0.00089	5785.0168	0.00029	5785.0090	0.00016
	138V	5785.0750	0.00130	5785.0840	0.00145	5785.0940	0.00162	5785.0880	0.00152

Operating Frequency: Channel 161 (5805MHz)									Limit: 0.02%
Temp (°C)	Voltage (VAC)	0 minutes		2 minutes		5 minutes		10 minutes	
		Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)	Measured (MHz)	Tolerance (%)
-30 °C	102V	5805.0881	0.00152	5805.0670	0.00115	5805.0950	0.00163	5805.0960	0.00165
	120V	5805.0940	0.00162	5805.0590	0.00102	5805.0785	0.00135	5805.0860	0.00148
	138V	5805.0799	0.00138	5805.0780	0.00134	5805.0820	0.00141	5805.0800	0.00137
20 °C	102V	5805.0941	0.00162	5805.0936	0.00161	5805.0916	0.00157	5805.0920	0.00158
	120V	5805.0410	0.00071	5805.0752	0.00130	5805.0821	0.00141	5805.0820	0.00141
	138V	5804.9720	-0.00048	5804.9460	-0.00093	5804.9680	-0.00055	5804.9505	-0.00085
50 °C	102V	5804.9140	-0.00148	5804.9090	-0.00157	5804.8890	-0.00191	5804.9020	-0.00168
	120V	5805.0120	0.00021	5805.0012	0.00002	5805.0068	0.00011	5805.0090	0.00015
	138V	5805.0690	0.00119	5805.0800	0.00138	5805.0900	0.00155	5805.0980	0.00168