

FCC Part15C/RSS-210 Test Report

For FCC Class II Permission Change

Product Name : Bluetooth In-car Speakerphone
Model No. : K100
FCC ID : AL8-K100
IC : 457A-K100

Applicant : Plantronics, Inc.

Address : 345 Encinal Street, Santa Cruz, CA95060 USA

Date of Receipt : Aug. 11, 2010
Test Date : Aug.11, 2010 ~ Aug. 12, 2010
Issued Date : Aug. 17, 2010
Report No. : 108S034R-RF-US-P10V02
Report Version : V 1.0

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, NVLAP or any agency of the Government.

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Test Report Certification

Issued Date: Aug. 13, 2010
 Report No.: 108S034R-HP-US-P10V02



Product Name : Bluetooth In-car Speakerphone
 Applicant : Plantronics, Inc.
 Address : 345 Encinal Street, Santa Cruz, CA95060 USA
 Manufacturer : Weifang GoerTek Electronics Co., Ltd
 Address : Dongfang North Road Hi-tech Industry Development District,
 Weifang Shangdong, China
 Model No. : K100
 FCC ID : AL8-K100
 IC : 457A-K100
 EUT Voltage : DC 3.7V
 Brand Name : Plantronics
 Applicable Standard : FCC Part 15 Subpart C: 2008
 RSS-210, Issue 7: 2007, Annex 2 A2.8
 ANSI C63.4: 2009
 ANSI C63.10: 2009
 Test Result : Complied
 Performed Location : SuZhou EMC laboratory
 No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech
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 FCC Registration Number: 800392, IC Lab Code: 4075B

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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

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/emc/accreditations/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:

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1. General Information

1.1. EUT Description

Product Name	Bluetooth In-car Speakerphone
Trade Name	Plantronics
Model No.	K100
Working Voltage	DC 3.7V
Support Band	FM Broadcasting Band, 2.4G ISM
Operation Frequency Band	FM: 88.3~89.9MHz; BT: 2402~2480MHz
Operation Mode	Point-to-Point
Channel Space	FM: 400kHz step BT: 1MHz step
Channel Number	FM: 5 channels BT: 79 channels
Type of modulation	FM: Frequency modulation BT: GFSK, Pi/4DQPSK, 8DPSK
Antenna Type	FM: Monopole BT: PCB antenna
Antenna Gain	< 6dBi

Note: the FM antenna of this device was changed, according to FCC Part15.239, the fundamental frequency field and spurious emission were evaluated, and shows test data in this report. The original report was published by SGS Taiwan Ltd. Report number is EF/2010/7005.

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: Transmitting

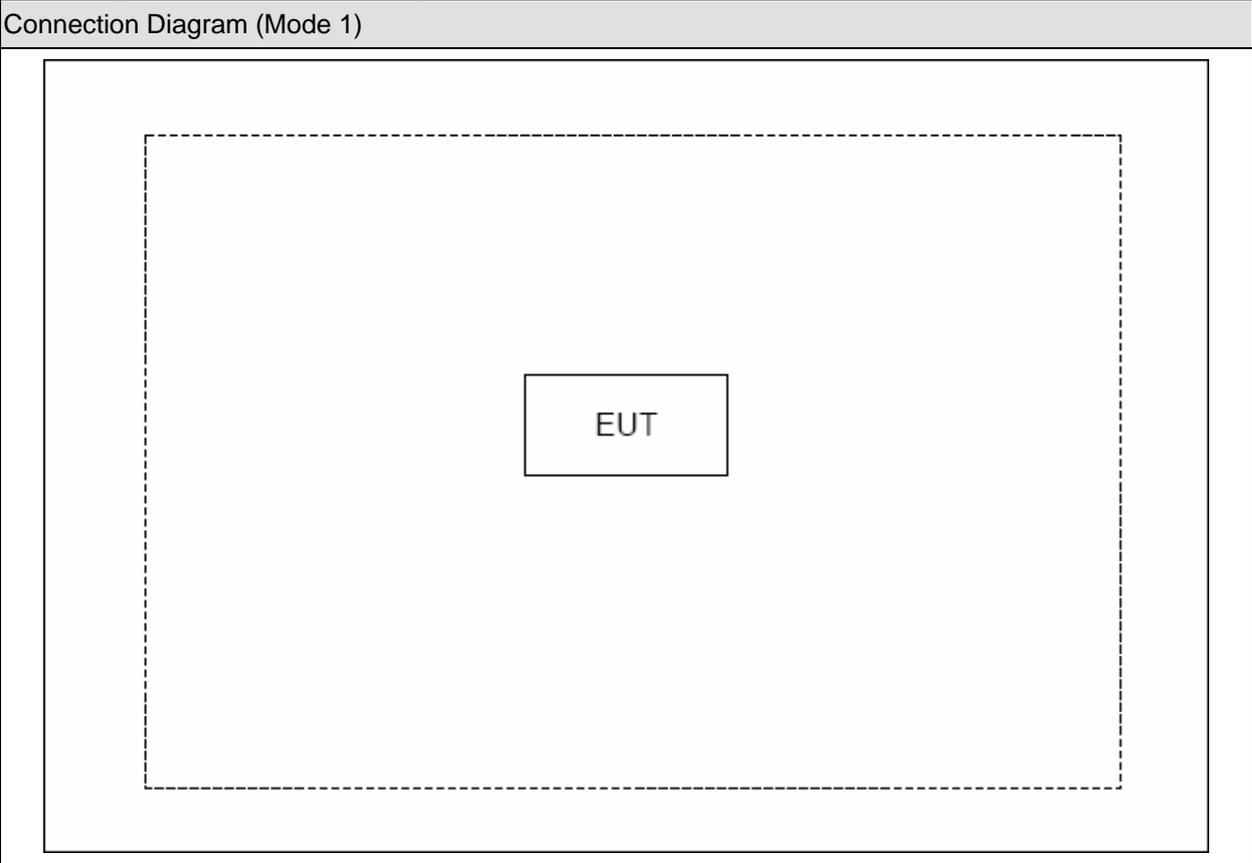
Note: For the portable device, radiated emission test item was evaluated through 3 axes (X, Y, Z), and found the worst case to show in the report.

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	N/A	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Make the EUT link to mobile phone through Bluetooth, and then play 1kHz sound by FM.
3	Select the test channel frequency to start 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 B: 2008 Class B ANSI C63.4: 2009 RSS-210, Issue 7: 2007, Annex 2 A2.8	No	N/A
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B: 2008 Class B ANSI C63.4: 2009 RSS-210, Issue 7: 2007, Annex 2 A2.8	Yes	No
Field Strength of the Fundamental Signal	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.239(b) RSS-210, Issue 7: 2007, Annex 2 A2.8	Yes	No
26dB Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2007 Section 15.239(a) RSS-210, Issue 7: 2007, Annex 2 A2.8	No	N/A

2.2. List of Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCI	100906	2010/01/15
Two-Line V-Network	R&S	ENV216	100043	2010/06/18
Two-Line V-Network	R&S	ENV216	100044	2009/09/07
Balanced Telecom ISN	Fischer	FCC-TLISN-T2-02	20352	2010/01/15
Balanced Telecom ISN	Fischer	FCC-TLISN-T4-02	20353	2010/01/15
Balanced Telecom ISN	Fischer	FCC-TLISN-T8-02	20354	2010/01/15
Current Probe	R&S	EZ-17	100255	2010/04/18
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2010/05/05
50ohm Termination	SHX	TF2	07081401	2009/09/29
50ohm Termination	SHX	TF2	07081402	2009/09/29
50ohm Termination	SHX	TF2	07081403	2009/09/15
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2010/01/14

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2010/04/23
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2009/11/12
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2010/05/05
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2010/01/14

Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2010/04/23
Preamplifier	Quietek	AP-180C	CHM-0602013	2010/05/05
Preamplifier	Quietek	AP-040G	CHM-0906001	2010/05/05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2009/11/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2010/06/11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2010/03/03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2010/03/03
Lowpass Filter	Wainwright	WLKS4500-9SS	SN2	2010/03/03

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.26 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.19 dB.

2.4. Test Environment

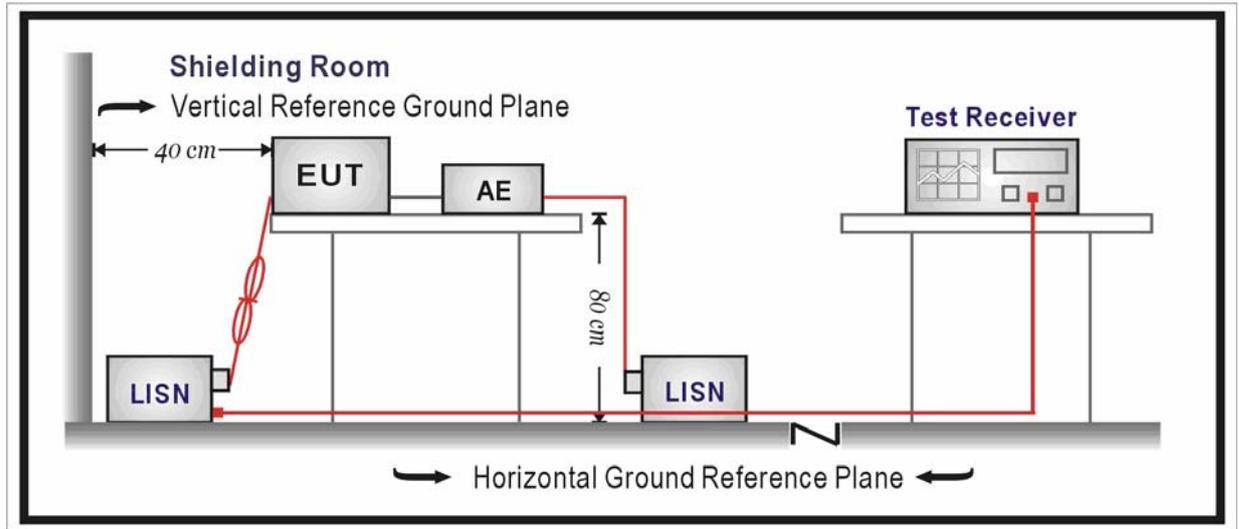
Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	47
	Barometric pressure (mbar)	860-1060	950-1000
Radiated Emission	Temperature (°C)	15-35	28
	Humidity (%RH)	25-75	46
	Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

3.1. Test Specification

According to EMC Standard: FCC Part 15 Subpart C, ANSI C63.4

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart B Paragraph 15.207 Limits		
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

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

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

3.5. Deviation from Test Standard

No deviation.

3.6. Test Result

Not performed.

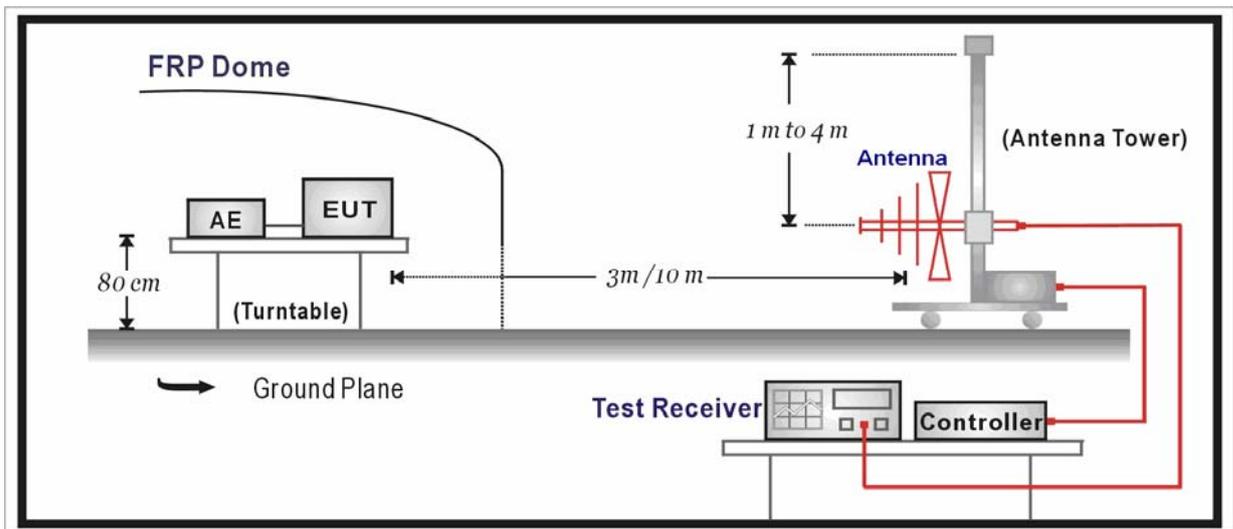
4. Radiated Emission

4.1. Test Specification

According to EMC Standard: FCC Part 15 Subpart C, ANSI C63.4

4.2. Test Setup

Below 1GHz Test Setup:



4.3. Limit

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

Note 1: The lower limit shall apply at the transition frequency.

Note 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.

Note 3: E field strength (dBuV/m) = 20 log E field strength (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. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. 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.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

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

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

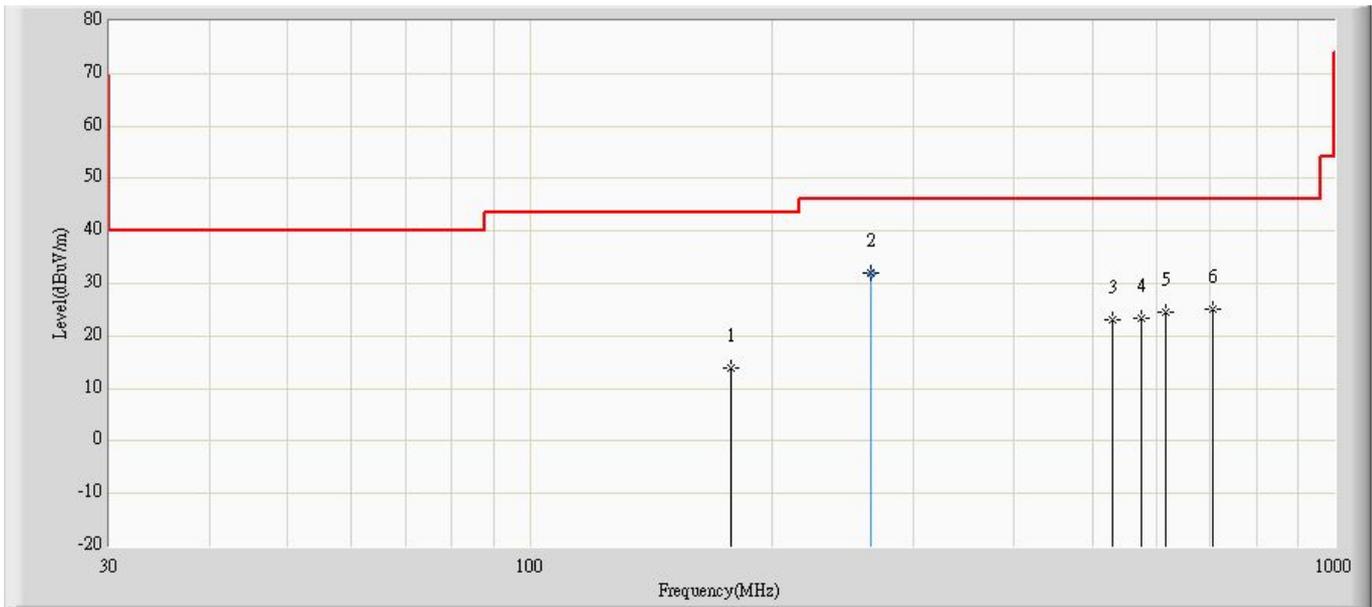
The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCI) is 120 kHz and above 1GHz is 1MHz.

4.5. Deviation from Test Standard

No deviation.

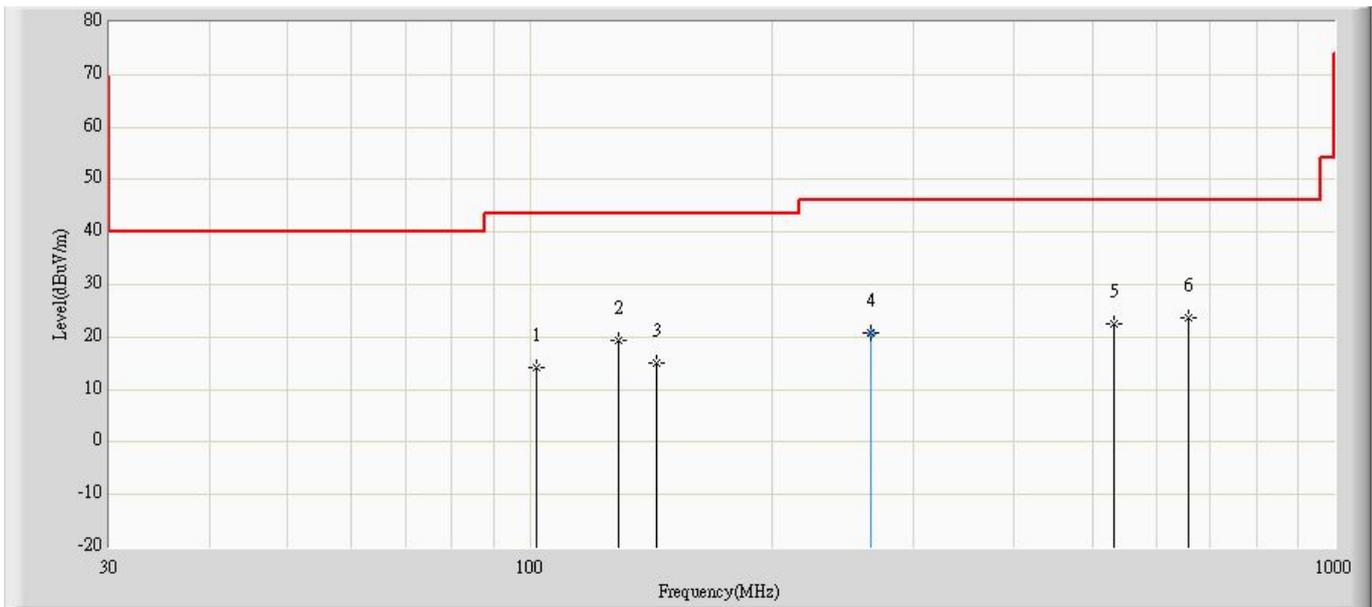
4.6. Test Result

Profile: 20100813	Page No.: 22
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 13:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 88.3MHz (X Axis)	



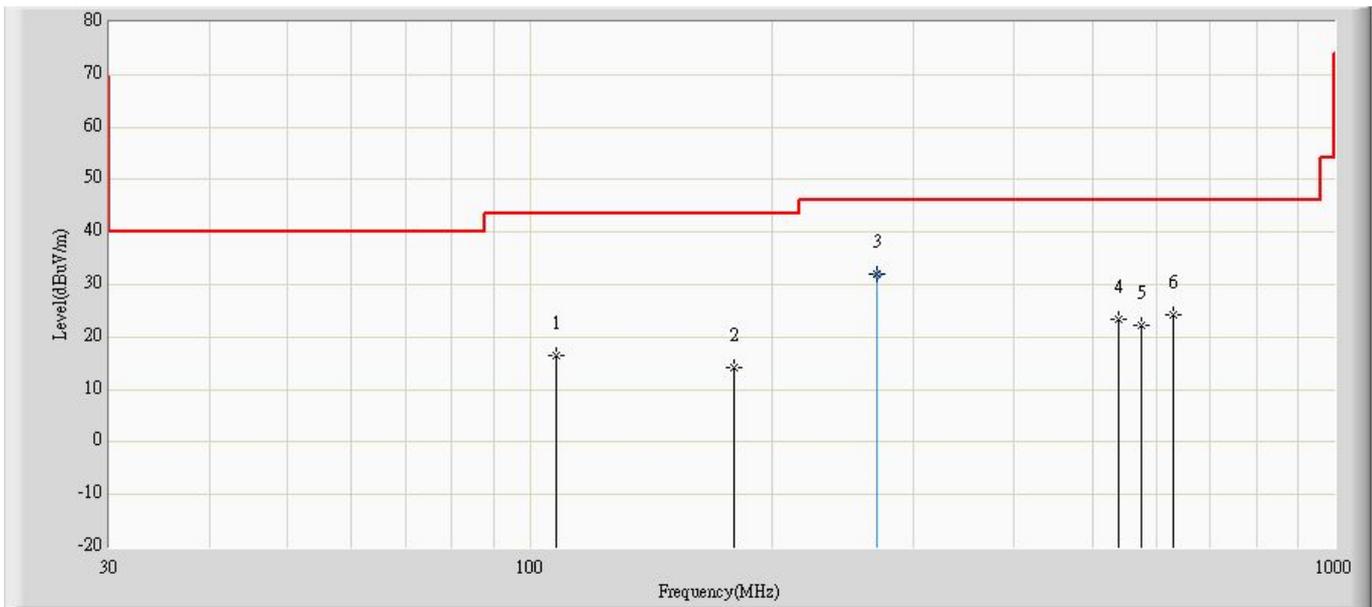
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		177.440	13.801	4.151	-29.699	43.500	9.650	QP
2	*	264.881	31.921	18.200	-14.079	46.000	13.721	QP
3		529.800	23.148	3.948	-22.852	46.000	19.200	QP
4		575.140	23.407	3.457	-22.593	46.000	19.950	QP
5		618.100	24.494	3.932	-21.506	46.000	20.562	QP
6		706.090	25.114	4.164	-20.886	46.000	20.950	QP

Profile: 20100813	Page No.: 23
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 13:16
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 88.3MHz (X Axis)	



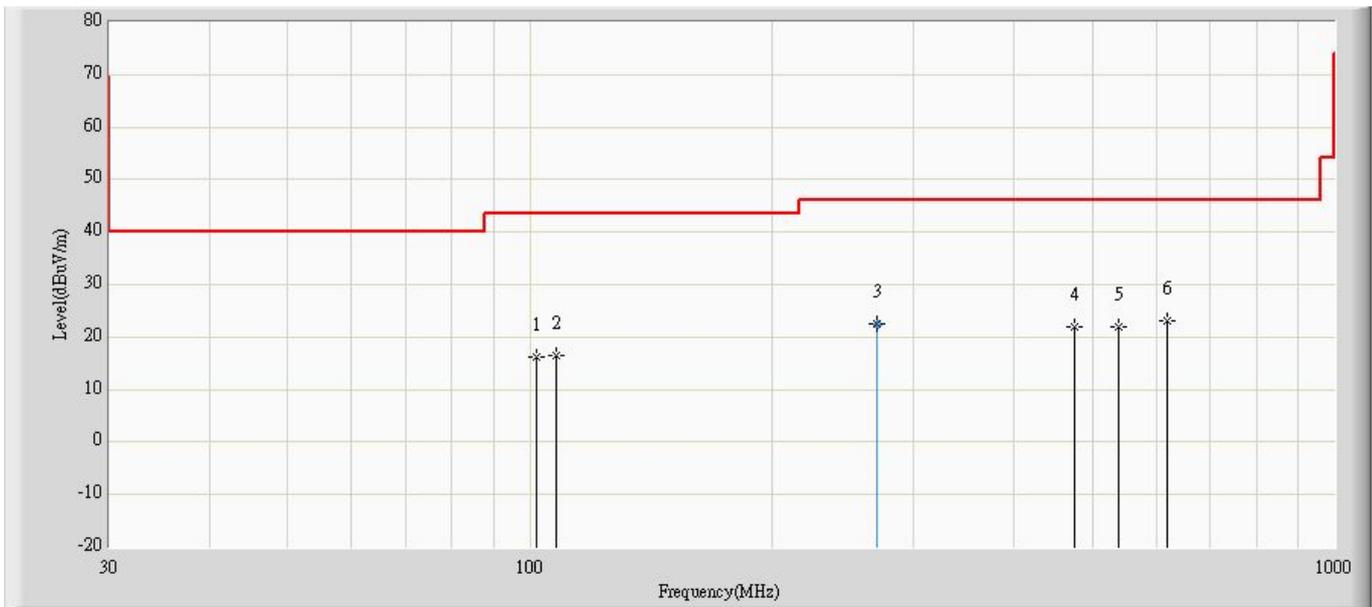
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		101.780	14.194	2.644	-29.306	43.500	11.550	QP
2		128.819	19.383	6.853	-24.117	43.500	12.530	QP
3		143.490	15.154	3.794	-28.346	43.500	11.360	QP
4		264.881	20.921	7.200	-25.079	46.000	13.721	QP
5		531.490	22.538	3.238	-23.462	46.000	19.300	QP
6	*	657.590	23.594	2.904	-22.406	46.000	20.690	QP

Profile: 20100813	Page No.: 24
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 13:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 89.9MHz (X Axis)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		108.000	16.450	4.189	-27.050	43.500	12.261	QP
2		179.380	14.299	4.839	-29.201	43.500	9.460	QP
3	*	269.700	32.128	18.500	-13.872	46.000	13.628	QP
4		539.400	23.489	3.747	-22.511	46.000	19.742	QP
5		575.140	22.353	2.403	-23.647	46.000	19.950	QP
6		629.300	24.171	3.583	-21.829	46.000	20.588	QP

Profile: 20100813	Page No.: 25
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 13:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 89.9MHz (X Axis)	



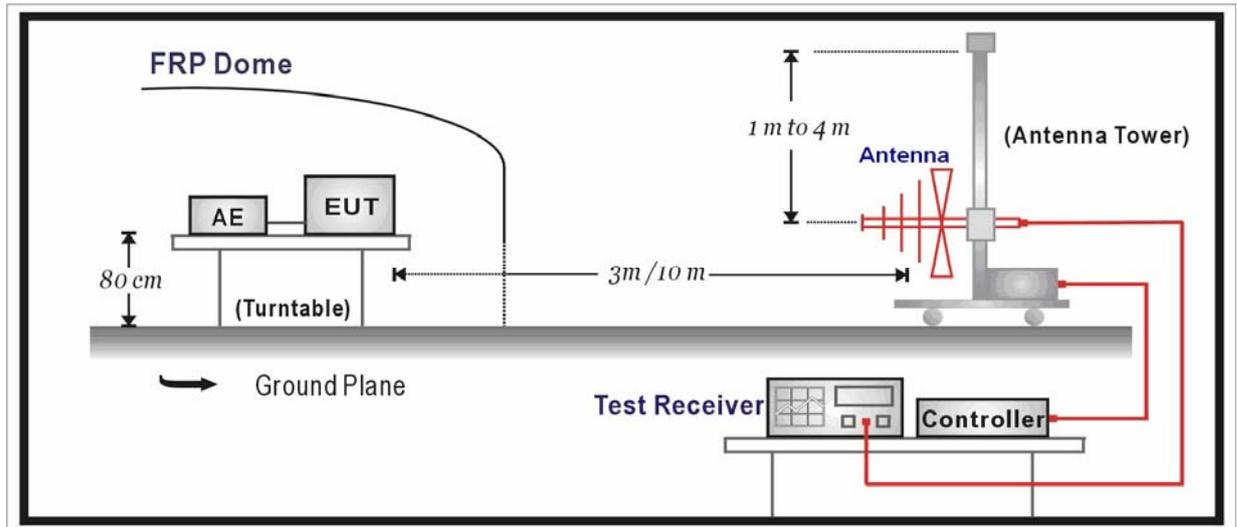
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		101.780	16.194	4.644	-27.306	43.500	11.550	QP
2		108.000	16.504	4.243	-26.996	43.500	12.261	QP
3		269.700	22.428	8.800	-23.572	46.000	13.628	QP
4		475.230	22.051	3.491	-23.949	46.000	18.560	QP
5		539.400	22.081	2.339	-23.919	46.000	19.742	QP
6	*	618.790	23.037	2.447	-22.963	46.000	20.590	QP

5. Field Strength of the Fundamental Signal

5.1. Test Specification

According to EMC Standard: FCC Part 15 Subpart C 15.239, ANSI C63.4

5.2. Test Setup



5.3. Limit

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit is based on measurement instrumentation employing an average detector. The provision in Section 15.35 of standard for limiting peak emissions applies.

5.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

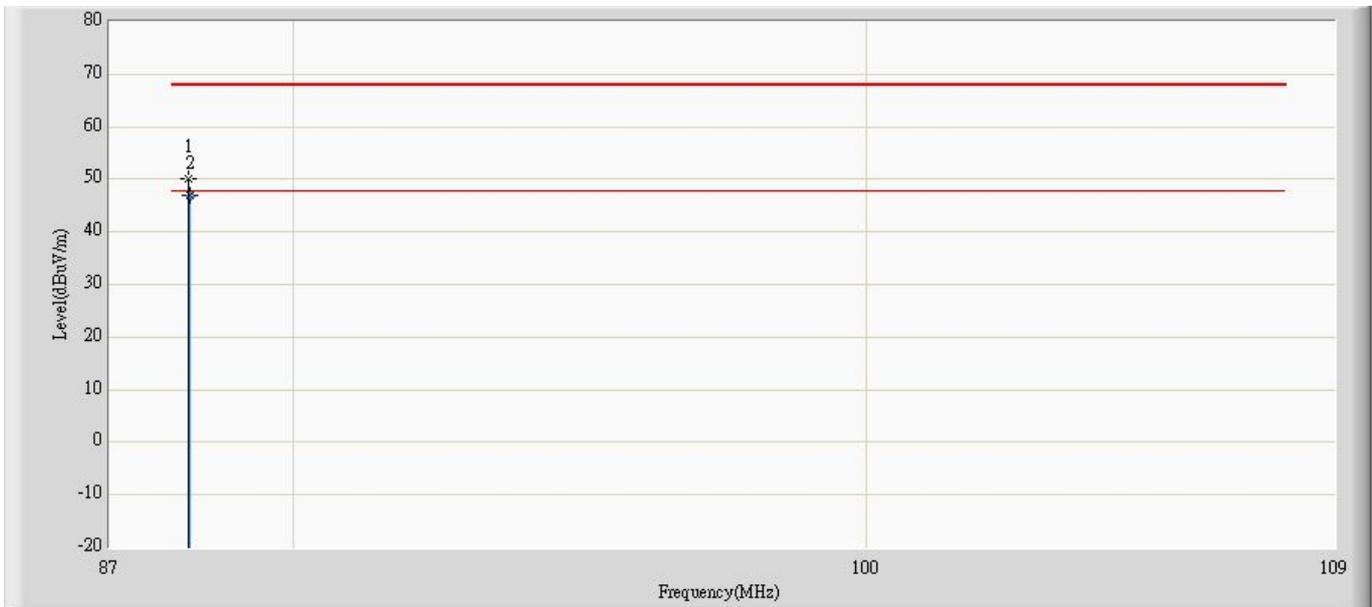
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

5.5. Deviation from Test Standard

No deviation.

5.6. Test Result

Profile: 20100813	Page No.: 16
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 09:16
Limit: FCC_SpartC_15.239_F_03M	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 88.3MHz (X Axis)	



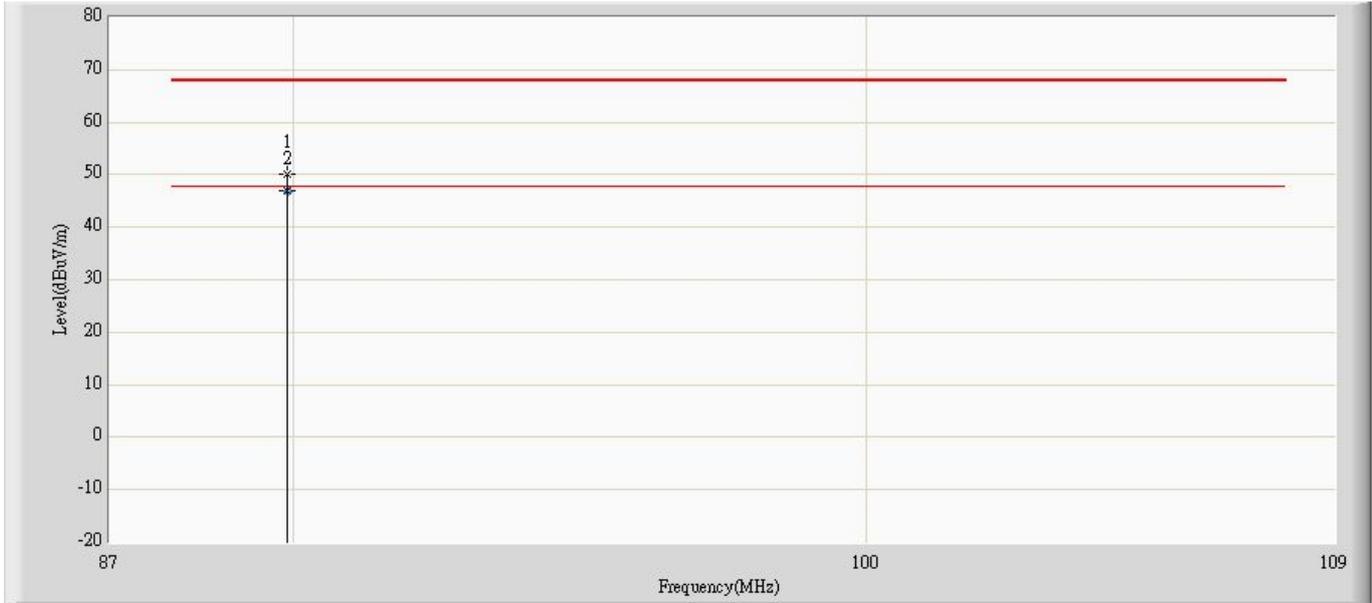
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		88.284	50.195	40.956	-17.755	67.950	9.239	PK
2	*	88.300	46.843	37.600	-1.107	47.950	9.243	AV

Profile: 20100813	Page No.: 17
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 09:17
Limit: FCC_SpartC_15.239_F_03M	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 88.3MHz (X Axis)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		88.284	43.838	34.599	-24.112	67.950	9.239	PK
2	*	88.300	40.443	31.200	-7.507	47.950	9.243	AV

Profile: 20100813	Page No.: 14
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 09:16
Limit: FCC_SpartC_15.239_F_03M	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Horizontal
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 89.9MHz (X Axis)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		89.887	50.201	40.554	-17.749	67.950	9.647	PK
2	*	89.900	46.851	37.200	-1.099	47.950	9.651	AV

Profile: 20100813	Page No.: 15
Engineer: Robin	
Site: AC2	Time: 2010/08/13 - 09:16
Limit: FCC_SpartC_15.239_F_03M	Margin: 0
Probe: CBL6112D_27611(30-1000MHz)	Polarity: Vertical
EUT: FM transmit	Power: DC3.7V
Note: Mode 1: 89.9MHz (X Axis)	



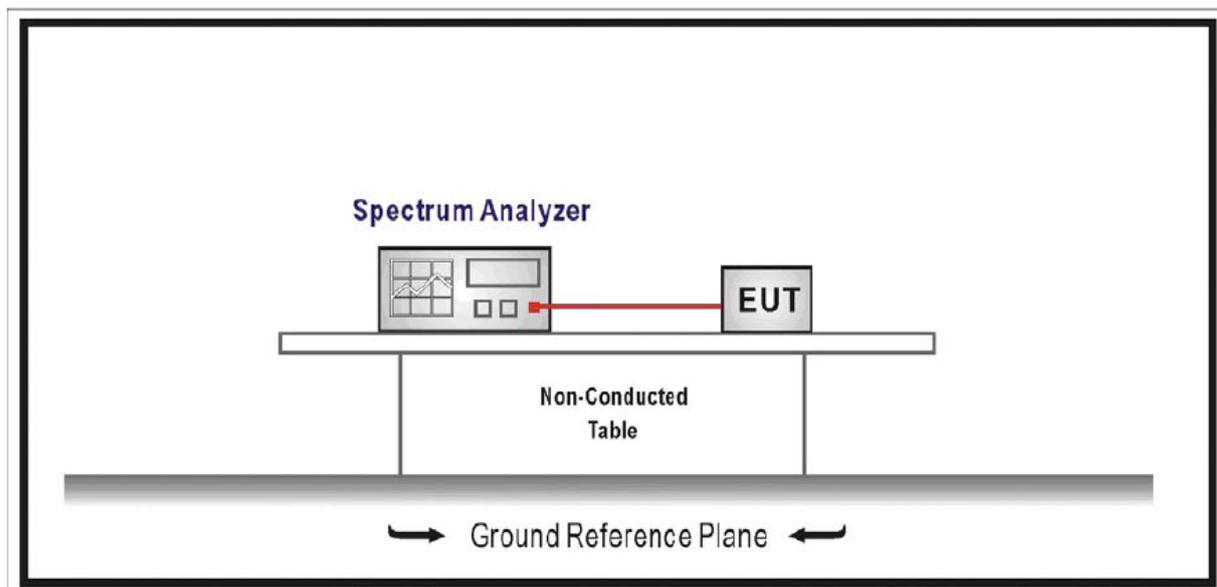
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		89.866	43.630	33.989	-24.320	67.950	9.641	PK
2	*	89.900	41.651	32.000	-6.299	47.950	9.651	AV

6. 26dB Occupied Bandwidth

6.1. Test Specification

According to EMC Standard: FCC Part 15 Subpart C 15.239, ANSI C63.4

6.2. Test Setup



6.3. Limit

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency, The 200 kHz band shall lie wholly within the frequency range of 88-108MHz.

6.4. Test Procedure

Set RBW = 10 kHz, VBW = 30 kHz, Span greater than 200 kHz.

6.5. Deviation from Test Standard

No deviation.

6.6. Test Result

Not performed.