

FCC PART 15.323
EMI MEASUREMENT AND TEST REPORT

For

American Telecom Services, Inc.

2466, Peck Road, City of Industry, CA 90601, U.S.A

FCC ID: UGX-X10002X

October 8, 2006

This Report Concerns: ☒ Original Report	Equipment Type: 1.9GHZ CORDLESS VOIP PHONE
Test Engineer: Merry Zhao <i>Merry Zhao</i>	
Report No.: RSH06082202	
Test Date: August 31, 2006-October 8, 2006	
Reviewed By: EMC Manager: Boni Baniqued <i>Boni Baniqued</i>	
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approval, or endorsement by NVLAP, NIST or any agency of the US Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *American Telecom Services, Inc.* 's product, model: *Extension = X10002X* where the *X* at the end (far right) will change based on who the service provider is that is supported by the phone or the "EUT" as referred to in this report is a transmitter of 1.9G CORDLESS VOIP PHONE which measures approximately 12.5 cm L x 4.8 cm W x 2.3 cm H, rated input voltage: DC 3.6 V battery.

** The test data gathered are from production sample, serial number: 0608035, provided by the manufacturer, we receive the EUT on 2006-8-22.*

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.17 - 1998.

The tests were performed in order to determine compliance with FCC Part 15, Subpart D, and section 15.203, 15.315, 15.317, 15.319 and 15.323 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.17 - 1998, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.17 - 1998.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

N/A.

Special Accessories

N/A.

Equipment Modifications

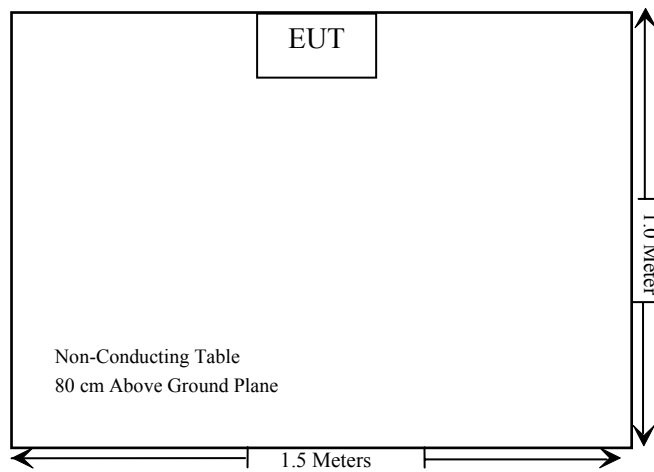
Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

RULES	DESCRIPTION OF TEST	RESULT
§ 15.317 § 15.203	Antenna Requirement	Compliant
§ 15.315 § 15.207	Conducted Emission	Compliant*
§ 15.319 (g)	Radiated Emission	Compliant*
§ 15.319 (i)	RF Radiation Exposure	Please refer to the SAR report
§ 15.323 (a)	Emission Bandwidth	Compliant
§ 15.319 (c)	Peak Transmit Power	Compliant
§ 15.319 (d)	Power Spectral Density	Compliant
§ 15.323 (d)	Emission Inside and Outside the sub-band	Compliant
§ 15.323 (f)	Frequency Stability Base	Compliant
§ 15.323 (c)(e) § 15.319 (f)	Verification of Access Protocols	Compliant

* Within measurement uncertainty.

§15.317&15.203 - ANTENNA REQUIREMENT

Standard Applicable

§15.317, an unlicensed PCS device must meet the antenna requirement of §15.203.

§15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has an integrated antenna arrangement, fulfill the requirement of this section.

Test Result: Pass

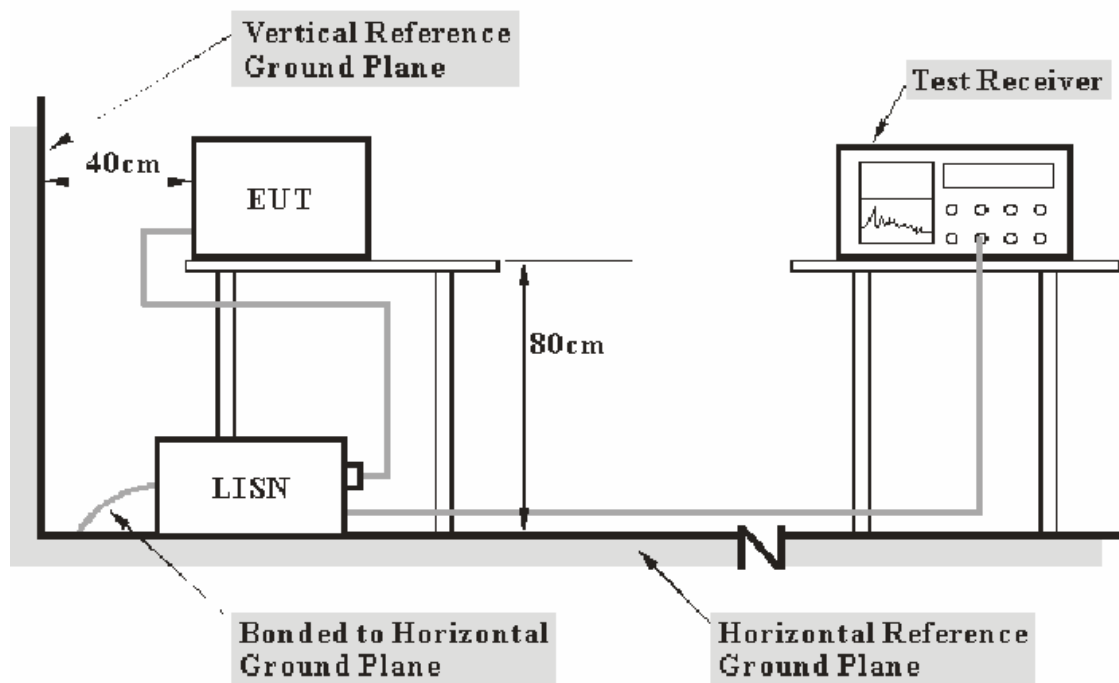
§15.315&15.207 - CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ± 2.4 dB.

EUT Setup



- Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.17 - 1998 measurement procedure. The specification used was with the FCC Part 15.207 limits.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>IFBW</i>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12008	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2006-3-1	2007-3-1

* Com-Power's LISN were used as the supporting equipment.

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

-2.31 dB at 0.210 MHz in the Live conductor mode.

Test Data**Environmental Conditions**

Temperature:	25 ° C
Relative Humidity:	55%
ATM Pressure:	1000mbar

The testing was performed by Merry Zhao on 2006-8-31.

Test Mode: Charging

Frequency MHz	AC LINE CONDUCTED EMISSIONS			FCC PART 15.207	
	Amplitude dBμV	Detector QP/AV	Phase Live/Neutral	Limit dBμV	Margin dB
0.210	60.90	QP	Live	63.21	-2.31*
0.210	59.70	QP	Neutral	63.21	-3.51
0.210	46.50	AV	Live	53.21	-6.71
0.210	45.70	AV	Neutral	53.21	-7.51
0.430	45.20	QP	Live	57.25	-12.05
0.430	43.60	QP	Neutral	57.25	-13.65
0.870	41.50	QP	Live	56.00	-14.50
1.990	41.30	QP	Neutral	56.00	-14.70
1.930	41.00	QP	Live	56.00	-15.00
0.870	40.40	QP	Neutral	56.00	-15.60
2.770	40.30	QP	Live	56.00	-15.70
2.890	39.50	QP	Neutral	56.00	-16.50
0.430	29.90	AV	Live	47.25	-17.35
0.610	35.40	QP	Live	56.00	-20.60
0.430	26.40	AV	Neutral	47.25	-20.85
0.630	34.70	QP	Neutral	56.00	-21.30
0.870	22.40	AV	Neutral	46.00	-23.60
0.610	22.30	AV	Live	46.00	-23.70
0.870	21.10	AV	Live	46.00	-24.90
0.630	19.30	AV	Neutral	46.00	-26.70
1.990	17.70	AV	Neutral	46.00	-28.30
2.770	17.10	AV	Live	46.00	-28.90
2.890	16.60	AV	Neutral	46.00	-29.40
1.930	14.40	AV	Live	46.00	-31.60

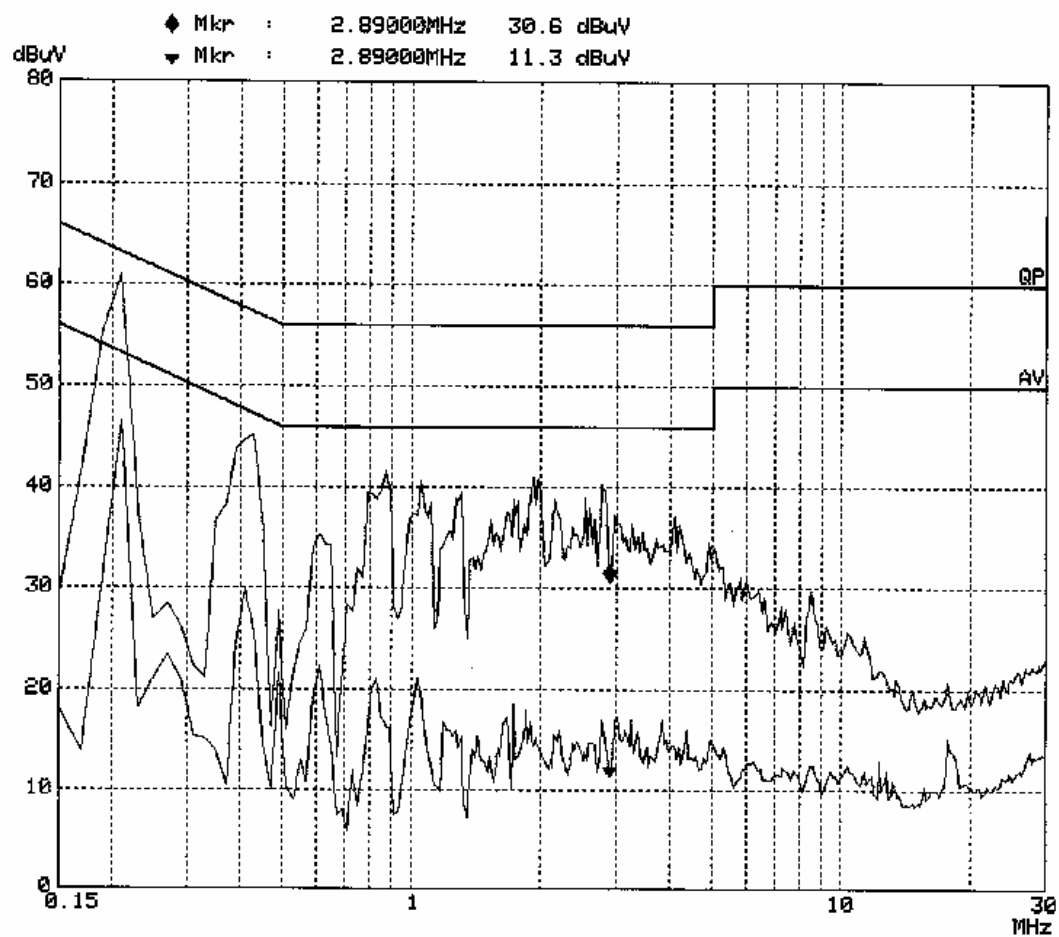
* Within measurement uncertainty.

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

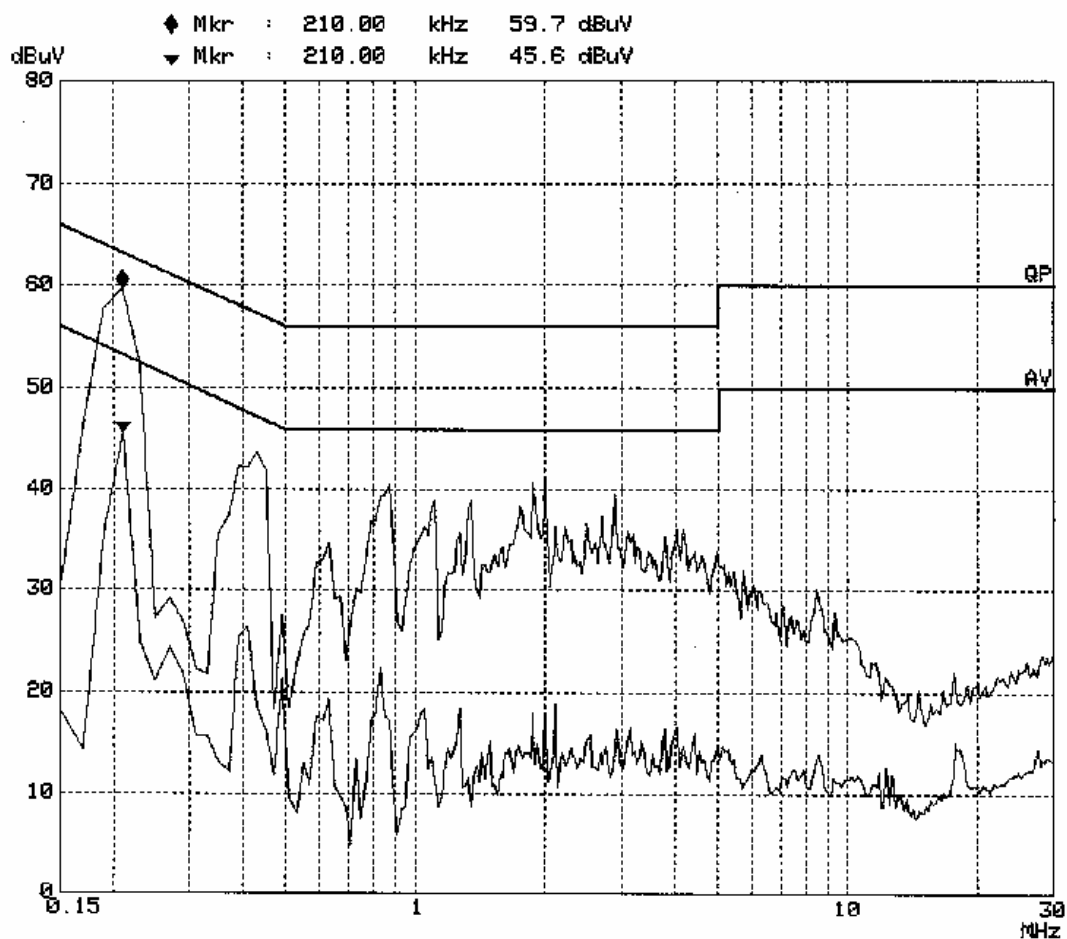
CONDUCTION EMISSION FCC Part 15

EUT: 1.9G Cordless VOIP Phone, M/N: X1002X
Manuf: American Telecom
Op Cond: Charging
Operator: Merry
Test Spec: AC 120V/60Hz L
Comment: Temp: 25 Humi: 55%
Date: 31. Aug 06 10:06



CONDUCTION EMISSION FCC Part 15

EUT: 1.9G Cordless VOIP Phone,M/N:X1002X
Manuf: American Telecom
Op Cond: Charging
Operator: Merry
Test Spec: AC 120V/60Hz N
Comment: Temp:25 Humi:55%
Date: 31. Aug 06 09:35



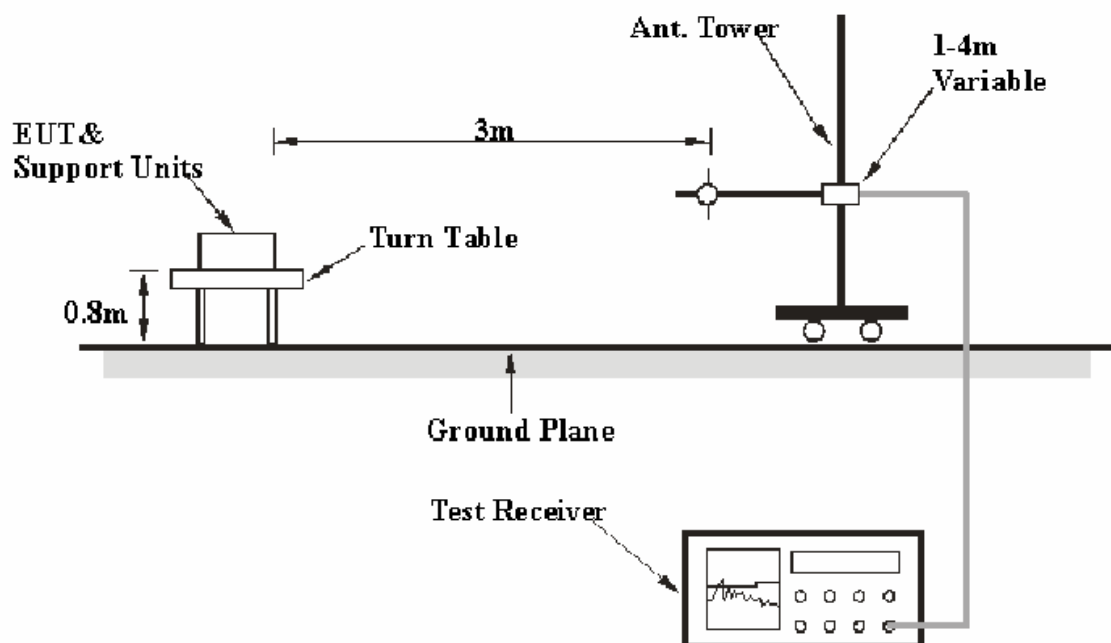
§15.319 (g) - RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber A&B test site, using the setup accordance with the ANSI C63.17 - 1998. The specification used was the FCC 15 § 15.319(g).

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

During the radiated emission test, the test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>VBW</i>
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 5 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2005-12-8	2006-12-8
HP	Amplifier	8449B	3008A00277	2006-8-17	2007-8-17
Sunol Sciences	Horn Antenna	DRH-118	A052604	2006-7-20	2007-7-20
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26
HP	Amplifier	HP8447E	1937A01046	2006-8-17	2007-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2006-4-28	2007-4-28

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Peak and Average detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -5.8dB means the emission is 5.8dB below the limit for Class C. The equation for margin calculation is as follows:

$$\begin{aligned}\text{Margin} &= \text{Corr. Ampl.} - \text{Limit} \\ \text{Margin} &= \text{Limit} - \text{Corr. Ampl.}\end{aligned}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.319 (g), with the worst margin reading of:

Charging Mode:

-1.8 dB at 152.065075 MHz in the Vertical polarization.

Transmitting Mode:

30MHz-1000MHz:

High Channel: 3.9 dB at 152.073950 MHz in the Vertical polarization.

Low Channel: 9.3 dB at 907.770575 MHz in the Vertical polarization.

Above 1GHz:

High Channel: -18.68 dB at 3856.896 MHz in the Horizontal polarization.

Low Channel: -6.63 dB at 5764.608 MHz in the Vertical polarization.

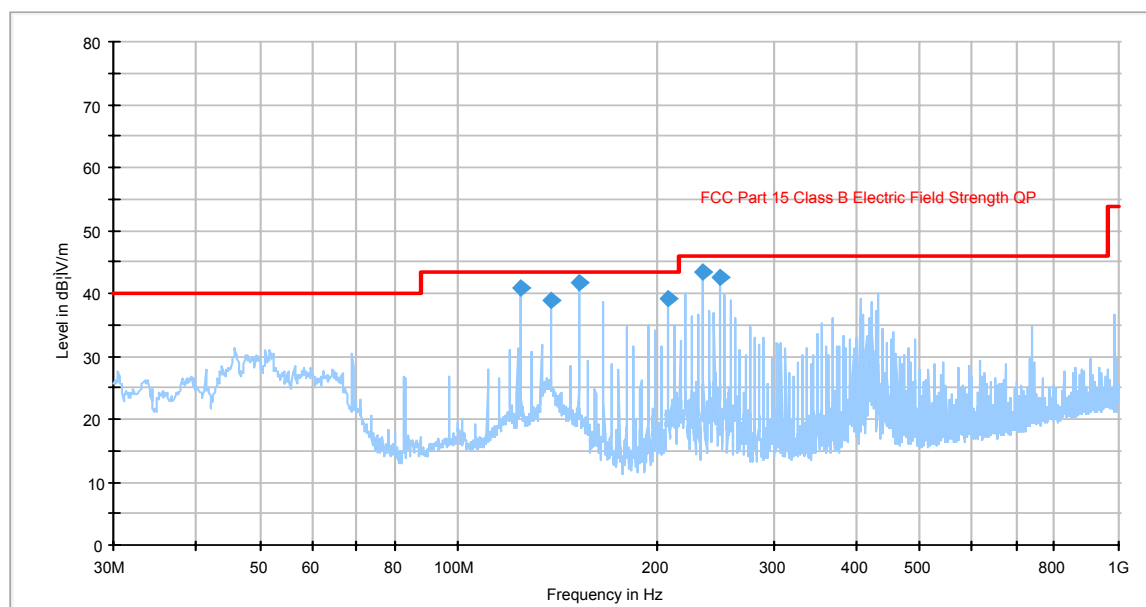
Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	1002mbar

The testing was performed by Merry Zhao on 2006-8-31.

Test Mode: Charging



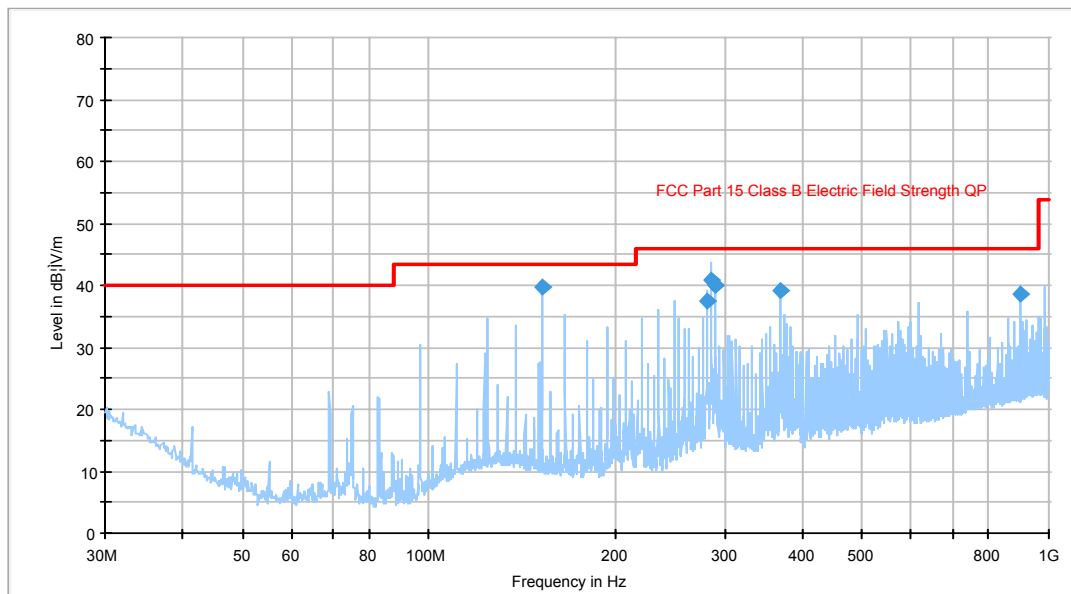
Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
124.406125	40.9	101.0	V	289.0	-13.1	2.6*	43.5
152.065075	41.7	102.0	V	67.0	-14.2	1.8*	43.5
235.005250	43.3	233.0	V	334.0	-14.1	2.7*	46.0
248.836100	42.4	198.0	V	3.0	-13.9	3.6*	46.0
207.358925	39.2	101.0	V	247.0	-14.2	4.3	43.5
138.238775	38.7	102.0	V	316.0	-13.2	4.8	43.5

* Within measurement uncertainty.

Test Mode: Transmitting

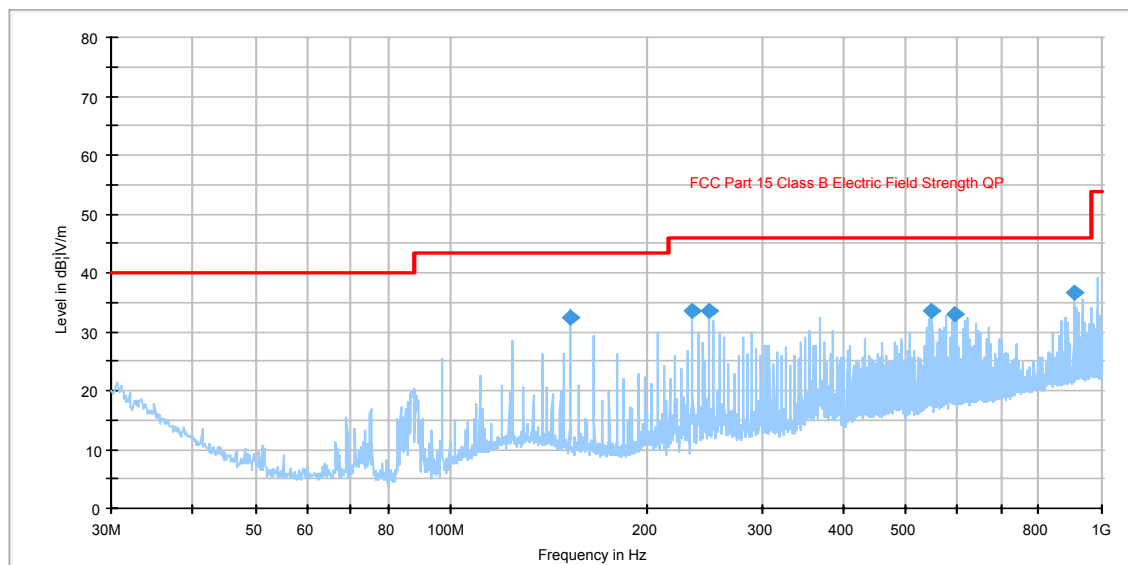
30MHz-1000MHz

High Channel



Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
152.073950	39.6	99.0	V	189.0	-14.2	3.9*	43.5
285.697875	40.9	121.0	V	146.0	-11.9	5.1	46.0
290.306575	40.1	116.0	V	156.0	-11.9	5.9	46.0
368.628900	39.2	100.0	V	176.0	-9.6	6.8	46.0
897.473000	38.5	117.0	V	340.0	-2.7	7.5	46.0
281.095700	37.6	116.0	V	153.0	-11.9	8.4	46.0

* Within measurement uncertainty.

Low Channel

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
907.770575	36.7	116.0	V	159.0	-2.3	9.3	46.0
152.059025	32.3	99.0	V	297.0	-14.2	11.2	43.5
235.012525	33.6	100.0	V	315.0	-14.1	12.4	46.0
548.354850	33.6	113.0	V	9.0	-7.7	12.4	46.0
248.829550	33.4	100.0	V	324.0	-13.9	12.6	46.0
594.432250	32.9	100.0	V	296.0	-6.9	13.1	46.0

Above 1GHz

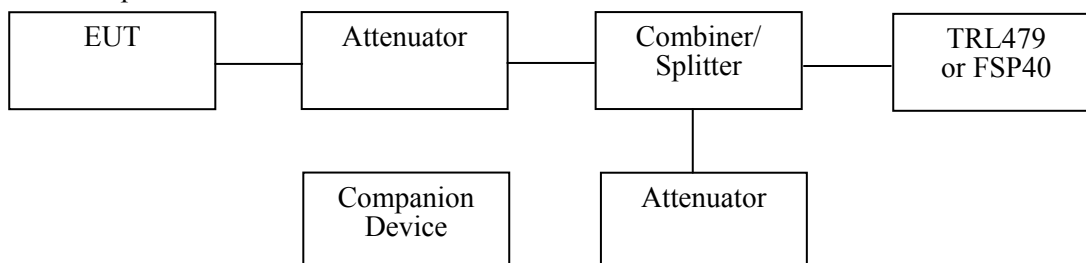
Frequency MHz	Meter Reading dBuV/m	Detector PK/QP/AV	Direction Degree	Height Meter	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier Gain dB	Corr. Ampl. dBuV/m	FCC Part 15.319(g)		
										Limit dBuV/m	Margin dB	
High Channel												
3856.896	52.83	PK	45	1.0	H	31.2	3.79	32.5	55.32	74	-18.68	Harmonic
3856.896	32.00	AV	60	1.0	H	31.2	3.79	32.5	34.49	54	-19.51	Harmonic
5785.344	51.00	PK	90	1.2	V	32.4	4.70	34.4	53.70	74	-20.30	Harmonic
5785.344	50.17	PK	45	1.2	H	32.4	4.70	34.4	52.87	74	-21.13	Harmonic
5785.344	30.17	AV	180	1.2	H	32.4	4.70	34.4	32.87	54	-21.13	Harmonic
5785.344	30.00	AV	180	1.2	V	32.4	4.70	34.4	32.70	54	-21.30	Harmonic
3856.896	30.00	AV	45	1.2	V	31.2	3.79	32.5	32.49	54	-21.51	Harmonic
3856.896	47.67	PK	270	1.0	V	31.2	3.79	32.5	50.16	74	-23.84	Harmonic
1928.448	74.83	PK	45	1.0	H	27.4	3.09	0	105.32			Fundamental
1928.448	21.67	AV	180	1.2	H	27.4	3.09	0	52.16			Fundamental
1928.448	81.67	PK	45	1.0	V	27.4	3.09	0	112.16			Fundamental
1928.448	22.50	AV	60	1.2	V	27.4	3.09	0	52.99			Fundamental
Low Channel												
5764.608	64.67	PK	90	1.2	V	32.4	4.70	34.4	67.37	74	-6.63	Harmonic
3843.072	63.00	PK	270	1.0	V	31.2	3.79	32.5	65.49	74	-8.51	Harmonic
5764.608	34.67	AV	180	1.2	V	32.4	4.70	34.4	37.37	54	-16.63	Harmonic
3843.072	54.83	PK	45	1.0	H	31.2	3.79	32.5	57.32	74	-16.68	Harmonic
3843.072	34.50	AV	60	1.0	H	31.2	3.79	32.5	36.99	54	-17.01	Harmonic
5764.608	34.17	AV	180	1.2	H	32.4	4.70	34.4	36.87	54	-17.13	Harmonic
3843.072	33.67	AV	45	1.2	V	31.2	3.79	32.5	36.16	54	-17.84	Harmonic
5764.608	50.50	PK	45	1.2	H	32.4	4.70	34.4	53.20	74	-20.80	Harmonic
1921.536	76.33	PK	45	1.0	H	27.4	3.09	0	106.82			Fundamental
1921.536	33.17	AV	180	1.2	H	27.4	3.09	0	63.66			Fundamental
1921.536	85.67	PK	45	1.0	V	27.4	3.09	0	116.16			Fundamental
1921.536	37.17	AV	60	1.2	V	27.4	3.09	0	67.66			Fundamental

§15.323 (a) - EMISSION BANDWIDTH

Standard Applicable

The emission bandwidth is measured in accordance with ANSI C63.17 sub-clause 6.1.3 using the setup below

Test Setup 1:



The width, in Hz, of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that is 26 dB down relative to the maximum level of the modulated carrier. It is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1% of the emission band-width of the device under measurement. [Extraction from 47 VFR 15, subpart D, 15.303 (C)].

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2006-8-31.

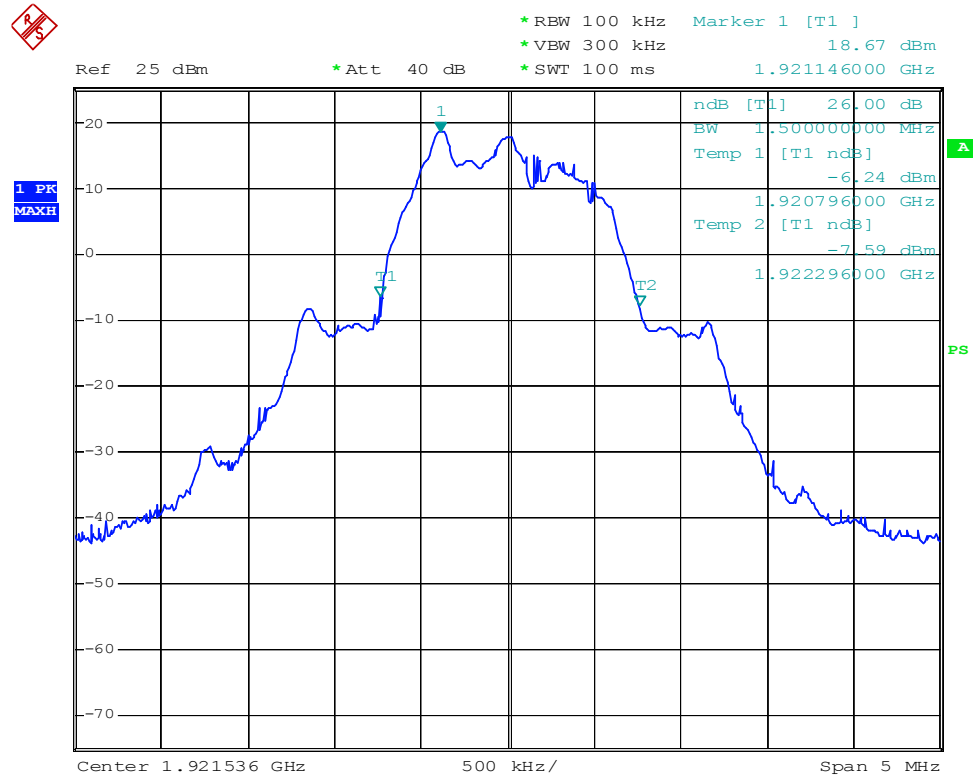
Test Mode: Operating

Channel	Center frequency (MHz)	26dB bandwidth (MHz)	Limit
Low Channel	1921.536	1.50	50kHz<BW<2.5MHz
Middle Channel	1924.992	1.49	50kHz<BW<2.5MHz
High Channel	1928.448	1.49	50kHz<BW<2.5MHz

Test Result: Pass

Refer to the attached plots.

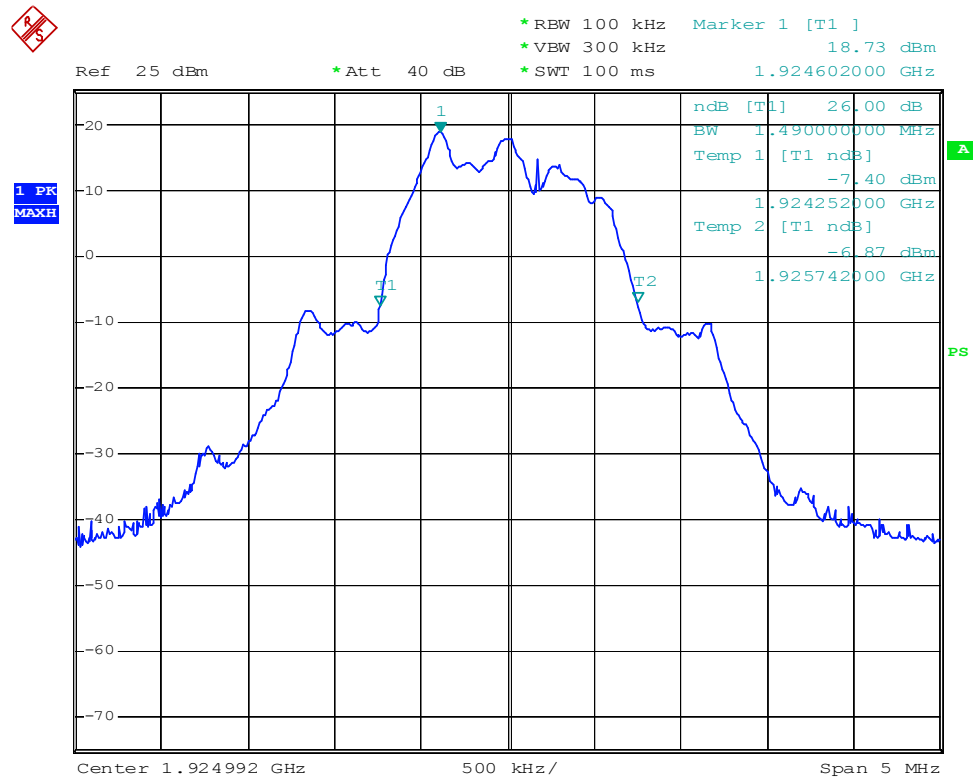
Low channel



American Telecom Extension X1002 26dB bandwidth low channel

Date: 31.AUG.2006 18:22:46

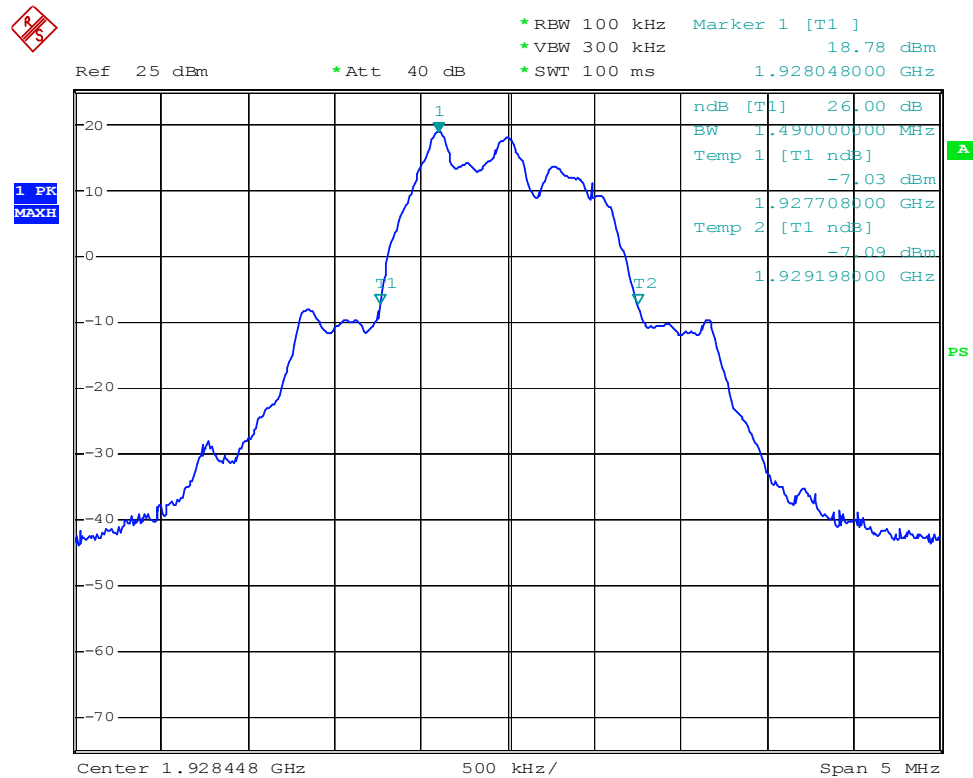
Middle channel



American Telecom Extension X1002 26dB bandwidth middle channel

Date: 31.AUG.2006 18:20:46

High channel



American Telecom Extension X1002 26dB bandwidth high channel

Date: 31.AUG.2006 18:14:05

§15.319 (c) - PEAK TRANSMIT POWER

Standard Applicable

The peak power output as measured over an interval of time equal to the transmission-burst duration of the device under all conditions of modulation. [47 CFR 15, subpart D, 15.303 (f)].

Part 15.323(a) & Part 15.319(c) Peak Transmit Power:

The limit for Peak Transmit Power (PTP) is calculated using the following formula:

$$PTP = 100 \mu W \times (EBW)^{1/2}$$

EBW is the transmit emission bandwidth in Hz determined in the other test item:

$$EBW = 1500000 \text{ Hz}$$

$$PTP = 100 \mu W \times (1500000)^{1/2}$$

$$PTP = 20.88 \text{ dBm}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2006-8-31.

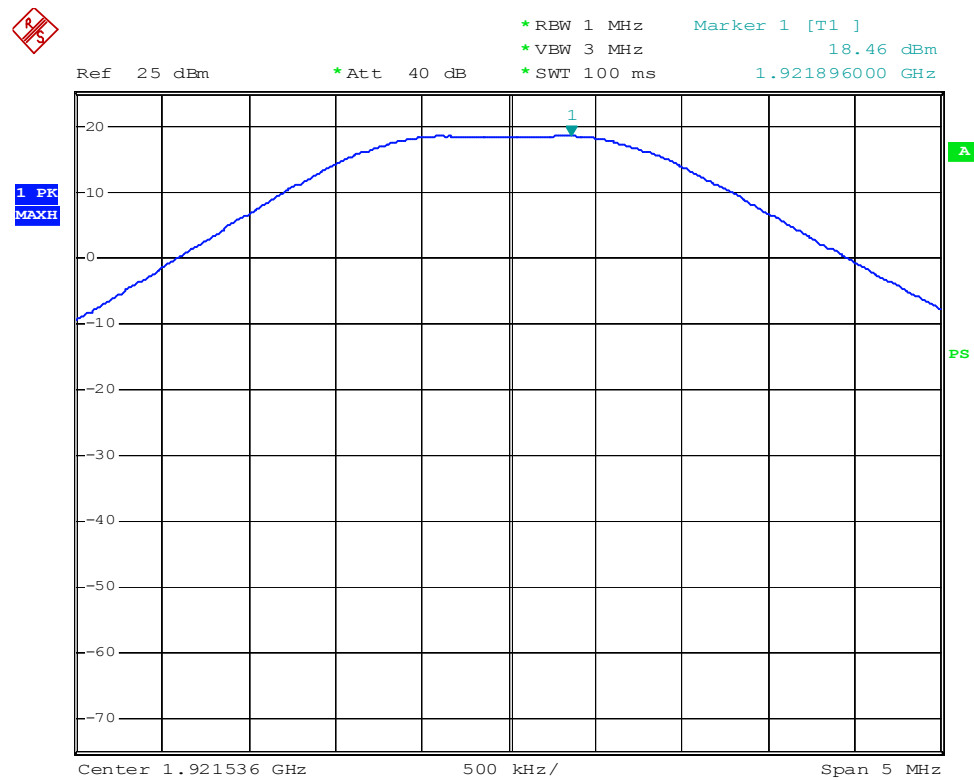
Test Mode: Operating

Test Result: Pass

Frequency (MHz)	Peak Transmit Power (dBm)	Limit (dBm)
1921.536	18.46	20.88
1924.992	18.52	20.88
1928.448	18.56	20.88

Refer to the attached plots.

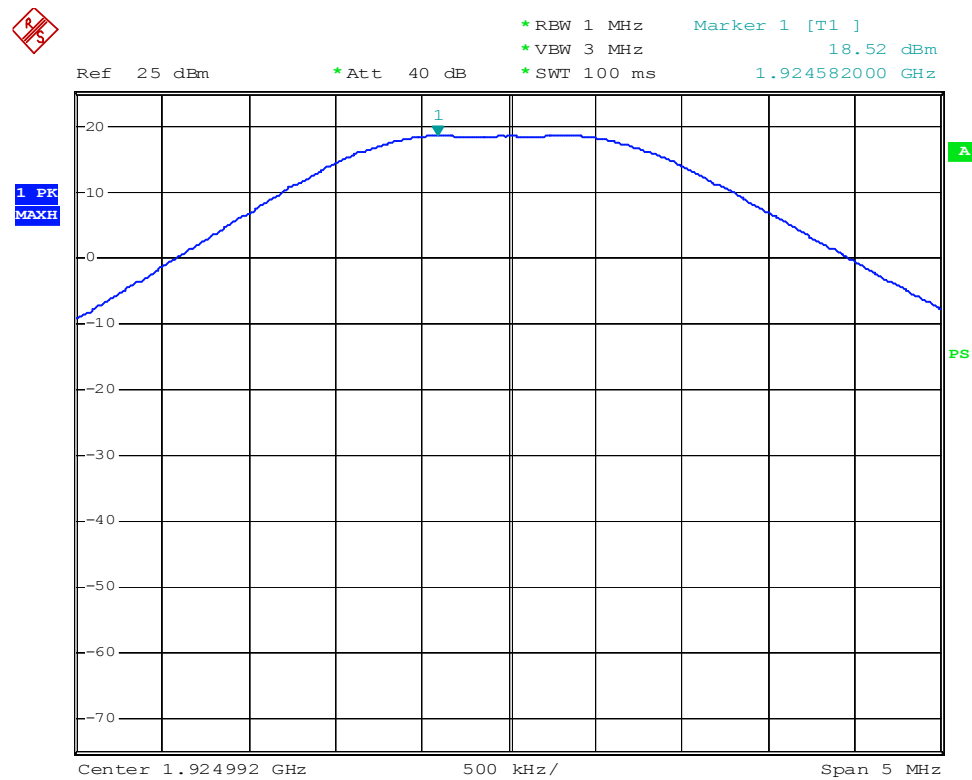
Low channel



American Telecom Extension X1002 peak transmit powr low chan
nel

Date: 31.AUG.2006 18:26:07

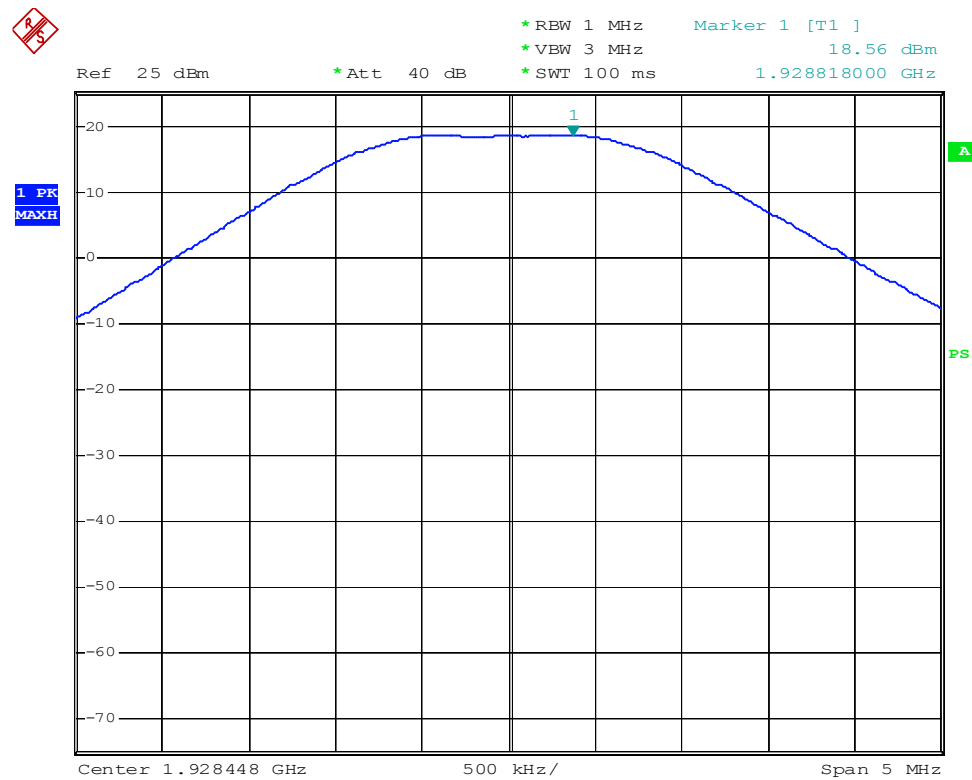
Middle channel:



American Telecom Extension X1002 output peak power middle ch
annel

Date: 31.AUG.2006 18:18:58

High channel:



American Telecom Extension X1002 peak transmit power high ch
annel

Date: 31.AUG.2006 18:11:04

§15.319 (d) - POWER SPECTRAL DENSITY

Standard Applicable

The average pulse energy in a 3 kHz bandwidth divided by the pulse duration.

The power spectral density shall not exceed 3mW in any 3kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2006-8-31, 2006-10-8.

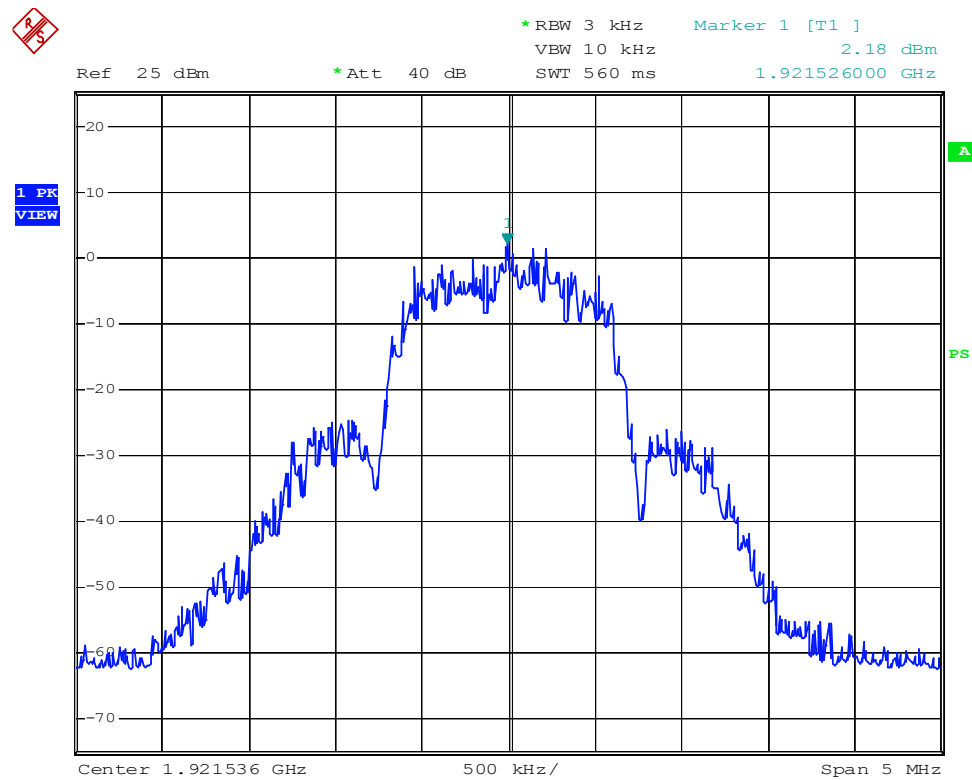
Test Mode: Operating

Test Result: Pass

Frequency (MHz)	Power Spectral Density		Limit (mW/3kHz)	Result
	dBm/3kHz	mW/3kHz		
1921.536	2.18	1.65	3	Pass
1924.992	2.86	1.93	3	Pass
1928.448	0.71	1.18	3	Pass

Refer to the attached plots.

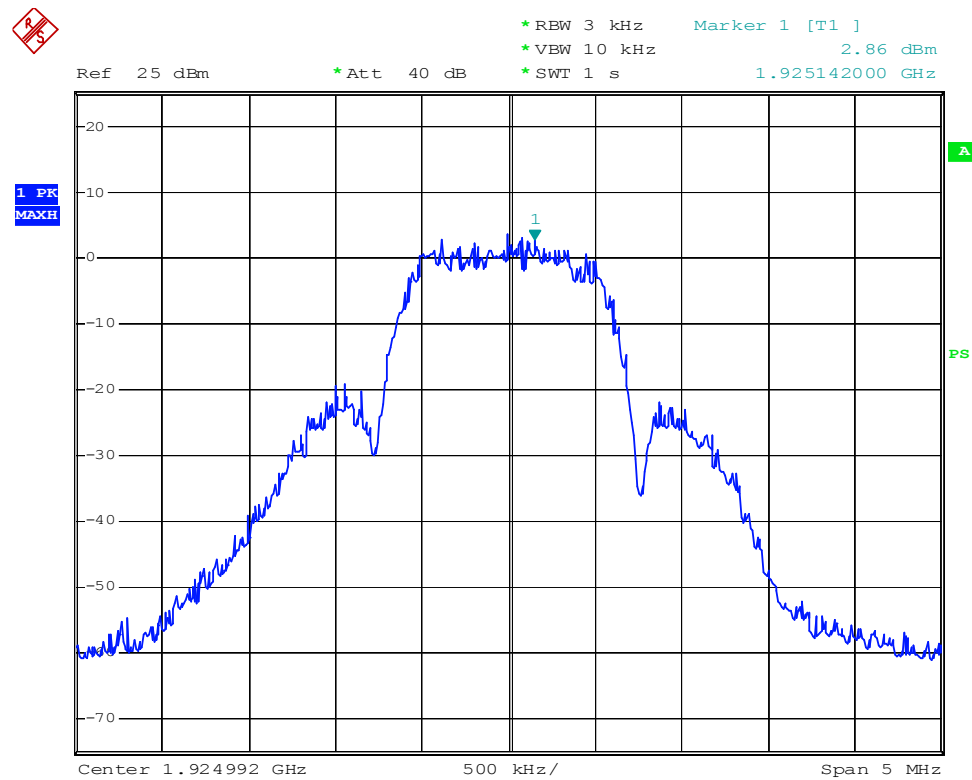
Low channel



America Telecom extension X1002 power spectral density low
channel

Date: 8.OCT.2006 13:23:06

Middle channel

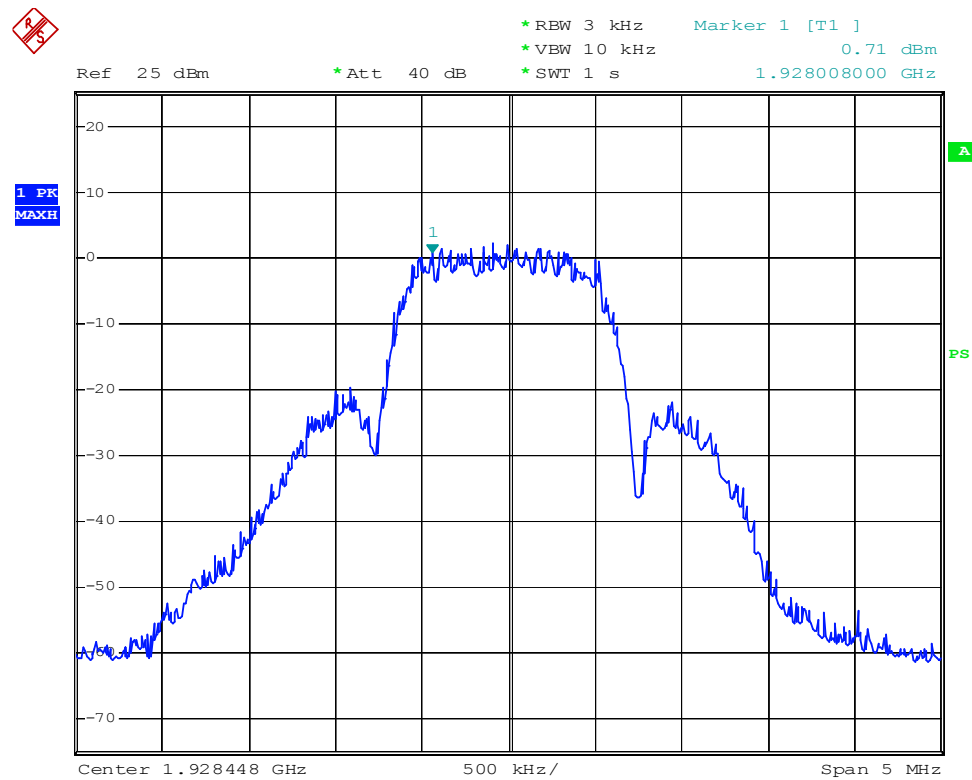


American Telecom Extension X1002 powr spectral density midd

le channel

Date: 31.AUG.2006 18:33:37

High channel



American Telecom Extension X1002 powr spectral density high
channel

Date: 31.AUG.2006 18:36:49

§15.323 (d) - EMISSION INSIDE AND OUTSIDE THE SUB-BAND

Standard Applicable

The spectrum allocated for isochronous or asynchronous transmission. [47 CFR 15, Subpart D, 15.303(i)]

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330 or 830245/006	2006-1-26	2007-1-26

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data**Environmental Conditions**

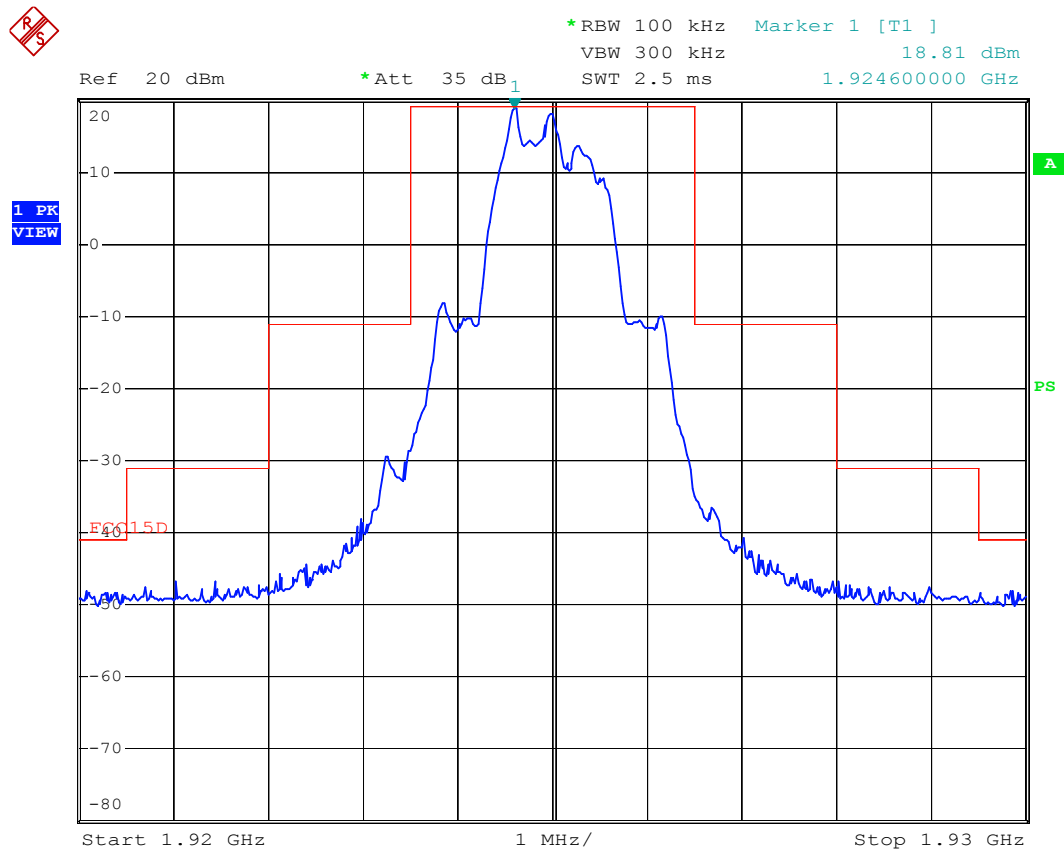
Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2006-9-1.

Test Mode: Operating

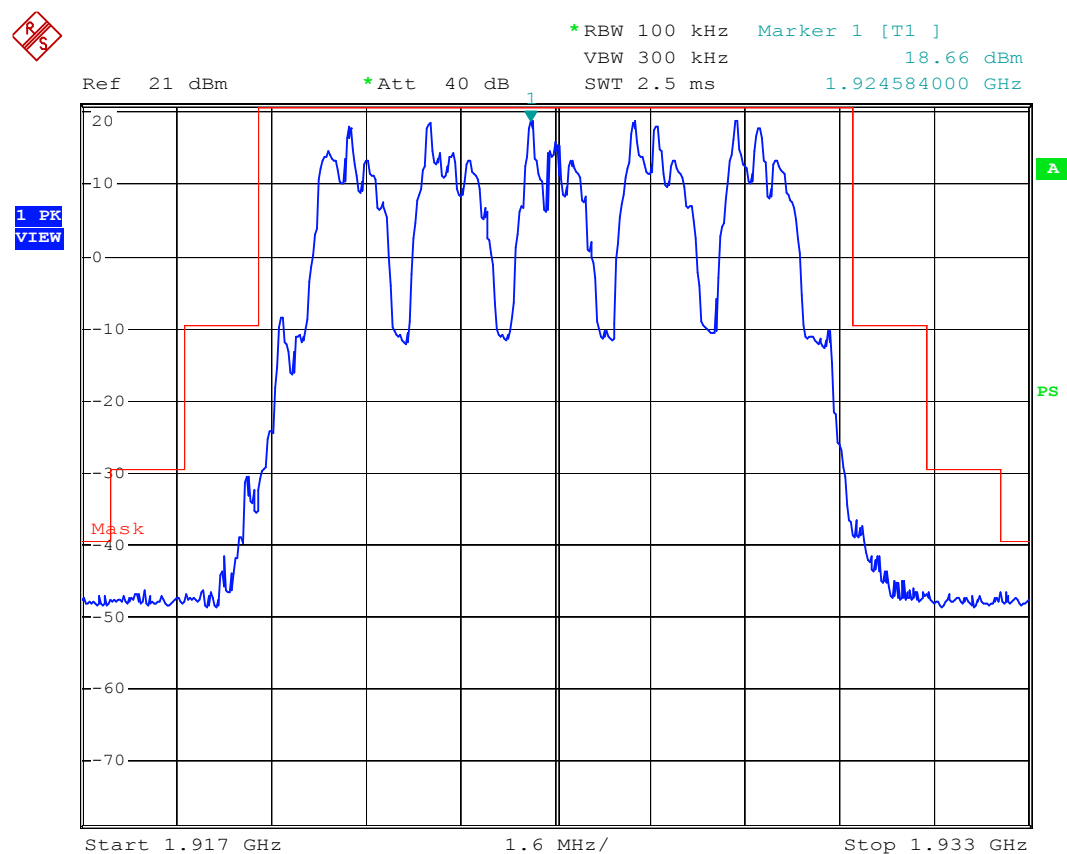
Test Result: Pass

Refer to the attached plots.



Emission mask inside the sub-band handset

Date: 1.SEP.2006 15:25:19



Emission mask outside the sub-band handset

Date: 1.SEP.2006 15:31:58

§15.323 (f) - FREQUENCY STABILITY

Standard Applicable

This procedure should be carried out for each of the following test cases:

Temperature	Supply Voltage
20°C	85-115% or new batteries
-20°C ^a	Normal
+50°C	Normal

^a Use the lowest temperature at which the EUT is specified to operate if it is above -20 °C.

Using the mean carrier frequency at 20°C and at nominal supply voltage as the reference, the mean carrier frequency shall be maintained within ± 10 ppm at the two extreme temperatures (or as declared by the manufacturer) and at normal temperature (typically 20°C) at the two extreme supply voltages.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
WUHUAN	Temperature & Humidity Chamber	HTP205	20021115	2006-1-2	2007-1-2
Rohde & Schwarz	Digital Radio Tester	CTS60	1005.7	2006-3-5	2007-3-5

* **Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2006-8-31.

Test Mode: Operating

Test Result: Pass

Temperature (°C)	Voltage (Vdc)	Channel Frequency (MHz)	Offset (kHz)	Offset (ppm)	Limit (ppm)
20	Normal (3.6)	1924.992	+2.926	+ 1.52	± 10
	New battery	1924.992	2.887	+1.50	± 10
-20	Normal (3.6)	1924.992	9.991	+5.19	± 10
	New battery	1924.992	9.991	+5.19	± 10
+50	Normal (3.6)	1924.992	5.005	+2.60	± 10
	New battery	1924.992	5.063	+2.63	± 10

§15.323 (c) (e) & §15.319(f)-VERIFICATION OF ACCESS PROTOCOLS**Part 15.319(f)**

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. The provisions in this section are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Result:

Part	Transmits Control and Signaling Information	Equipment Under Test
Base	X	
Handset		X

Number	Test	Reaction of EUT	Pass/Fail
1	Power removed from EUT	C	Pass
2	EUT powered down	C	Pass
3	Battery charger connected to PCB	C	Pass
4	Power/Signal cable removed counter part	A	Pass
5	Power removed from Base part	A	Pass
6	Base part powered down	A	Pass

A – Connection breakdown, Cease of all transmissions.

B – Connection breakdown, EUT transmits control and signalling information.

C – Connection breakdown, Counterpart transmits control and signalling information.

Part 15.323 (c) (2); (c)(9)

(c)(2) The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth used by the device.

(c)(9) Devices that have a power output lower than the maximum permitted under this subpart may increase their monitoring detection threshold by one decibel for each one decibel that the transmitter power is below the maximum permitted.

Calculation of monitoring threshold limits for isochroous devices:

Low threshold: $T_L = -174 + 10\log_{10}B + M_u + P_{MAX} - P_{EUT}(\text{dBm})$

Upper threshold: $T_U = -174 + 10\log_{10}B + M_u + P_{MAX} - P_{EUT}(\text{dBm})$

Where: B=Emission bandwidth(Hz)
 M_u =dBs the threshold may exceed thermal noise (30 for T_L & 50 for T_U)
 P_{MAX} =Output Power Limit(dBm)
 P_{EUT} =Transmitted power(dBm)

BASE:

Monitor Threshold	B (MHz)	M_u (dB)	P_{MAX} (dBm)	P_{EUT} (dBm)	Threshold (dBm)
T_L	1.50	30	20.88	18.56	-79.92
T_U	1.50	50	20.88	18.56	-59.92

Note: 1.The upper threshold(T_U) is only applicable for systems with a minimum of 40 channels.

Limits

The EUT must not transmit until the interference level is less than or equal to:

Measured Threshold Level $\leq T_L + U_M$

Where: T_L =Lower threshold level
 U_M =Margin of uncertainty in threshold measurements (6dB)

Results

Monitor threshold	Measured Threshold Level	Limit(dBm)
Lower Threshold (dBm)	-75.0	-73.92
Upper Threshold (dBm)	N/A	N/A

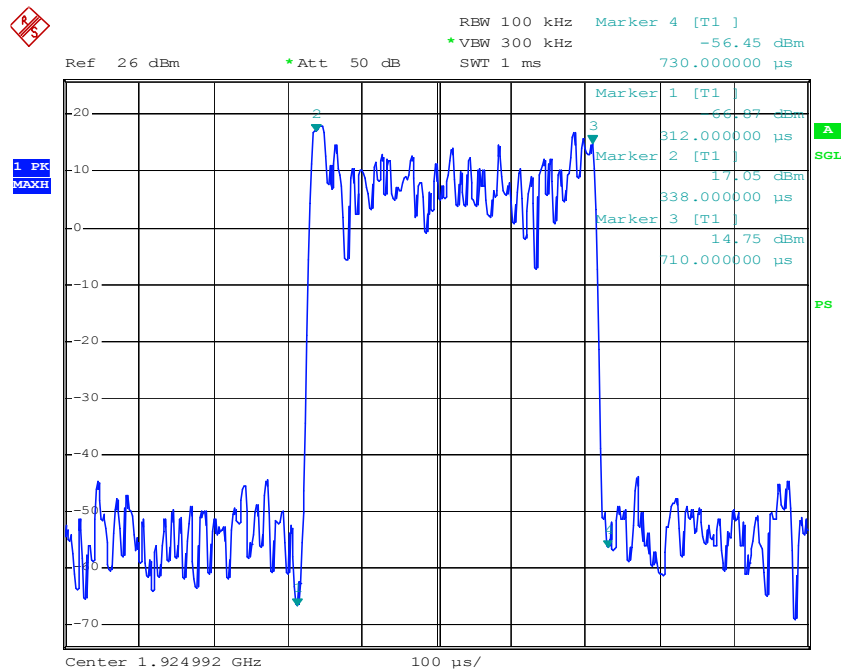
Part 15.323 (c) (3) Duration of the transmission

Result:

Repetition of Access Criteria	Maximum Transmission Time	Maximum Transmission Time
First	<4.0	< 8 hours
Second	<4.0	< 8 hours

Part 15.323 (c) (4) System Acknowledgment time

Test	Time taken (second)	Limit (second)	Result
Initiating transmitter time	0.000026	1	Pass
Channel used for control and signaling information	0.000372	30	Pass
Transmission cease time	0.000020	30	Pass



Date: 2.SEP.2006 17:21:26

Part 15.323 (c) (5) - At less 40 duplex channels and access the defined channel time

Result:

Least interfered Channel

As this system has less than 40 channels the least interfered channel relating to the lower monitoring threshold shall be assessed. This test was carried out in accordance with ANSI C63.17 sub-clause 7.3.3 using test setup 2. The EUT was frequency administered to operating on two frequencies only, f1 and f2.

f1 = 1924.992 MHz

f2 = 1923.264 MHz

Test b)

Interference on f1 was set at TL + UM + 7dB and at TL + UM on f2. Initiate communication. The EUT should transmit on f2. Repeat 5 times. If the EUT transmits on f1 the test is failed.

Test c)

Interference on f1 was set at TL + UM and at TL + UM + 7dB on f2. Initiate communication. The EUT should transmit on f1. Repeat 5 times. If the EUT transmits on f2 the test is failed.

Test d)

Interference on f1 was set at TL + UM + 1dB and at TL + UM - 6dB on f2. Initiate communication. The EUT should transmit on f2. Repeat 5 times. If the EUT transmits on f1 the test is failed.

Test e)

Interference on f1 was set at TL + UM - 6dB and at TL + UM + 7dB on f2. Initiate communication. The EUT should transmit on f1. Repeat 5 times. If the EUT transmits on f2 the test is failed.

Result:

Test	Transmit on f1	Transmit on f2	Wanted Transmit Channel	Pass/Fail
a	No	Yes	f2	Pass
b	Yes	No	f1	Pass
c	No	Yes	f2	Pass
d	Yes	No	f1	Pass

Note: 1.All tests were repeated 5 times.

Selected Channel Confirmation

This test was carried out in accordance with ANSI C63.17 sub-clause 7.3.4 using test setup 2(page 12).

The test is to ensure the EUT monitors the time/spectrum window immediately prior to transmission.

The EUT was frequency administered to operating on two frequencies only, f1 and f2.

f1 = 1924.992 MHz

f2 = 1923.264 MHz

Test a)

Interference is applied on f1 at a level of TL + UM, verify a connection is established on f2.

The connection is terminated.

Test b)

Interference is applied on f2 at a level of TL + UM and immediately removed from f1 and the EUT is immediately caused to attempt transmission. In this case the EUT should transmit on f1

Result:

Test	Transmit on f1	Transmit on f2	Wanted Transmit Channel	Pass/Fail
a	No	Yes	f2	Pass
b	Yes	No	f1	Pass

Power Accuracy

The power measurement resolution for the previous comparison must be accurate to within 6dB. The monitoring threshold test covered in Part 15.323 (c)(2) automatically proves that this requirement is met.

Segment Occupancy

This section is not applicable as no units will be located within 1 meter of each other.

Part 15.323 (c) (7) The emission bandwidth of the intended transmission and maximum reaction time

Result:

Test Equation (μ s)	B (bandwidth)(MHz)	Pulse width (μ s)	Result (pass/ fail)
$50 (1.25/B)^{1/2}$	1.50	50	Pass
$35 (1.25/B)^{1/2}$	1.12	35	Pass

Part 15.323 (c) (8) Antenna of the monitoring system:

Result:

The antenna of the EUT base and handset used for transmitting is the same interior antenna that is used for monitoring.

Part 15.323 (c) (10) duplex connect:

Result:

The tests laid out in this section verify that the access criteria are met by two devices communicating over a duplex connection. The EUT is the initiating device and the companion is the responding device. These tests are carried out in accordance with ANSI C63.17 sub-clause 8.3.1 using test setup 2. Before all tests are carried out any connection is terminated.

Test b)

The system is restricted to operation on one frequency (1924.992 MHz) using administration. Verify that a connection between the EUT and its companion device can be made.

Test c) & d)

Apply interference at a level TL + UM to all transmit time slots and to all but one receive time slots.

The EUT should not establish a connection.

Test e) & f)

Apply interference at a level TL + UM to all receive time slots and to all but one transmit time slots.

The EUT should not establish a connection.

Result:

Test	Connection Made	Correct Time Slot	Required Slot	Pass/Fail
b	Yes	N/A	Any	Pass
c & d	No	N/A	N/A	Pass
e & f	No	N/A	N/A	Pass

Part 15.323 (c) (11) Alternative monitoring interval for co-located devices:

Result:

This test is carried out in accordance with ANSI C63.17 sub-clause 8.4.

The manufacturer declares that this provision is not utilized by the EUT.

Part 15.323 (c) 12 Fair access to spectrum related to (c) (10)& (c) (11)

Result:

The provisions of (c)(10) & (c)(11) shall not be used to extend the range of spectrum occupied over space or time for the purposes of denying fair access to the spectrum to other devices.

The manufacturer declares that this device does not work in mode, which denies fair access to the spectrum to others.

Part 15.323 (e) Frame Period

Equipment Settings: CMD60

HANDSET:

Frame Repetition Stability:

Frame Repetition Stability (ppm)	Limit (ppm)	Result (Pass/Fail)
0.01	10	Pass

Frame Period and Jitter:

Max.pos.jitter (us)	Max.neg.jitter (us)	Frame period	Limit	
			Frame Period (ms)	Jitter (μs)
0.00	-0.01	10.00001	2or10/X	25us

Part 15.319(e)

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

Result:

Maximum Antenna Gain	Exceeds 3dBi by
0dBi	N/A