

FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

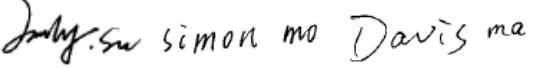
For

Audex Telecom Industrial Co., Ltd.

4/F., Chuangye Center, Kangle Rd., Zhongshan Torch Hi-Tech Industrial Zone, Zhongshan China

FCC ID: P68DSF24811288

December 9, 2005

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Bluetooth Transmitter
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Report No.: RSZ05111603	
Test Date: November 30- December 1, 2005	
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Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of Bay Area Compliance Lab Corp. (ShenZhen). This report **must not** be used by the client to claim product certification, 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 *Audex Telecom Industrial Co., Ltd.*'s product, model number: DSF-2481 or the "EUT" as referred to in this report is a Transmitter, and product name is Telephone Base Station, which measures approximately 12.5 cm L x 10.5cmW x 6.0cmH, rated input voltage: 120 VAC/60 Hz.

Adapter: Manufacturer: Audex Telecom Industrial Co., Ltd.

Model: DU120020D

Input: 120 VAC/ 60 Hz 15W

Output: 12 VDC 200mA

** The test data gathered are from production sample, serial number: Audex-0004 provided by the manufacturer, we receive the EUT on 2005-11-16.*

Objective

This Type approval report is prepared on behalf of *Audex Telecom Industrial Co., Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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 emissions measurement was performed and Bay Area Compliance Lab Corp. (ShenZhen). 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 test 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 C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179 and Industrial Canada registration test site No.: 5500A. 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>

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Kewang	Telephone Exchanger	TC-104L	N/A	DoC
GuoWei	Telephone	HCD1698 (28) TDL B1	N/A	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable Telephone Cable	1.0	EUT	Telephone
Unshielded Detachable Telephone Cable	1.5	RJ11	Telephone Exchanger

SYSTEM TEST CONFIGURATION

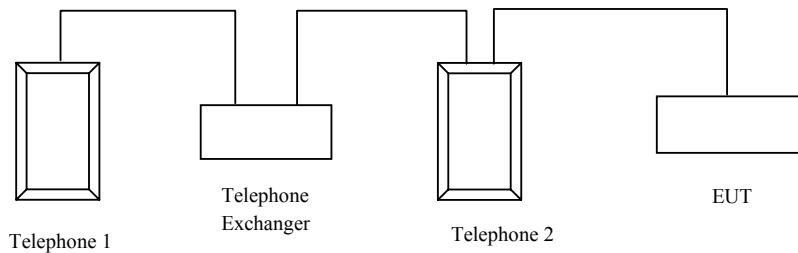
Description of Test Configuration

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

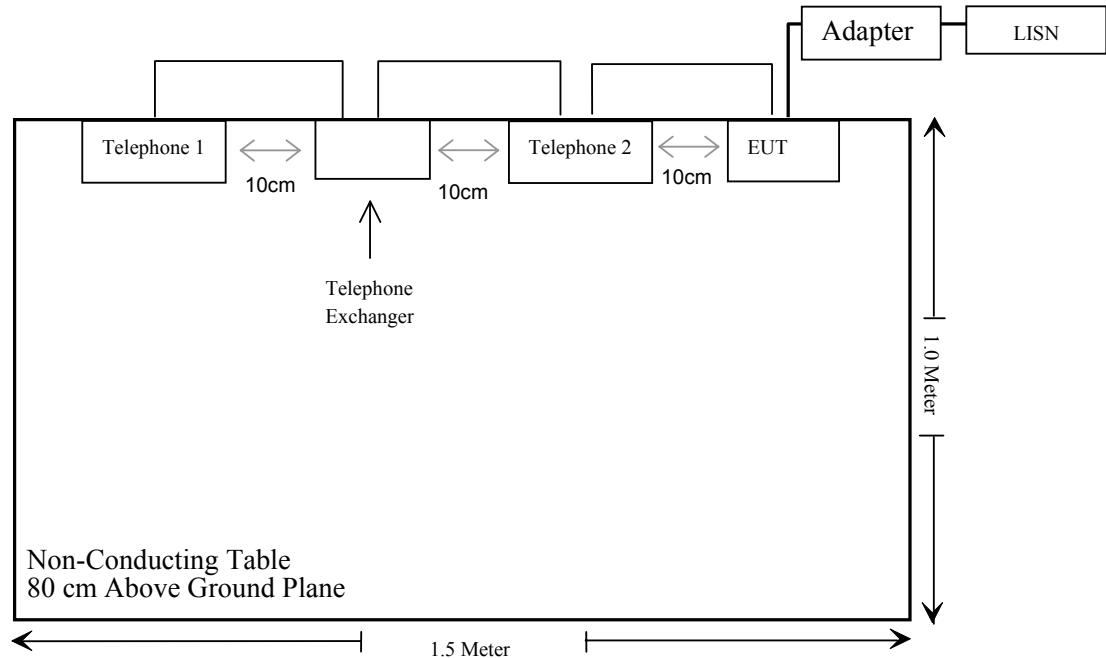
Equipment Modifications

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§15.207 (a)	Conducted Emission	Compliant
§15.205, §15.209, §15.247(d)	Radiated Emission	Compliant *
§15.247 (a)(1)	20 dB Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges testing	Compliant

* Within the measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 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.

And according to § 15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna for this device is an integral antenna with gain of 2 dBi.

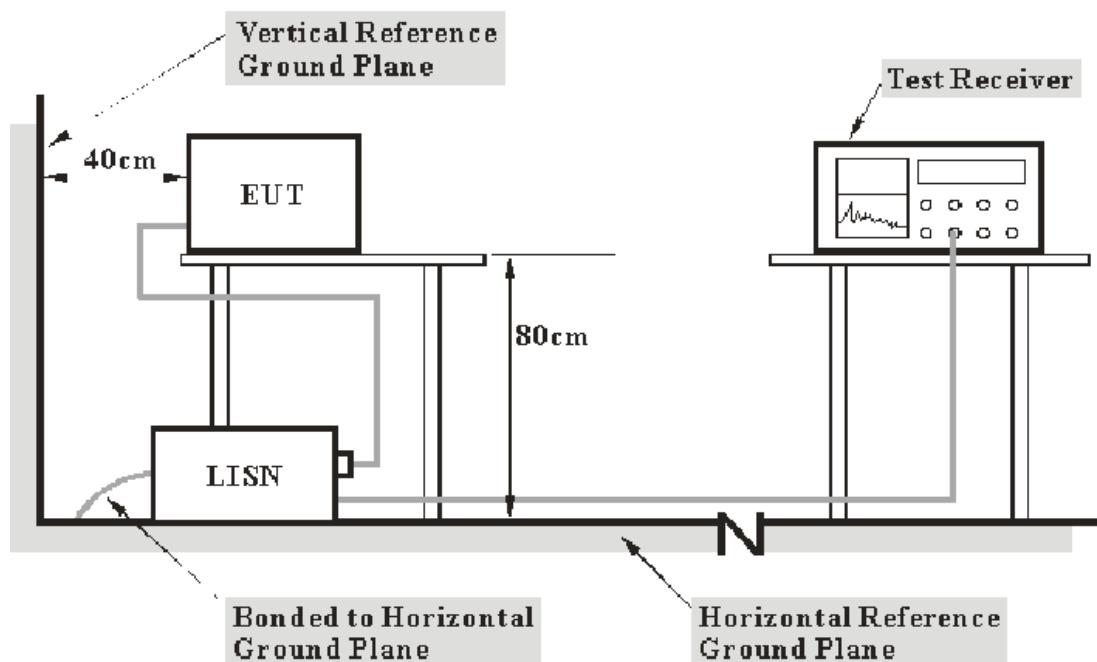
§15.207 (a)- CONDUCTED EMISSION

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 C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 (a) limits.

The adapter was connected to a 120 VAC/60 Hz power source.

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:

Frequency Range	IFBW
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	830245/006	2005-1-26	2006-1-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2005-2-28	2006-2-28

* 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

During the conducted emission test, the Adapter power cord was connected to the outlet of the LISN.

Maximizing procedure were 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:

-12.98 dB at 0.45 MHz in the **Line** conductor mode.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Davis Ma on 2005-12-6.

Test Mode: Transmitting

LINE CONDUCTED EMISSIONS				FCC Part 15.207	
Frequency MHz	Amplitude dB μ V	Detector QP/AV	Phase Line/Neutral	Limit dB μ V	Margin dB
0.450	43.9	QP	Line	56.88	-12.98
0.450	41.5	QP	Neutral	56.88	-15.38
19.775	43.5	QP	Neutral	60.00	-16.50
19.725	43.0	QP	Line	60.00	-17.00
0.275	42.9	QP	Line	60.97	-18.07
0.245	41.5	QP	Neutral	61.92	-20.42
0.165	43.5	QP	Line	65.21	-21.71
25.580	38.0	QP	Neutral	60.00	-22.00
0.175	42.1	QP	Neutral	64.72	-22.62
1.205	31.7	QP	Neutral	56.00	-24.30
25.580	25.6	AV	Neutral	50.00	-24.40
1.185	30.9	QP	Line	56.00	-25.10
19.775	22.2	AV	Neutral	50.00	-27.80
19.725	21.9	AV	Line	50.00	-28.10
4.050	25.9	QP	Line	56.00	-30.10
1.205	15.7	AV	Neutral	46.00	-30.30
1.185	14.4	AV	Line	46.00	-31.60
4.050	12.2	AV	Line	46.00	-33.80
0.450	12.2	AV	Neutral	46.88	-34.68
0.175	18.4	AV	Neutral	54.72	-36.32
0.450	10.4	AV	Line	46.88	-36.48
0.245	14.5	AV	Neutral	51.92	-37.42
0.275	13.5	AV	Line	50.97	-37.47
0.165	16.8	AV	Line	55.21	-38.41

Plot(s) of Test Data

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

Disturbance Voltage test
FCC Part15

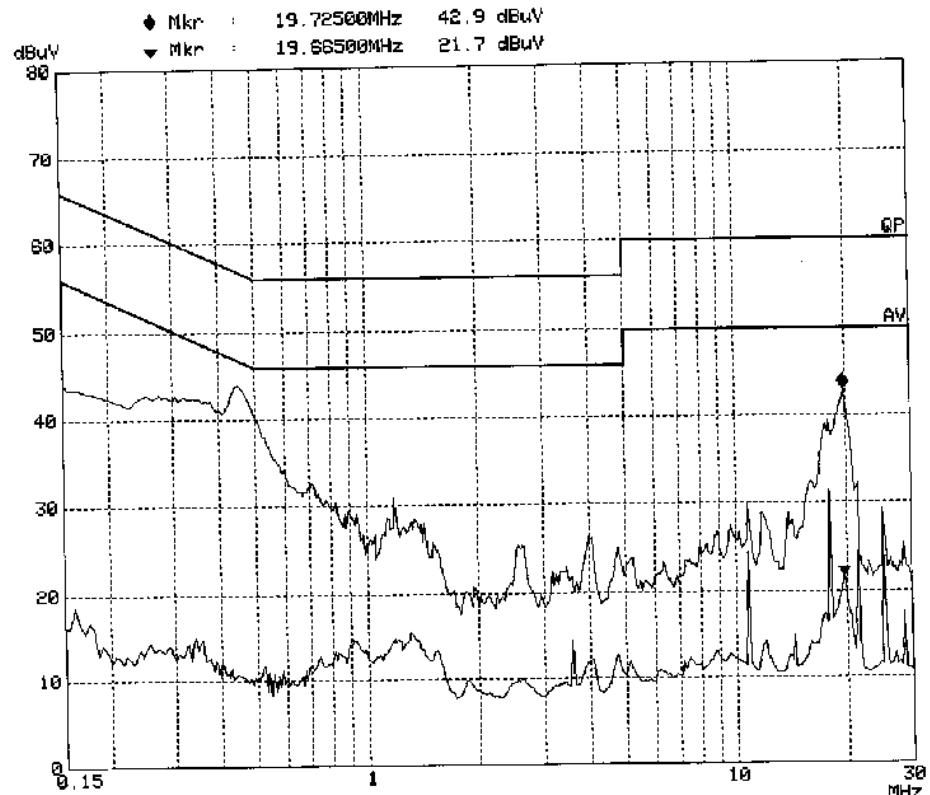
EUT: Telephone Base Station M/N:DSF-2481
Manuf: Audex
Op Cond: Transmitting/Receiving
Operator: Davis
Test Spec: AC 120V/60Hz L
Comment: Temp:25
 Humi:55%
Date: 06. Dec 05 16:57

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN OFF

Transducer No.	Start	Stop	Name
1	9k	30M	FACTOR

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



Disturbance Voltage test FCC Part 15

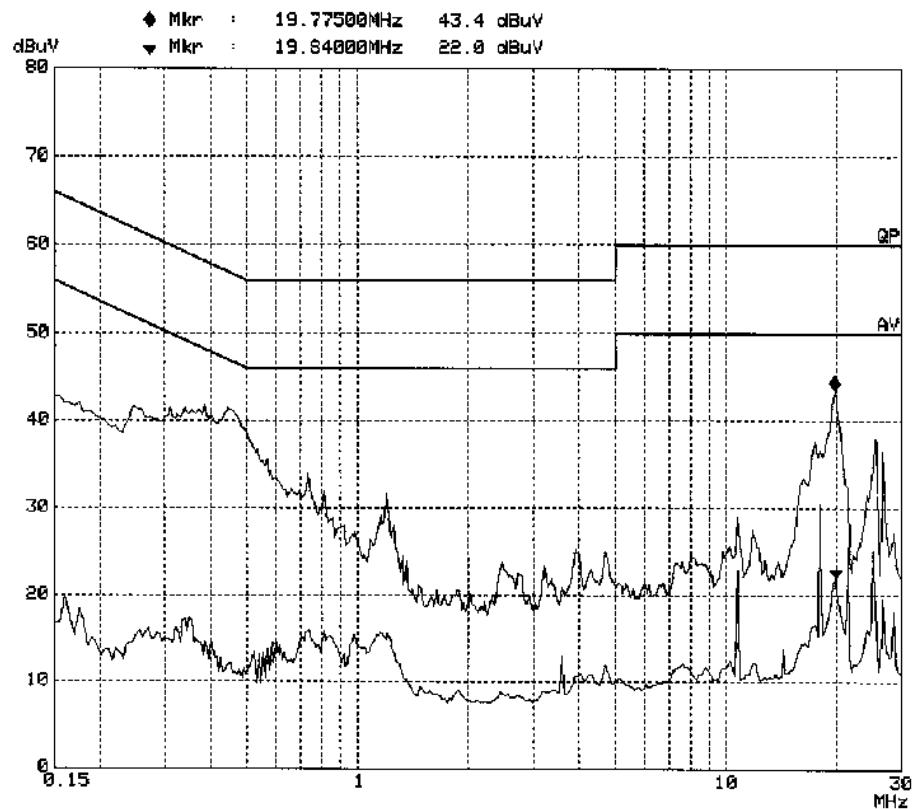
EUT: Telephone Base Station M/N:DSF-2481
Manuf: Audex
Op Cond: Transmitting/Receiving
Operator: Davis
Test Spec: AC 120V/60Hz N
Comment: Temp:25
 Humi:55%
Date: 06. Dec 05 16:40

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	20ms	AUTO	LN OFF

Transducer No.	Start	Stop	Name
1	9k	30M	FACTOR

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



§15.205, §15.209, §15.247 - RADIATED EMISSION

Applicable Standard

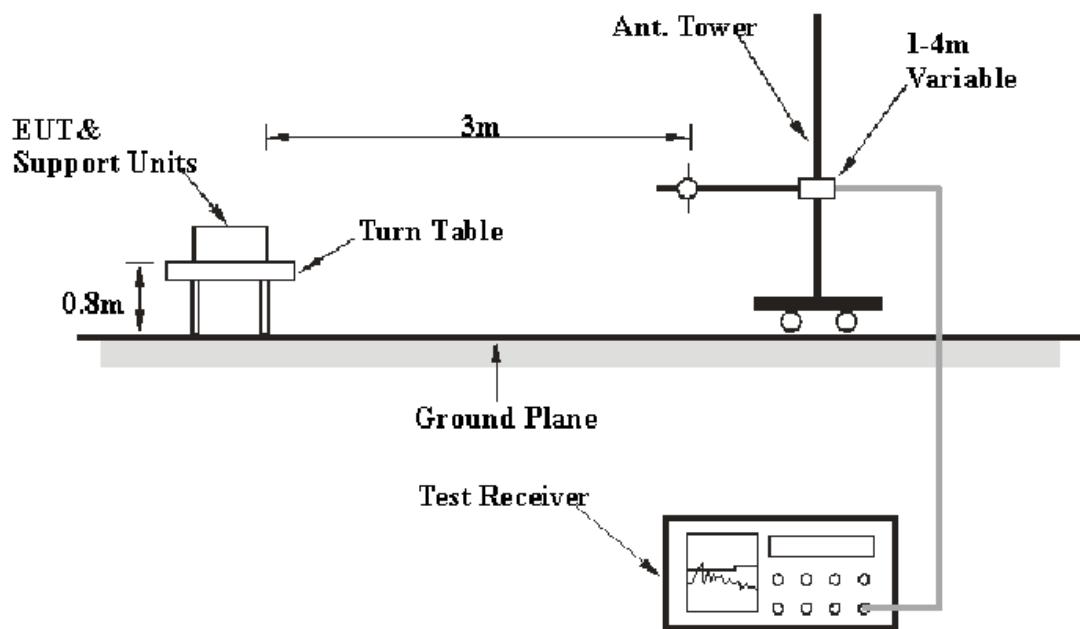
According to FCC §15.247 (d)

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-meter Chamber, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.247 limits.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W
30MHz – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25 GHz	1 MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
A.H. System	Horn Antenna	SAS-200/571	135	2005-4-28	2006-4-28
HP	Amplifier	HP8447D	2944A09795	2005-8-17	2006-8-17
HP	Preamplifier	8449B	3008A00277	2005-8-17	2006-8-17
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2005-11-10	2006-11-10
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2005-4-28	2006-4-28

* **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

For the radiated emissions test, the Adapter power cords were connected to the AC floor outlet.

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

All data was recorded in the PK&AV 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 Amplitude 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 -7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Standard Limit}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209, and 15.247, with the worst margin reading of:

- 3.5 dB at 9608 MHz** in the **Vertical** polarization, Low Channel
- 2.6 dB at 9764 MHz** in the **Horizontal** polarization, Middle Channel
- 3.0 dB at 9920 MHz** in the **Horizontal** polarization, High Channel
- 3.9 dB at 31.29 MHz** in the **Horizontal** polarization, Unintentional Emission

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Simon Mo on 2005-11-30.

Test Mode: Transmitting

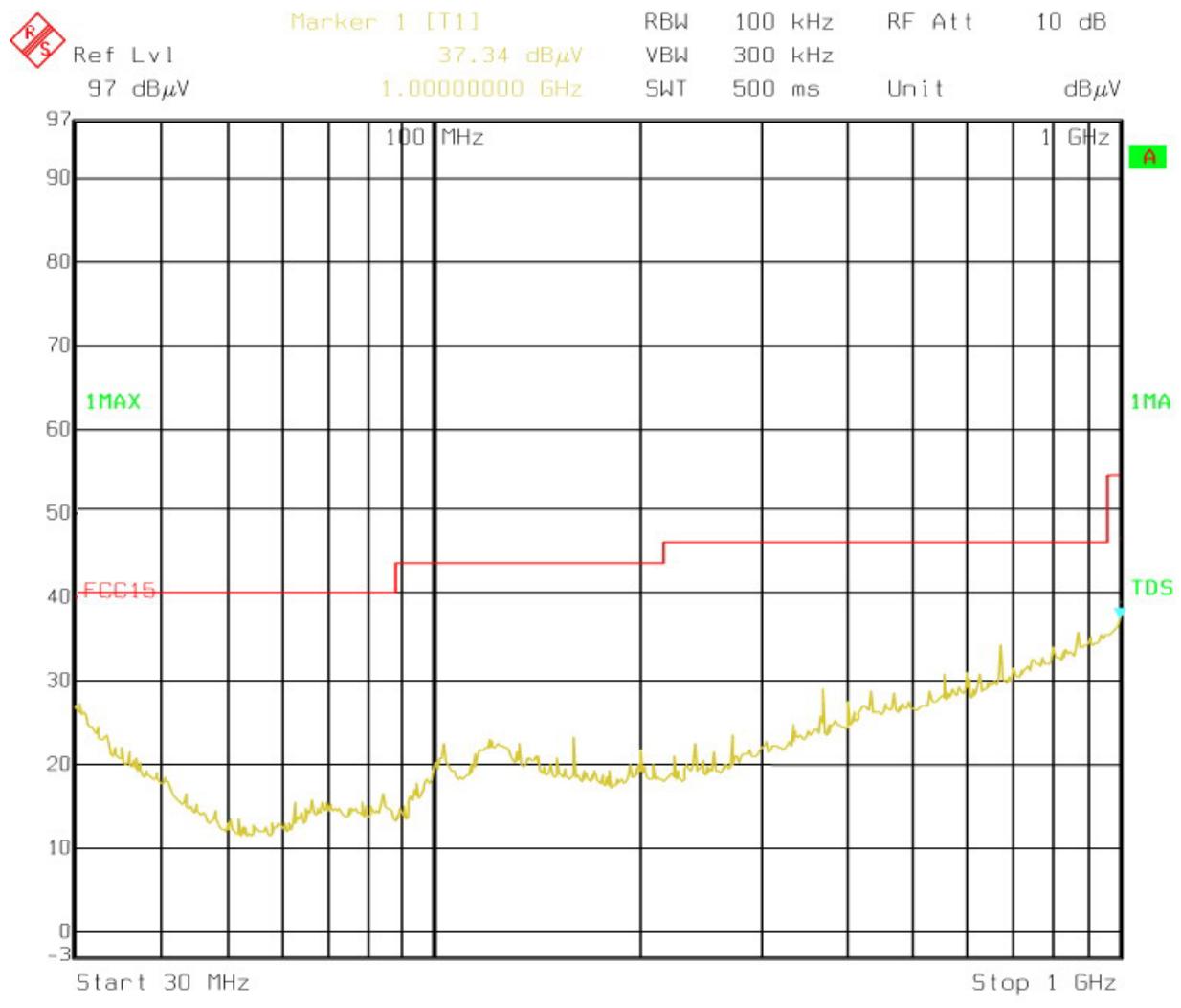
INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C		
Frequency MHz	Meter Reading dB μ V/m	Comments		Angle Degree	Height Meter	Polar H/V	Antenna Loss dB	Cable Loss dB	Amp. Gain dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
Low Channel, 1GHz-25GHz												
2402	81.52	PK(fundamental)	45	1.0	H	28.1	3.7	35.16	78.2			
2402	76.45	AV(fundamental)	180	1.2	H	28.1	3.7	35.16	73.1			
2402	78.77	PK(fundamental)	45	1.0	V	28.1	3.7	35.16	75.4			
2402	76.21	AV(fundamental)	180	1.2	V	28.1	3.7	35.16	72.9			
9608	40.21	AV(harmonic)	60	1.0	V	38.0	7	34.72	50.5	54	-3.5*	
9608	38.14	AV(harmonic)	60	1.0	H	38.0	7	34.72	48.4	54	-5.6	
7206	39.25	AV(harmonic)	180	1.2	H	35.8	6	34.11	46.9	54	-7.1	
7206	38.58	AV(harmonic)	180	1.2	V	35.8	6	34.11	46.3	54	-7.7	
4804	39.14	AV(harmonic)	60	1.0	V	33.8	5.2	33.00	45.1	54	-8.9	
4804	38.47	AV (harmonic)	60	1.0	H	33.8	5.2	33.00	44.5	54	-9.5	
9608	41.53	PK(harmonic)	45	1.2	V	38.0	7	34.72	51.8	74	-22.2	
9608	41.28	PK(harmonic)	45	1.2	H	38.0	7	34.72	51.6	74	-22.4	
7206	40.97	PK(harmonic)	45	1.2	H	35.8	6	34.11	48.7	74	-25.3	
4804	42.06	PK(harmonic)	45	1.0	V	33.8	5.2	33.00	48.1	74	-25.9	
7206	40.36	PK(harmonic)	45	1.2	V	35.8	6	34.11	48.1	74	-26.0	
4804	41.53	PK (harmonic)	45	1.0	H	33.8	5.2	33.00	47.5	74	-26.5	
Middle Channel, 1GHz-25GHz												
2441	79.70	PK (fundamental)	45	1.0	H	28.1	3.7	35.16	76.3			
2441	74.35	AV(fundamental)	180	1.2	H	28.1	3.7	35.16	71.0			
2441	77.37	PK(fundamental)	45	1.0	V	28.1	3.7	35.16	74.0			
2441	74.63	AV(fundamental)	60	1.0	V	28.1	3.7	35.16	71.3			
9764	41.19	AV(harmonic)	60	1.0	H	37.6	7.3	34.72	51.4	54	-2.6*	
9764	39.98	AV(harmonic)	180	1.2	V	37.6	7.3	34.72	50.2	54	-3.8*	
7323	39.24	AV(harmonic)	180	1.2	H	35.8	6.1	34.11	47.0	54	-7.0	
7323	39.05	AV(harmonic)	60	1.0	V	35.8	6.1	34.11	46.8	54	-7.2	
4882	40.25	AV (harmonic)	60	1.0	H	33.8	5.2	33.00	46.3	54	-7.8	
4882	39.68	AV(harmonic)	180	1.2	V	33.8	5.2	33.00	45.7	54	-8.3	
9764	42.97	PK(harmonic)	45	1.2	V	37.6	7.3	34.72	53.2	74	-20.9	
9764	42.83	PK(harmonic)	45	1.2	H	37.6	7.3	34.72	53.0	74	-21.0	
7323	41.06	PK(harmonic)	45	1.2	V	35.8	6.1	34.11	48.9	74	-25.2	
7323	40.86	PK(harmonic)	45	1.2	H	35.8	6.1	34.11	48.7	74	-25.4	
4882	42.37	PK (harmonic)	45	1.0	H	33.8	5.2	33.00	48.4	74	-25.6	
4882	41.11	PK(harmonic)	45	1.2	V	33.8	5.2	33.00	47.1	74	-26.9	

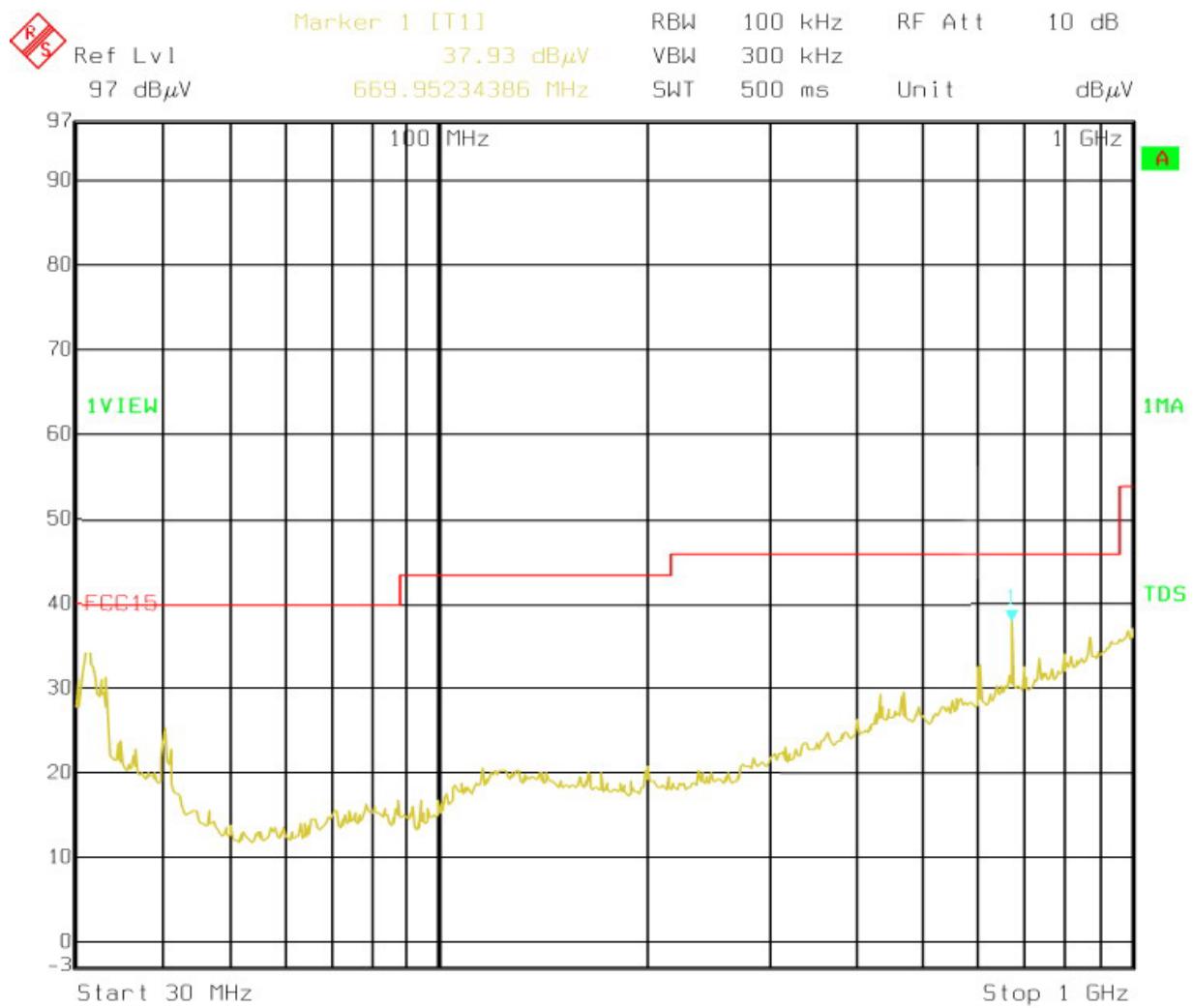
INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency MHz	Meter Reading dB μ V/m	Comments		Angle Degree	Height Meter	Polar H/V	Antenna Loss dB	Cable Loss dB		Corr. Ampl. dB μ V/m	Limit dB μ V/m
High Channel, 1GHz-25GHz											
2480	80.03	PK (fundamental)	45	1.0	H	28.1	3.7	35.16	76.7		
2480	76.24	AV(fundamental)	180	1.2	H	28.1	3.7	35.16	72.9		
2480	76.62	PK(fundamental)	45	1.0	V	28.1	3.7	35.16	73.3		
2480	74.11	AV(fundamental)	60	1.0	V	28.1	3.7	35.16	70.8		
9920	40.78	AV(harmonic)	60	1.0	H	37.6	7.3	34.72	51.0	54	-3.0*
9920	39.97	AV(harmonic)	180	1.2	V	37.6	7.3	34.72	50.2	54	-3.9*
4960	41.58	AV (harmonic)	60	1.0	H	33.8	5.2	33.00	47.6	54	-6.4
7440	38.65	AV(harmonic)	180	1.2	H	35.8	6.1	34.11	46.4	54	-7.6
4960	40.05	AV(harmonic)	180	1.2	V	33.8	5.2	33.00	46.1	54	-8.0
7440	38.26	AV(harmonic)	60	1.0	V	35.8	6.1	34.11	46.1	54	-8.0
9920	42.92	PK(harmonic)	45	1.2	H	37.6	7.3	34.72	53.1	74	-20.9
9920	41.57	PK(harmonic)	45	1.2	V	37.6	7.3	34.72	51.8	74	-22.3
4960	43.37	PK (harmonic)	45	1.0	H	33.8	5.2	33.00	49.4	74	-24.6
7440	40.15	PK(harmonic)	45	1.2	H	35.8	6.1	34.11	47.9	74	-26.1
7440	40.00	PK(harmonic)	45	1.2	V	35.8	6.1	34.11	47.8	74	-26.2
4960	41.24	PK(harmonic)	45	1.2	V	33.8	5.2	33.00	47.2	74	-26.8

30MHz – 1GHz

Frequency MHz	Meter Reading dB μ V/m	Indicated		Table	Antenna		Correction Factor			FCC Part 15.209	
		Comments	Direction		Height Degree	Polar Meter	Antenna H/V	Loss dB	Cable dB	Amp. dB	Corr. Gain Ampl. dB μ V/m
31.29	37.6	PK	45	1.0	V	24.1	1.2	26.8	36.1	40	-3.9*
669.95	39.3	PK	90	1.2	V	20.3	5.4	27.1	37.9	46	-8.1
669.95	35.5	PK	180	1.2	H	20.3	5.4	27.1	34.1	46	-11.9
40.29	36.3	PK	60	1.2	V	14.3	1.3	26.8	25.1	40	-14.9
33.56	25.3	PK	289	1.0	H	24.1	1.2	26.8	23.8	40	-16.2
1000	32.5	PK	45	1.0	H	23.8	7.0	26	37.3	54	-16.7
433.33	34.7	PK	45	1.2	V	16.8	4.1	26.5	29.1	46	-16.9
159.75	34.8	PK	45	1.2	H	12.8	2.1	26.6	23.1	43.5	-20.4
103.33	37.3	PK	60	1.0	H	9.6	2.0	26.6	22.3	43.5	-21.2
200.04	31.5	PK	35	3.8	V	12.6	2.6	26	20.6	43.5	-22.9
115.63	31.5	PK	35	3.8	V	13.3	2.1	26.6	20.3	43.5	-23.2
62.74	32.5	PK	289	1.0	H	8.1	1.6	26.8	15.4	40	-24.6

* Within the measurement uncertainty.





§15.247(a)(1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB Bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2005-8-17	2006-8-17

* **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

1. Set the EUT in transmitting mode, spectrum Bandwidth was set at 100 kHz, maxhold the channel.
2. Set the adjacent channel of the EUT maxhold another truce
3. Measure the channel separation.

Limit

FCC Part 15, Subpart C Section 15.247(a)(1). Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB Bandwidth of the hopping channel, whichever is greater.

FREQUENCY RANGE (MHz)	Limit (kHz)
902-928	>25kHz
2400-2483.5	>25kHz
5725-5850	>25kHz

Test Data

Environmental Conditions

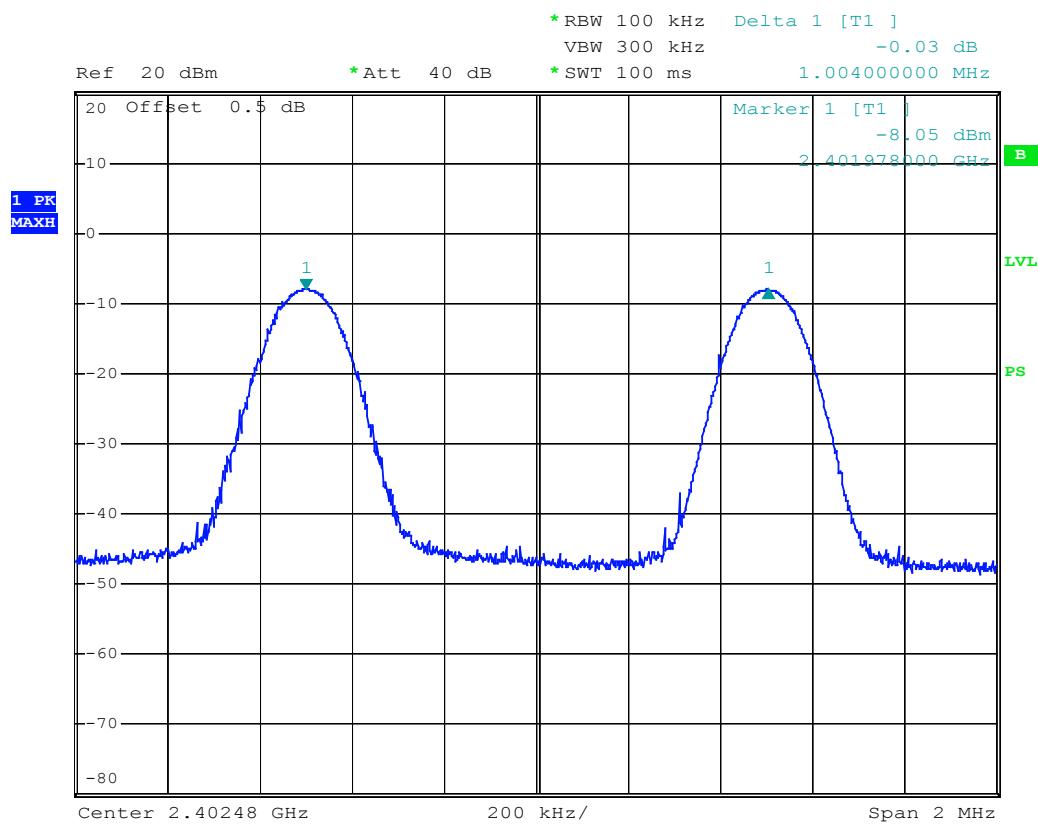
Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

The testing was performed by Jandy Su on 2005-12-1.

Test Result: Pass

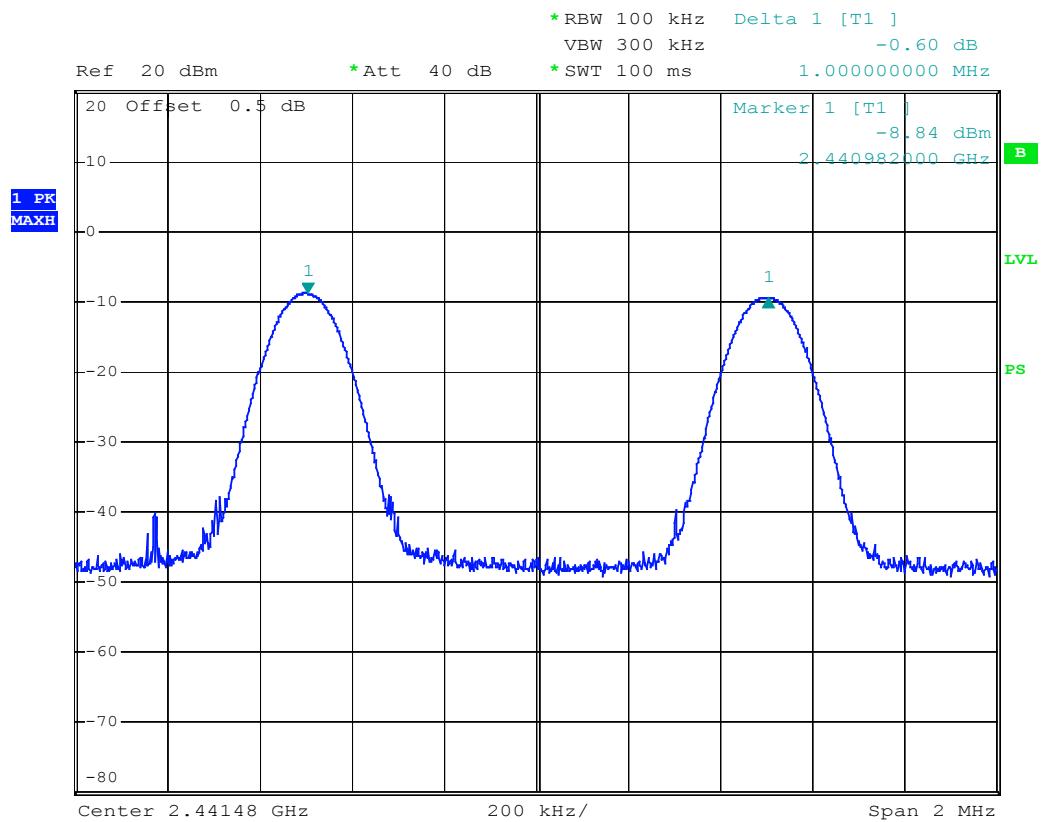
Test mode: Transmitting

CHANNEL	CHANNEL FREQUENCY (MHz)	SEPARATION READ VALUE (kHz)	SEPARATION LIMIT (kHz)
Low Channel	2402	1000	182.67
Adjacency Channel	2403		
Middle Channel	2441	1000	186.67
Adjacency Channel	2442		
High Channel	2479	1000	182.00
Adjacency Channel	2480		



Audex Telephone base sation M/N:DSF-2481 CH seperation low ch

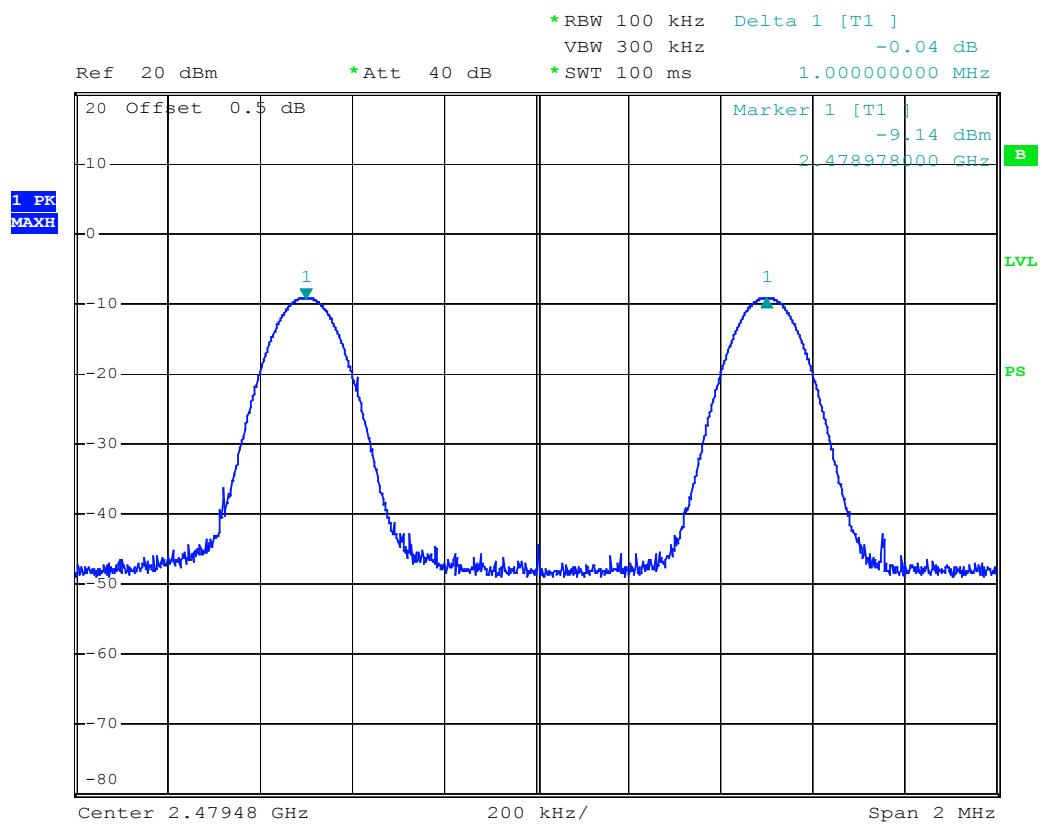
Date: 1.DEC.2005 10:12:53



Audex Telephone base sation M/N:DSF-2481 CH seperation mid c

h

Date: 1.DEC.2005 10:14:47



Audex Telephone base sation M/N:DSF-2481 CH seperation high
ch

Date: 1.DEC.2005 10:17:20

§15.247(a)(1) –20dB BANDWIDTH TESTING

Applicable Standard

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB Bandwidth of the hopping channel, whichever is greater.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17

* **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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

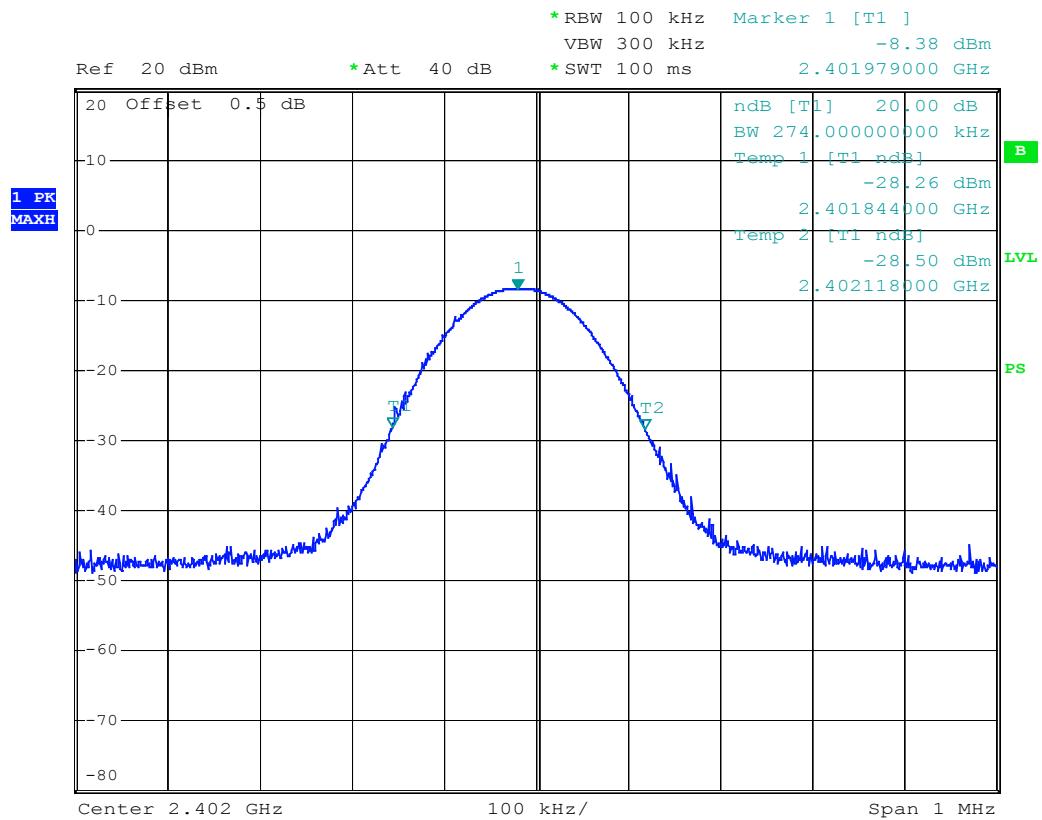
Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Jandy Su on 2005-12-1.

Test Result: Pass

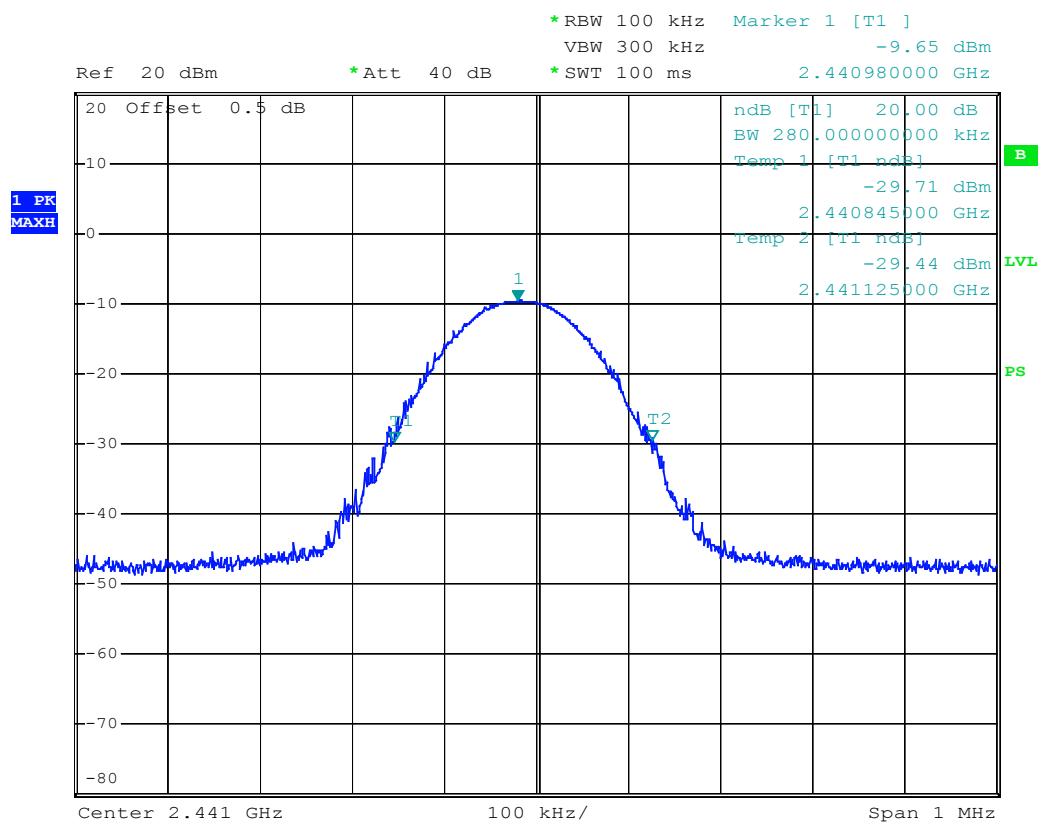
Test Mode: Transmitting

Channel	Channel frequency (MHz)	20dB Bandwidth (kHz)
Low Channel	2402	274
Middle Channel	2441	280
High Channel	2480	273



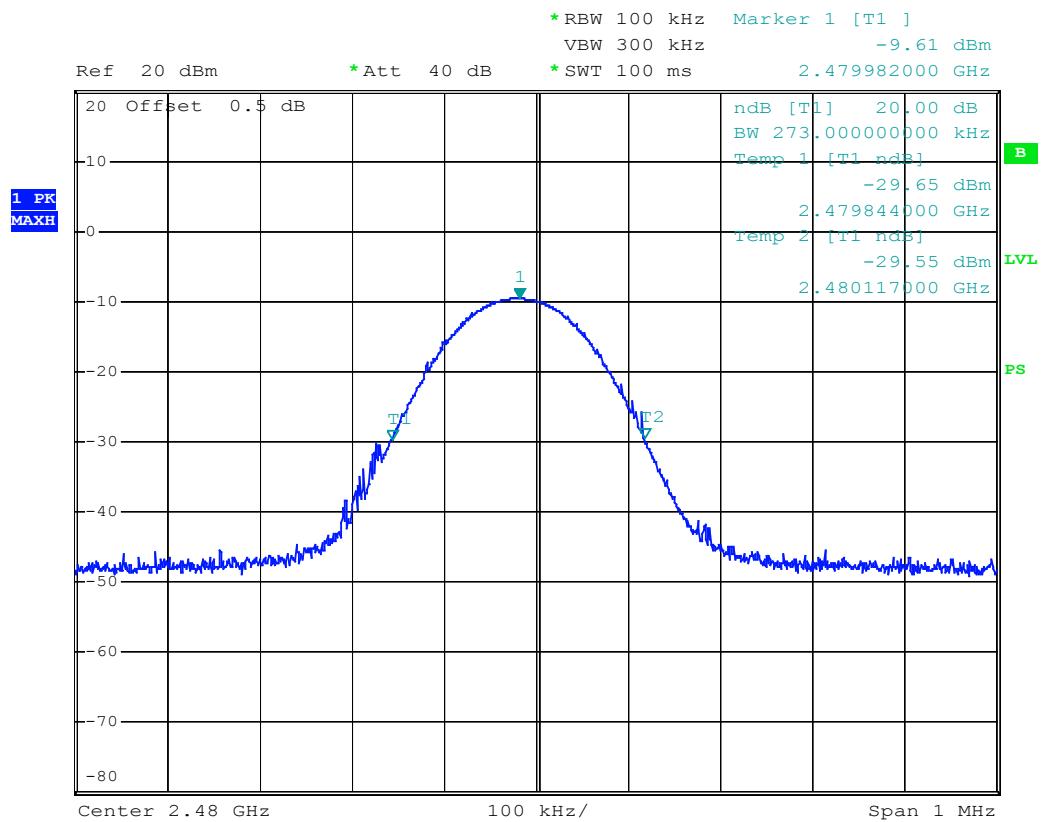
Audex Telephone base sation M/N:DSF-2481 20dB BW low ch

Date: 1.DEC.2005 10:06:37



Audex Telephone base sation M/N:DSF-2481 20dB BW mid ch

Date: 1.DEC.2005 10:05:57



Audex Telephone base sation M/N:DSF-2481 20dB BW high ch

Date: 1.DEC.2005 10:00:49

§15.247(a)(1)(iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17

* **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

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in transmitting mode from first channel to last.
3. By using the Max-Hold function record the Quantity of the channel.

Limit

FCC Part 15, Subpart C Section 15.247

FREQUENCY RANGE (MHz)	Limit (Quantity of Hopping Channel)			
	20 dB bandwidth <250 kHz	20 dB bandwidth >250 kHz	20 dB bandwidth <1 MHz	20 dB bandwidth >1 MHz
902-928	50	25	N/A	N/A
2400-2483.5	N/A	N/A	15	15
5725-5850	N/A	N/A	75	N/A

Test Data

Environmental Conditions

Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

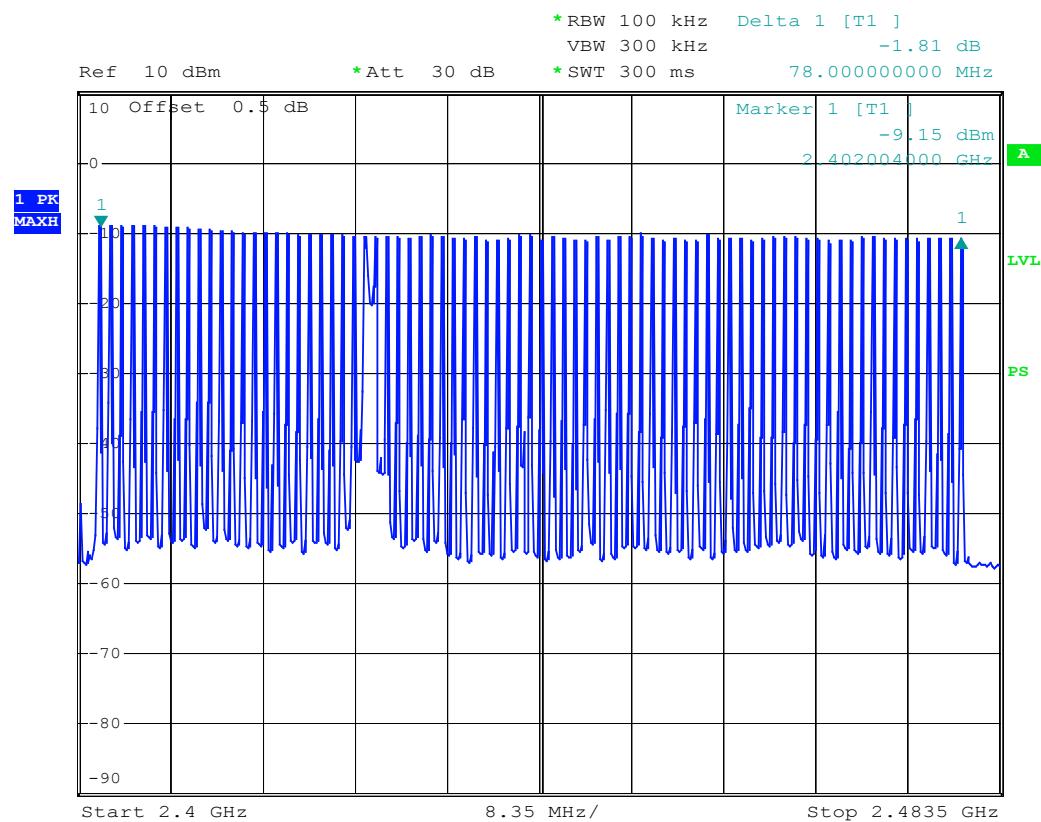
The testing was performed by Jandy Su on 2005-12-2

Test Result: Pass

Test mode: Transmitting

The frequency hopping systems operating in 2.402~2.480 GHz band employ 79 nonoverlapping channels.

Hopping Channel Frequency Range (MHz)	Quantity OF hopping Channel Read Value (Channel)	Quantity Of Hopping channel limit (Channel)
2402.0 ~ 2480.0	79	>15



Audex M/N:DSF-2481 NO. of CHs

Date: 2.DEC.2005 07:54:52

§15.247(a)(1)(iii) -TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17

* **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

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no.(s), The quantity of False was get from single sweep. In addition, the time of single Pluses was tested.

Limit

FCC Part 15, Subpart C Section 15.247.

FREQUENCY RANGE (MHz)	LIMIT (ms)		
	20dB bandwidth <250kHz (50 Channel)	20dB bandwidth >250kHz (50 Channel)	20dB bandwidth <1 MHz (79 Channel)
902-928	400(20s)	400(10s)	N/A
2400-2483.5	N/A	N/A	400(31.6s)
5725-5850	N/A	N/A	400(30s)

Test Data

Environmental Conditions

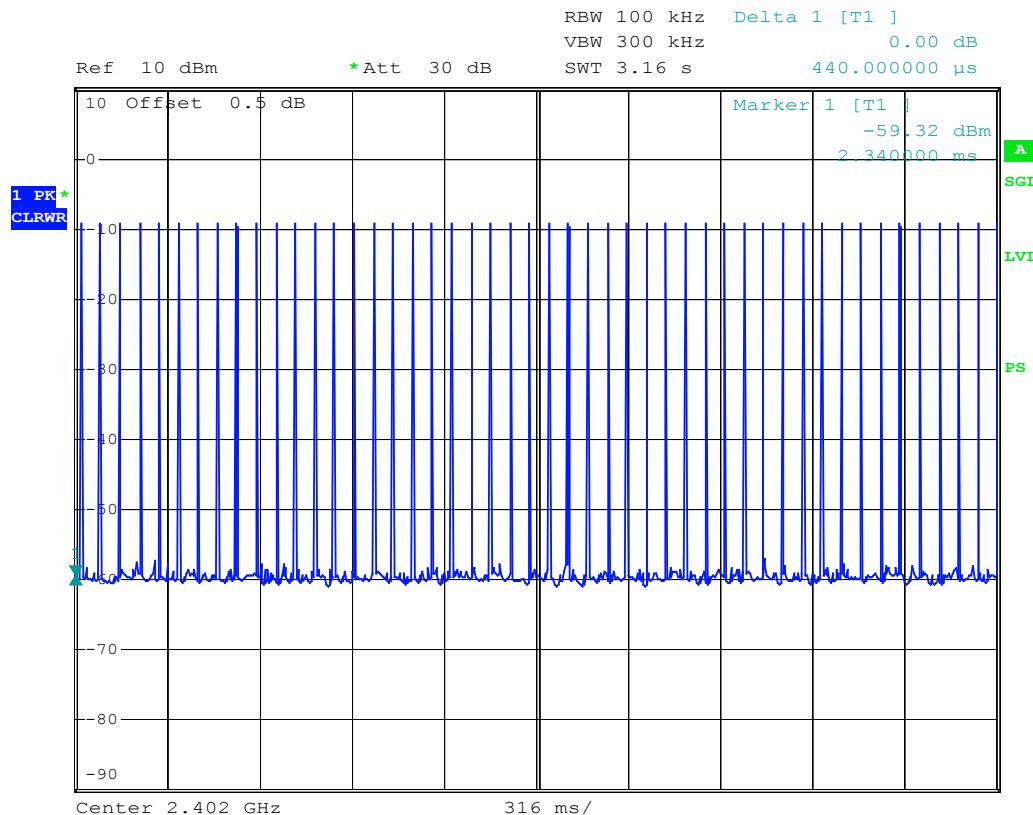
Temperature:	27 °C
Relative Humidity:	50 %
ATM Pressure:	1009 mbar

The testing was performed by Jandy Su on 2005-12-2.

Test Result: Pass

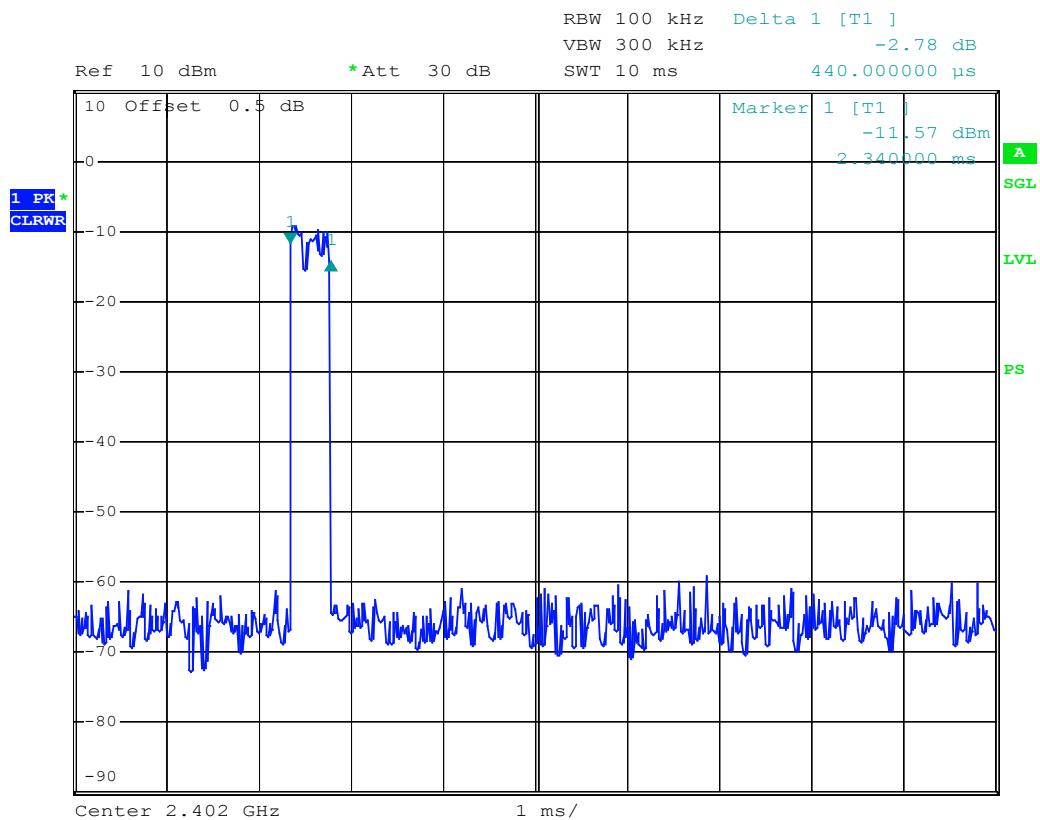
Test mode: Transmitting

Channel	Frequency MHz	Pulse Wide m Sec	Quantity Pulse per 31.6 Sec	Dwell Time Sec	Limit Sec
Low channel	2402	0.44	470	0.21	0.4
Middle channel	2441	0.44	470	0.21	0.4
High channel	2480	0.46	470	0.21	0.4



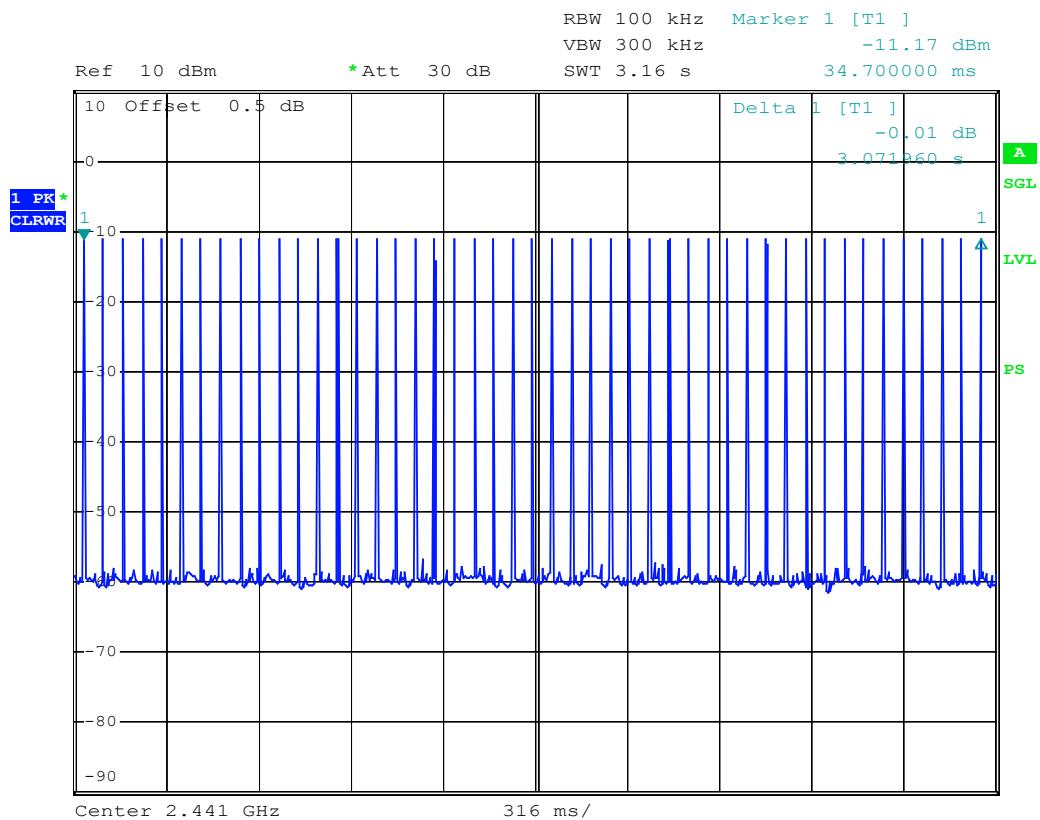
Audex M/N:DSF-2481 NO. of pluses low ch

Date: 2.DEC.2005 09:07:46



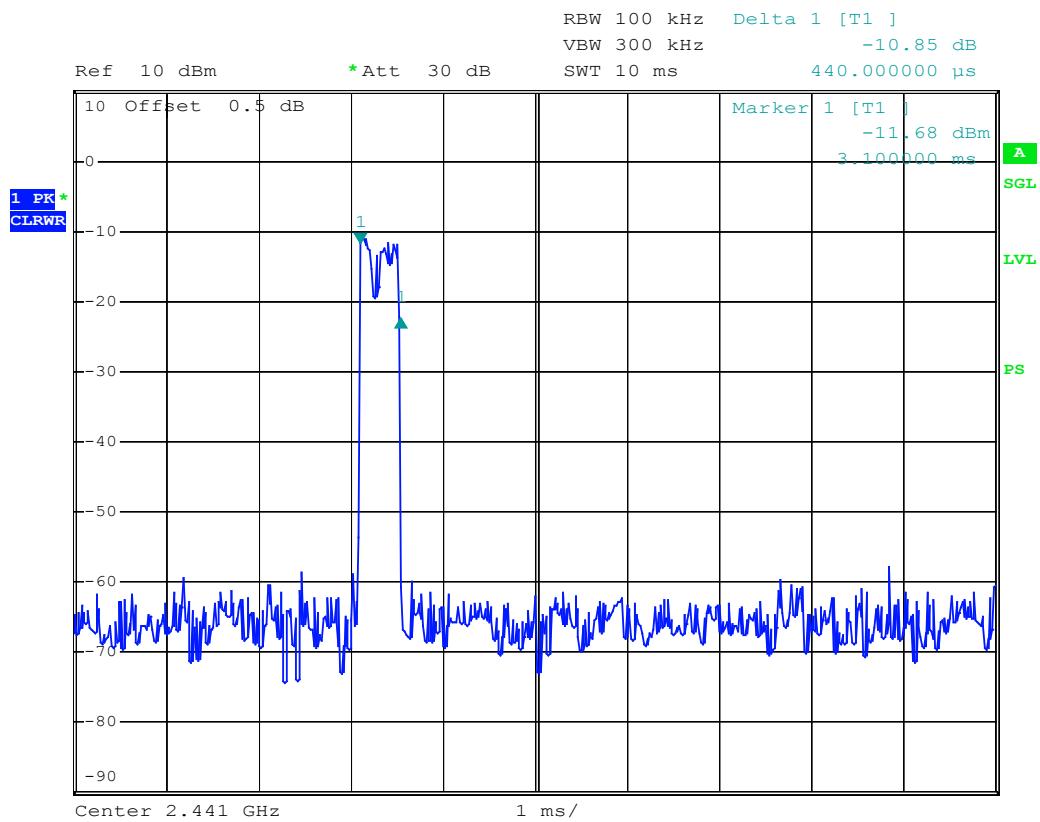
Audex M/N:DSF-2481 pluses low ch

Date: 2.DEC.2005 09:05:57



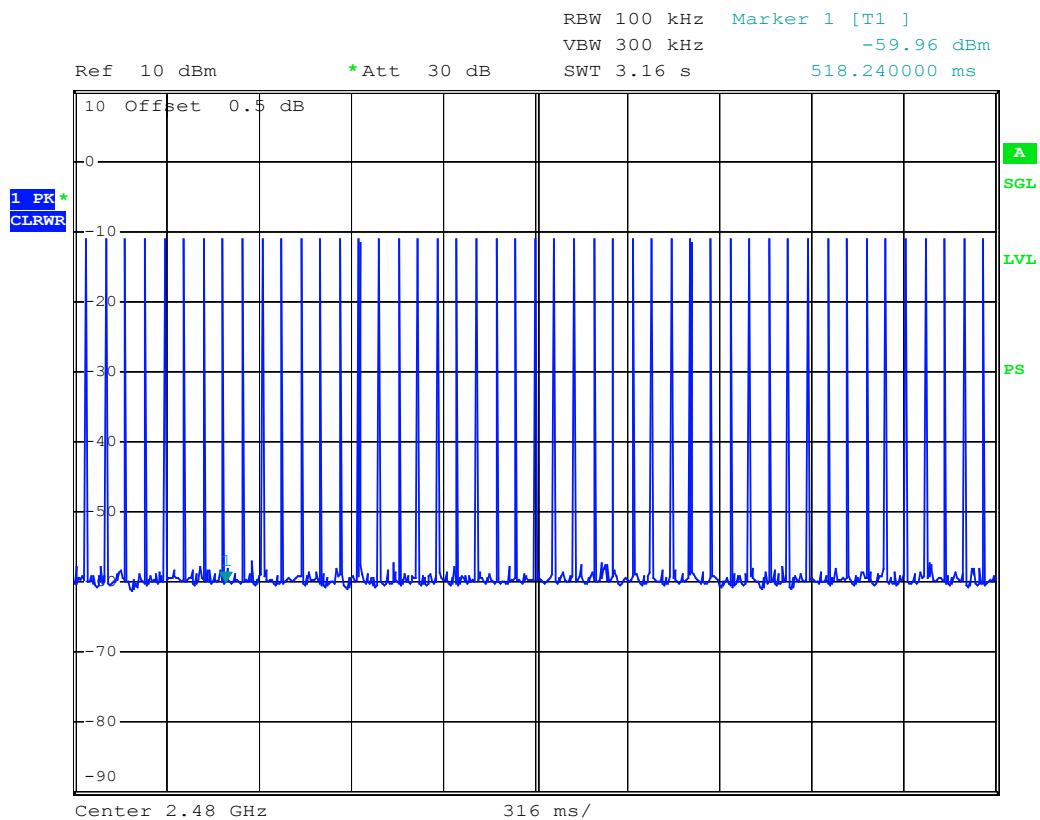
Audex M/N:DSF-2481 NO. of pluses mid ch

Date: 2.DEC.2005 09:03:13



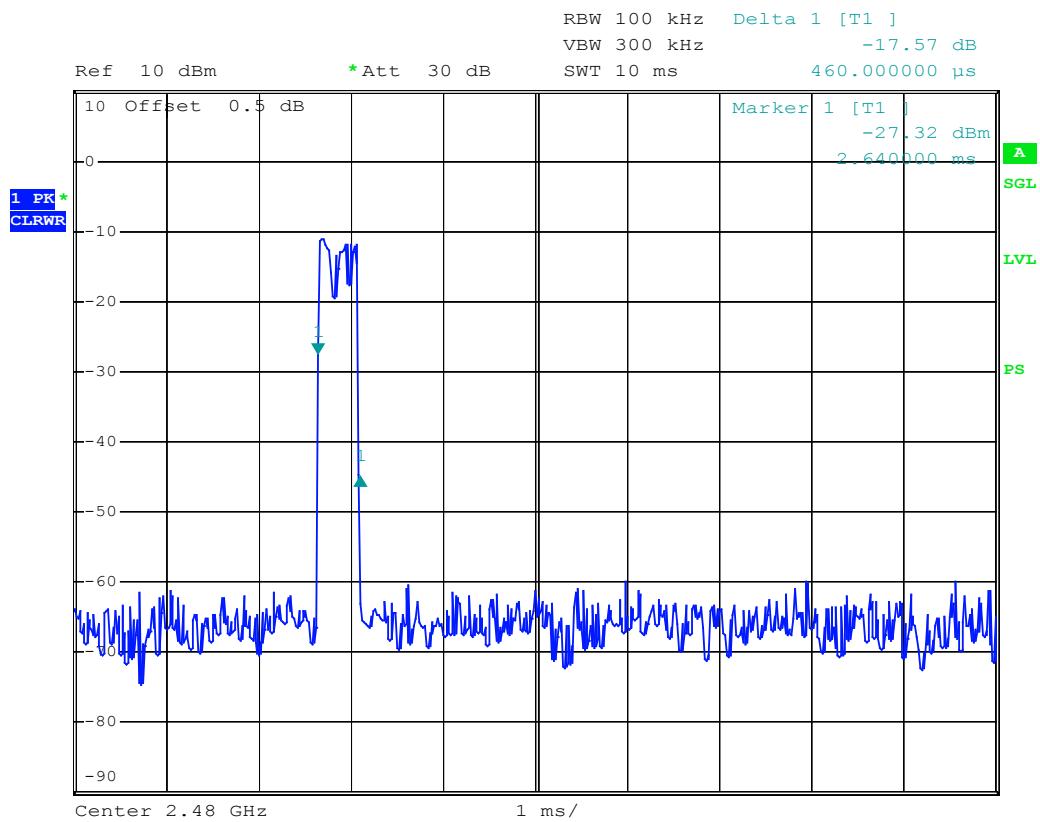
Audex M/N:DSF-2481 pluses width mid ch

Date: 2.DEC.2005 09:01:21



Audex M/N:DSF-2481 NO. of pluses high ch

Date: 2.DEC.2005 08:57:49



Audex M/N:DSF-2481 pluses width high ch

Date: 2.DEC.2005 09:00:07

§15.247(b)(1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17

* **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

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a EMI Test Receiver.
3. Add a correction factor to the display.



Test Data

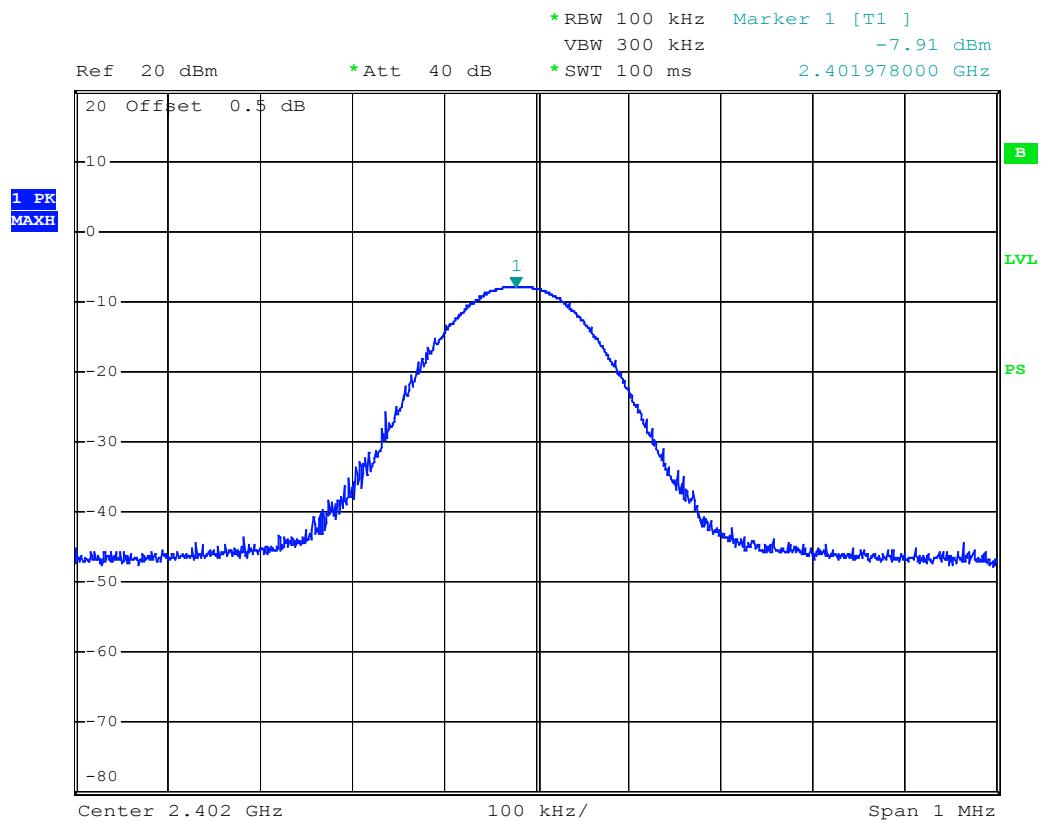
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Jandy Su on 2005-12-1.

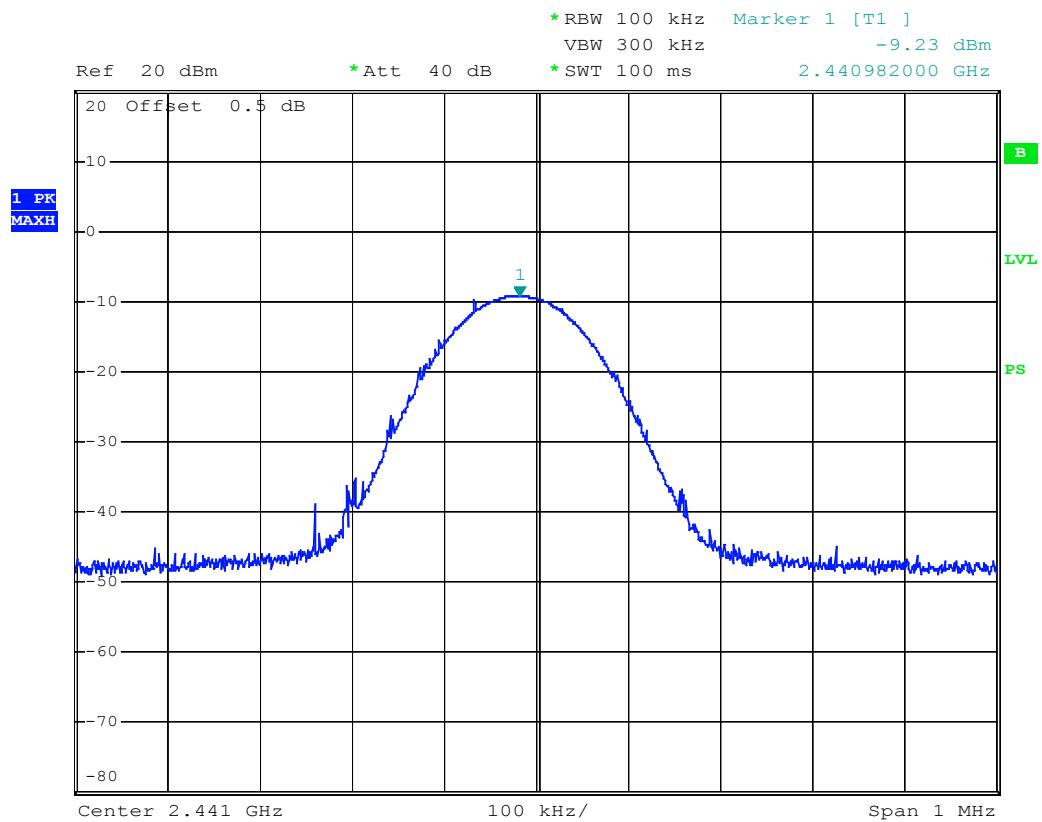
Please refer to the following plots.

Channel	Frequency (MHz)	Peak output power(dBm)	Peak Output Power (mW)	Limit (W)
Low Channel	2402	-9.61	0.12	1
Middle Channel	2441	-9.23	0.12	1
High Channel	2480	-9.56	0.11	1



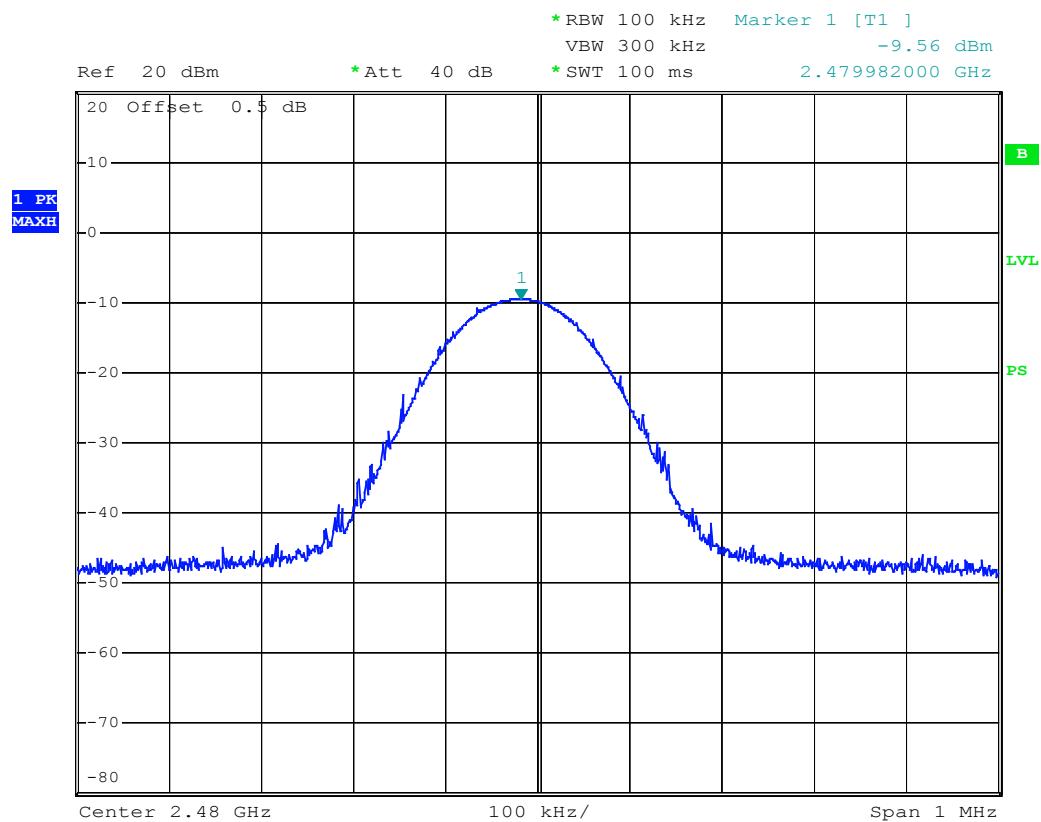
Audex Telephone base sation M/N:DSF-2481 low ch

Date: 1.DEC.2005 09:56:48



Audex Telephone base sation M/N:DSF-2481 mid ch

Date: 1.DEC.2005 09:57:29



Audex Telephone base sation M/N:DSF-2481 high ch

Date: 1.DEC.2005 09:59:26

§15.247(d) - 100 KHZ BANDWIDTH OF BAND EDGES**Applicable Standard**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17

* **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

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

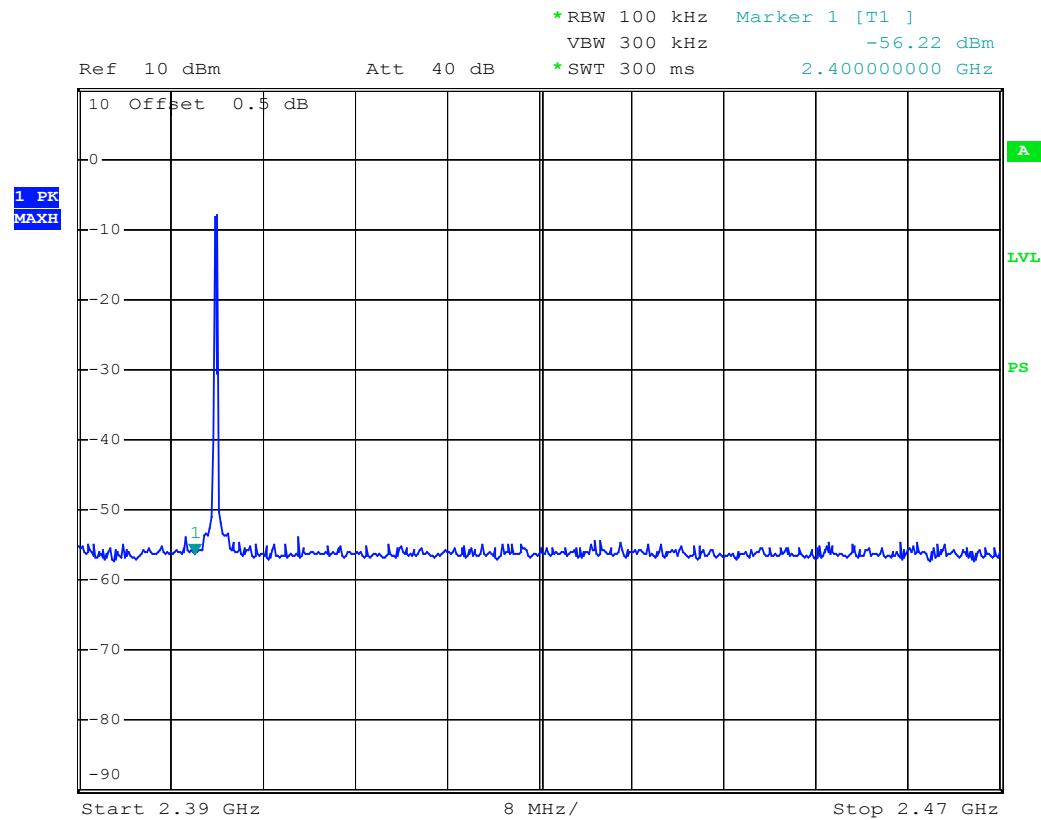
Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1009mbar

The testing was performed by Jandy Su on 2005-12-1.

Test Result: Pass

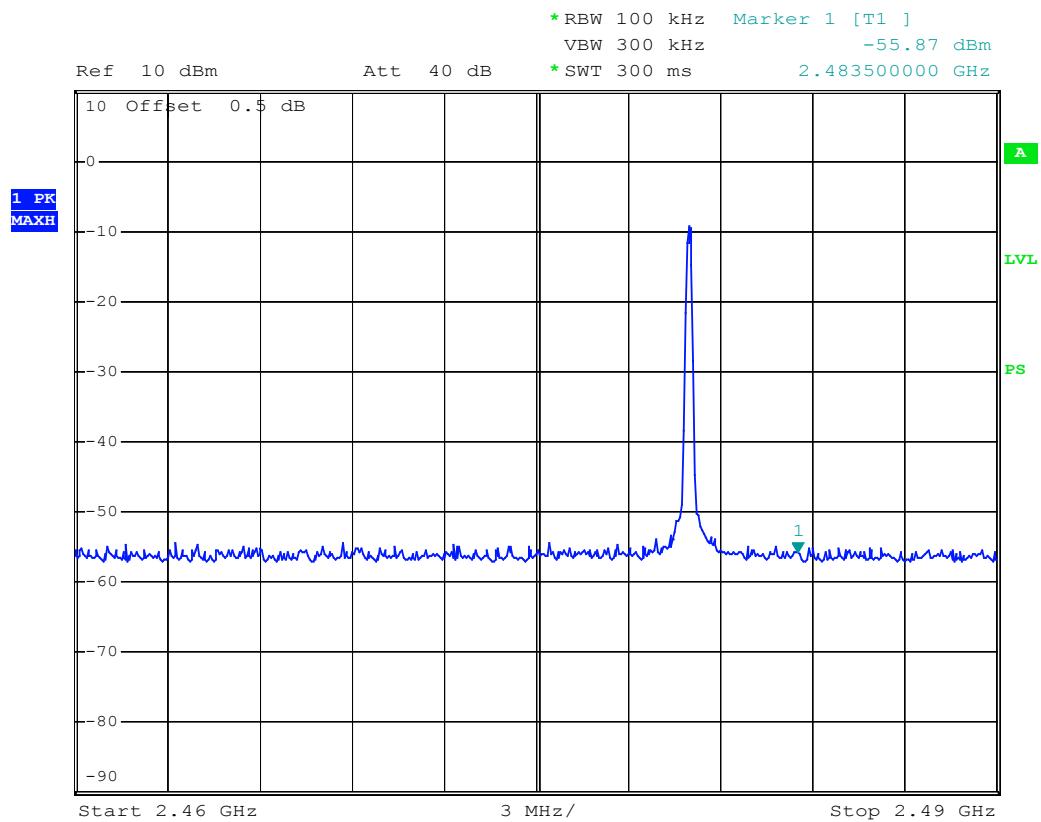
Test Mode: Transmitting

Frequency MHz	Delta of Peak to Edge Point dB	Limit dB
2400.00	48	≥20
2483.50	46	≥20



Audex Telephone base sation M/N:DSF-2481 Bandedge low ch

Date: 1.DEC.2005 14:38:23



Audex Telephone base sation M/N:DSF-2481 Bandedge high ch

Date: 1.DEC.2005 14:40:09