



NVLAP LAB CODE 200707-0



FCC PART 24E

MEASUREMENT AND TEST REPORT

For

JDTECK INC

107 South Hoagland Blvd,
Kissimmee, FL 34741, USA

FCC ID: SQX-JD60-8-19

Report Type: Original Report	Product Type: Wireless Cellular Repeater
Test Engineer: <u>Bruce Zhang</u> <i>Bruce Zhang</i>	
Report Number: <u>RSZ10051806</u>	
Report Date: <u>2010-06-29</u>	
Reviewed By: <u>EMC Engineer</u> <i>Merry Zhao</i> <i>Merry Zhao</i>	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *JDTECK INC*'s product, model number: *JD60-8-19 (FCC ID: SQX-JD60-8-19)* or the "EUT" as referred to in this report is a *Wireless Cellular Repeater*, which measures approximately: 25.0 cm L x 22.0 cm W x 5.3 cm H, rated input voltage: DC 12 V adapter.

Adapter Information: AC/DC ADAPTER

MODEL: GM601-120300

INPUT: 100-240V 50/60Hz 2.0A

OUTPUT: 12V 3.0A

Frequency Range:

PCS Band: 1850-1910 MHz (Uplink), 1930-1990 MHz (Downlink)

Modulation Mode: GMSK

Transmitter Output Power:

PCS Band: 20 dBm (Uplink), 27 dBm (Downlink)

** All measurement and test data in this report was gathered from production sample serial number: 1005040 (Assigned by BACL, Shenzhen). The EUT was received on 2010-05-18.*

EUT Photo



Please see additional photos in Exhibit B & C

Objective

This type approval report is prepared on behalf of *JDTECK INC* in accordance with Part 2, Subpart J, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 24 Subpart E - Personal Communication Services

Applicable Standards: TIA/EIA 603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories 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 Laboratories 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, China.

Test site at Bay Area Compliance Laboratories 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 21, 2007. 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. 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 Laboratories 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/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-C.

The final qualification test was performed with the EUT operating at normal mode.

Equipment Modifications

No modifications were made to the EUT.

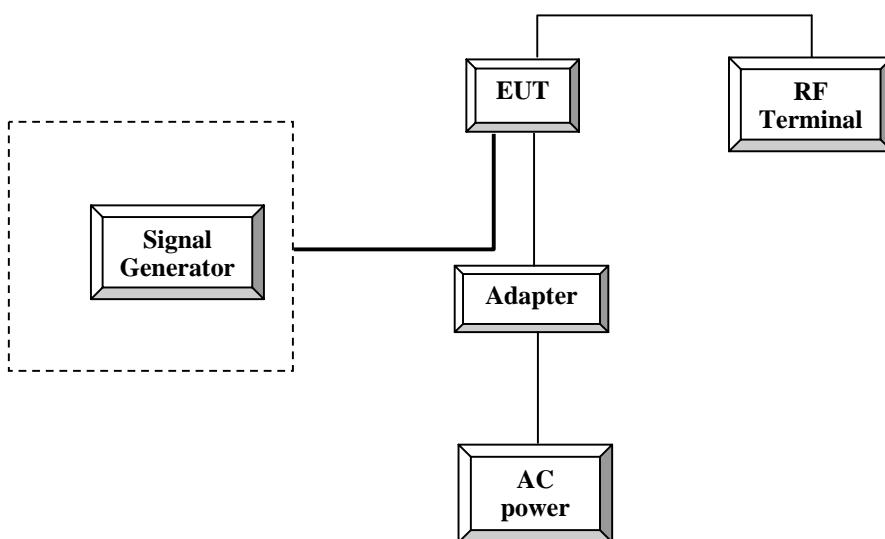
Local Support Equipment List and Details

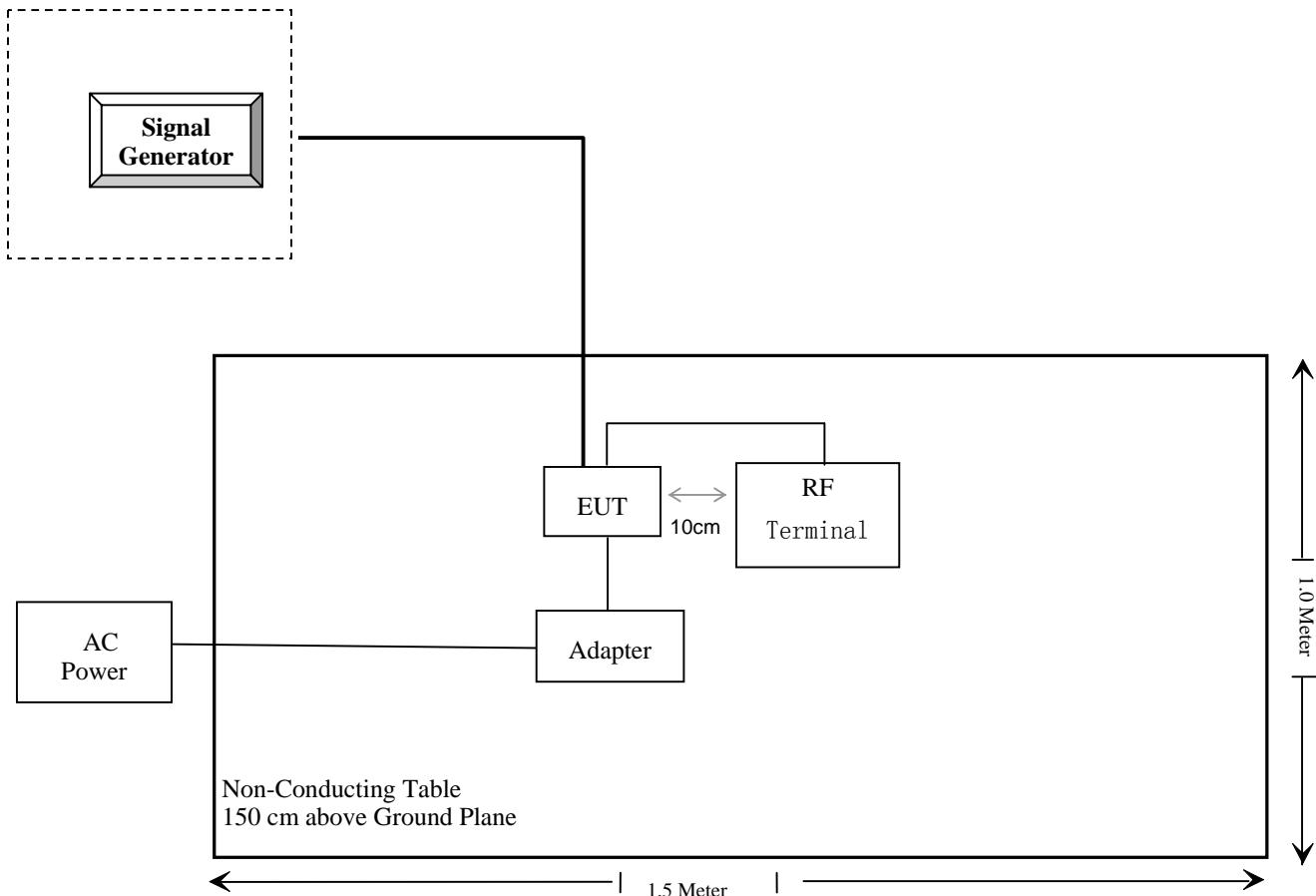
Manufacturer	Description	Model	Serial Number	FCC ID
R&S	Universal Radio Communication Tester	CMU200	109038	N/A

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable Power Cable with a core	1.90	AC power	Adapter
Unshielded Detachable Power Cable	1.20	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b)(1), §2.1091	Maximum Permissible exposure (MPE)	Compliant
§2.1046; §24.232 (c)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	N/A
§2.1049; §24.238	99% & -26 dB Occupied Bandwidth	Compliant
§2.1051, §24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§2.1053; §24.238 (a)	Field Strength of Spurious Radiation	Compliant
§24.238 (a)	Out of band emission, Band Edge	Compliant
§2.1055; §24.235	Frequency stability vs. temperature Frequency stability vs. voltage	N/A*

N/A*: There is no frequency translation or oscillator circuit included in this device.

FCC §1.1307 & §2.1091 - RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b)(1) and §2.1091, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²)

P = output power to antenna

G= Antenna Gain

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency Band	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
Uplink	1880	14	25.12	19.89	97.50	20	0.488	1.0
Downlink	1989.8	7	5.01	26.99	500.03	20	0.499	1.0

The predicted power density level at 20 cm is 0.488 mw/cm² for uplink, 0.499 mw/cm² for downlink, which is below the ordinary/controlled exposure limit of 1 mw/cm². The EUT is used at least 20 cm away from user's body. It is determined as mobile equipment and complies with the MPE limit.

Result: Pass

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC §2.1047(d) and Part 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046 & § 24.232 (c) - RF OUTPUT POWER

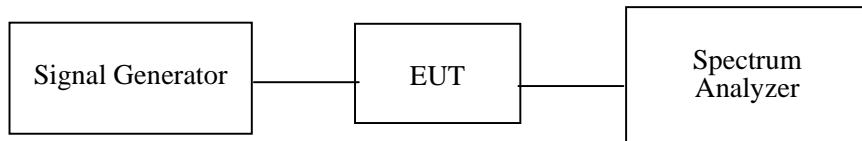
Applicable Standard

FCC §2.1046 and §24.232 (c)

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PSA Series Spectrum Analyzer	E4443A	MY45300749	2010-01-07	2011-01-07
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2009-11-20	2010-11-20

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

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Bruce Zhang on 2010-06-07.

Conducted Power

Frequency Band	Channel	Frequency (MHz)	Output Power (dBm)
Uplink	Low	1850.2	19.72
	Middle	1880.0	19.89
	High	1909.8	19.75
Downlink	Low	1930.2	26.19
	Middle	1960.0	26.94
	High	1989.8	26.99

FCC §2.1049 & §24.238 - OCCUPIED BANDWIDTH

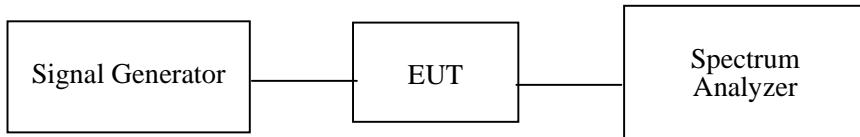
Applicable Standards

FCC §2.1049 and §24.238.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at least 1% of the bandwidth (PCS) and the 26 dB & 99% bandwidth were recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2009-11-20	2010-11-20
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Bruce Zhang on 2010-05-13 to 2010-06-29.

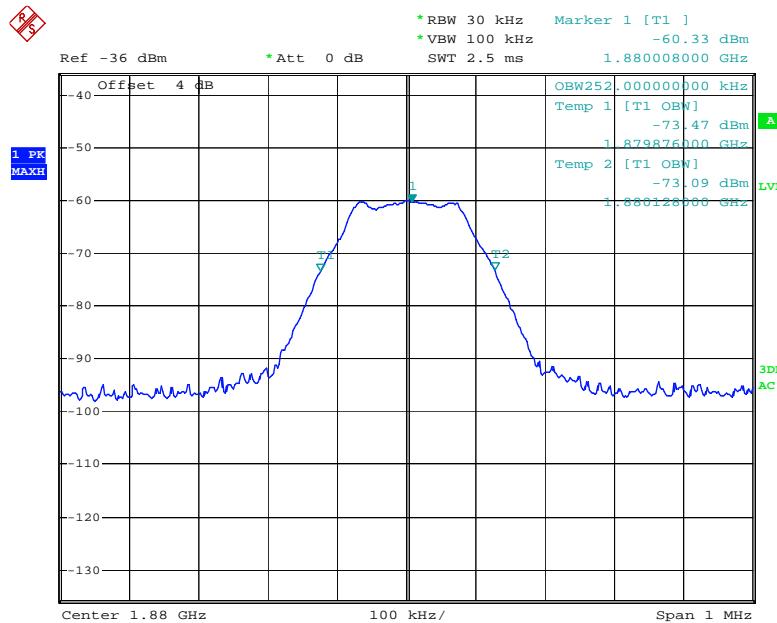
Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Uplink (1850-1910 MHz)			
Middle	1880.0	248.0	334.0
Downlink (1930-1990 MHz)			
Middle	1960.0	248.0	332.0

Note: Input signal level:-60 dBm for Uplink, -53d Bm for Downlink

Please refer to the following plots.

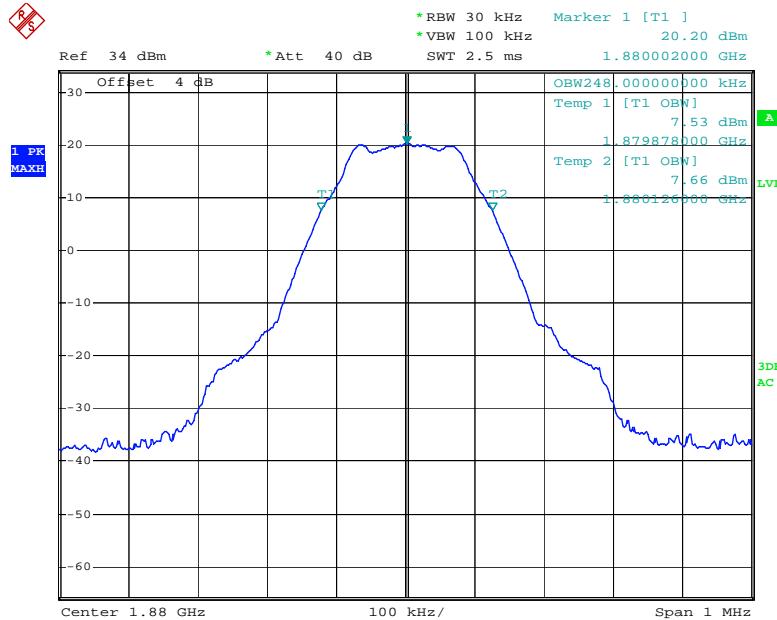
Uplink:

Input



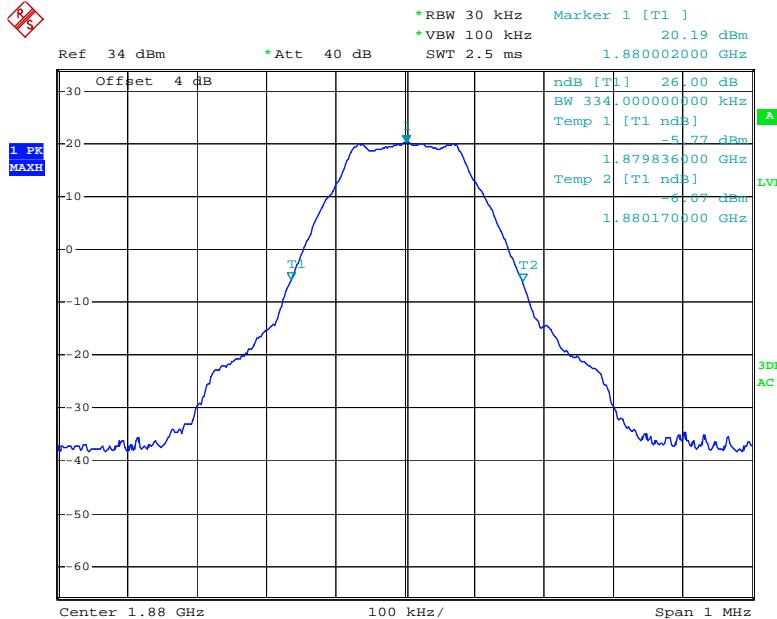
Date: 29.JUN.2010 16:43:23

99% Occupied Bandwidth, Middle Channel

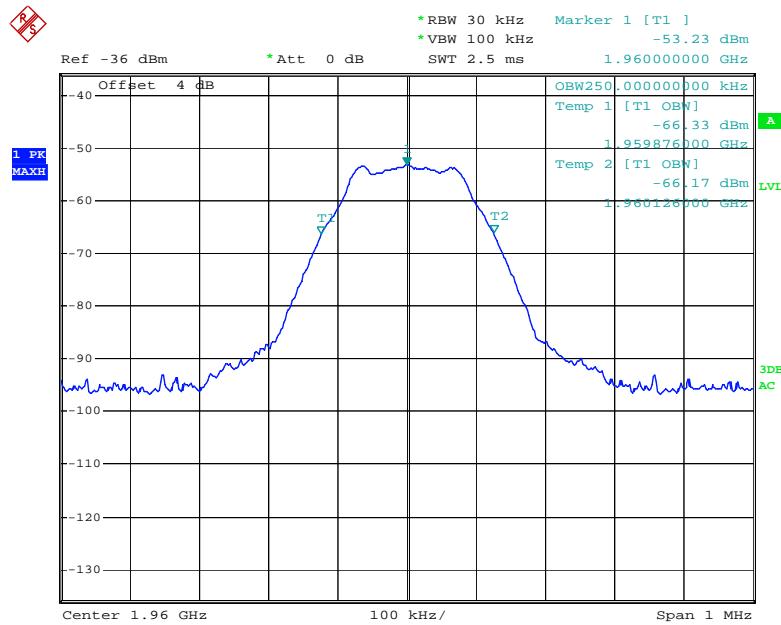


Date: 13.MAY.2010 13:43:31

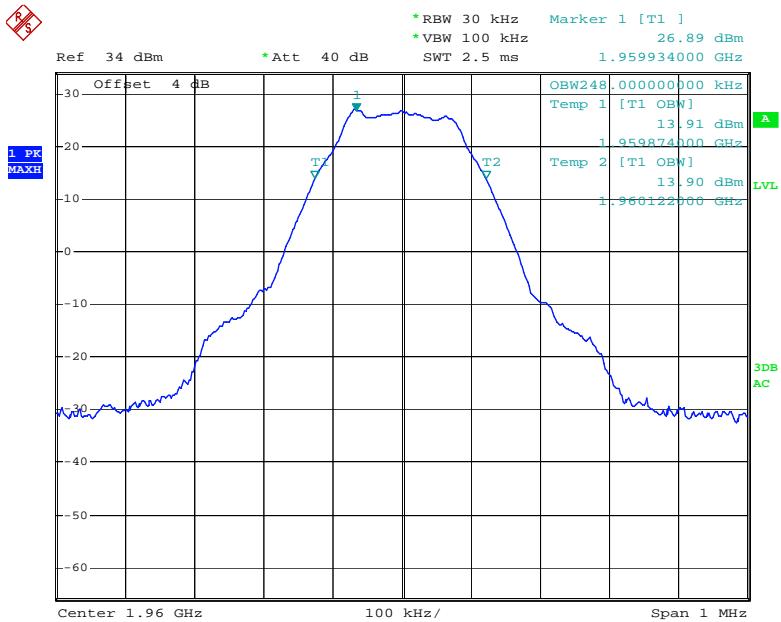
26 dB Occupied Bandwidth, Middle Channel



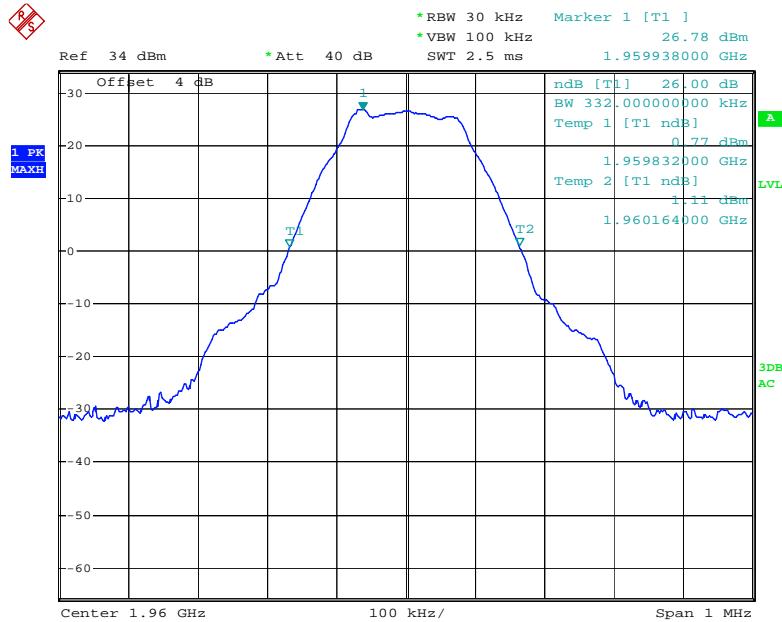
Date: 13.MAY.2010 13:43:55

Downlink:**Input**

Date: 29.JUN.2010 16:44:21

99% Occupied Bandwidth, Middle Channel

Date: 13.MAY.2010 13:35:51

26 dB Occupied Bandwidth, Middle Channel

Date: 13.MAY.2010 13:35:22

FCC §2.1051 & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

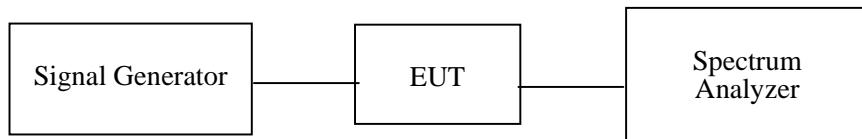
FCC §2.1051 and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in FCC §2.1051.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-07
Agilent	ESG-D Series Signal Generator	E4432B	MY45300749	2009-11-20	2010-11-20
Agilent	PSA Series Spectrum Analyzer	E4443A	GB40051703	2010-01-07	2011-01-07

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

Test Data

Environmental Conditions

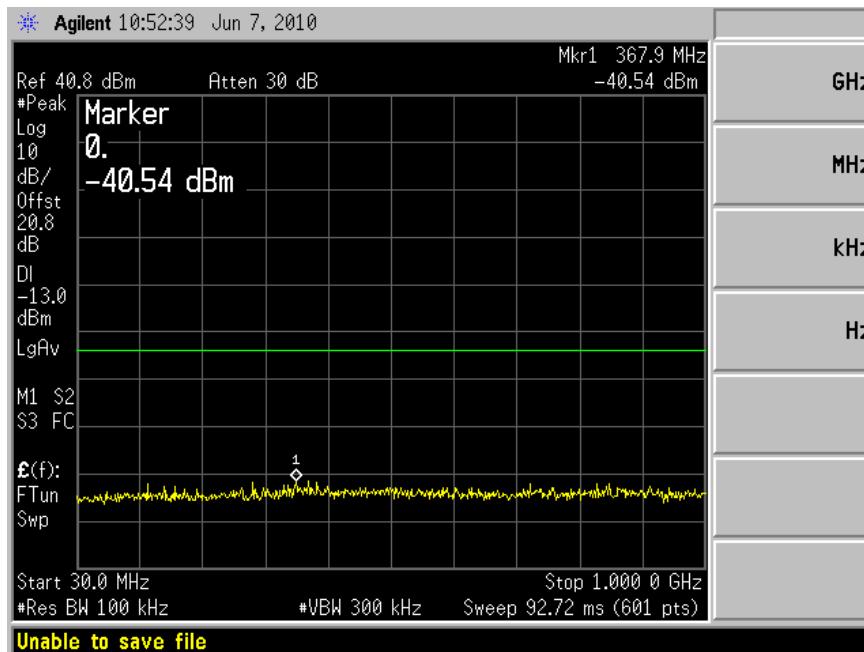
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Bruce Zhang on 2010-06-07 to 2010-06-13.

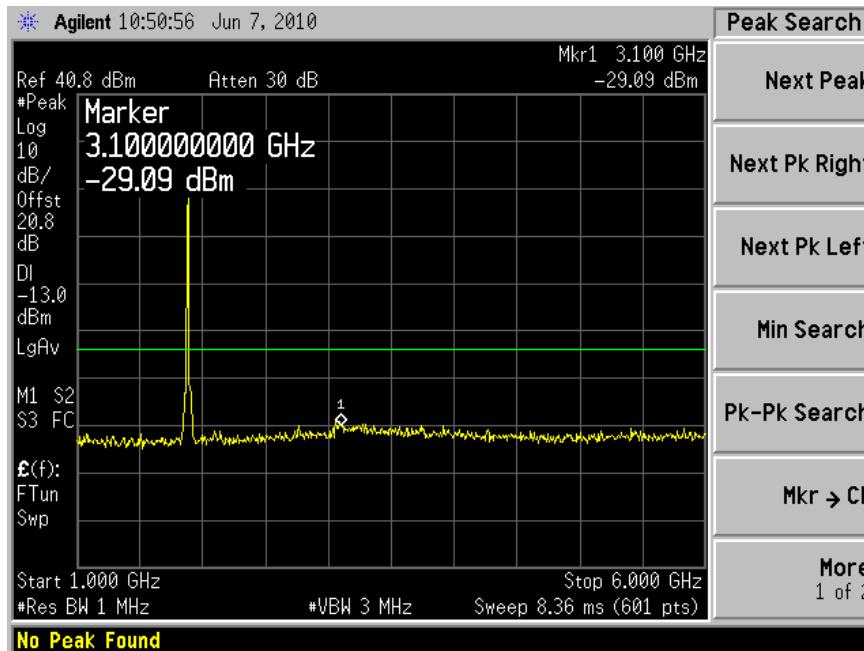
Please refer to the following plots.

Uplink:

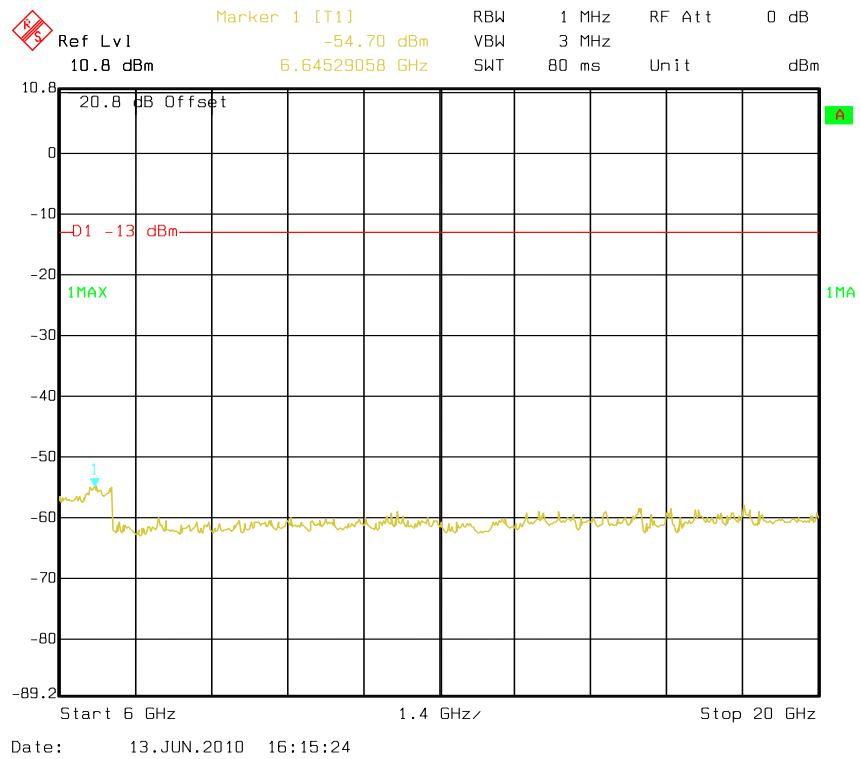
30 – 1000 MHz - Middle Channel



1 - 6 GHz - Middle Channel

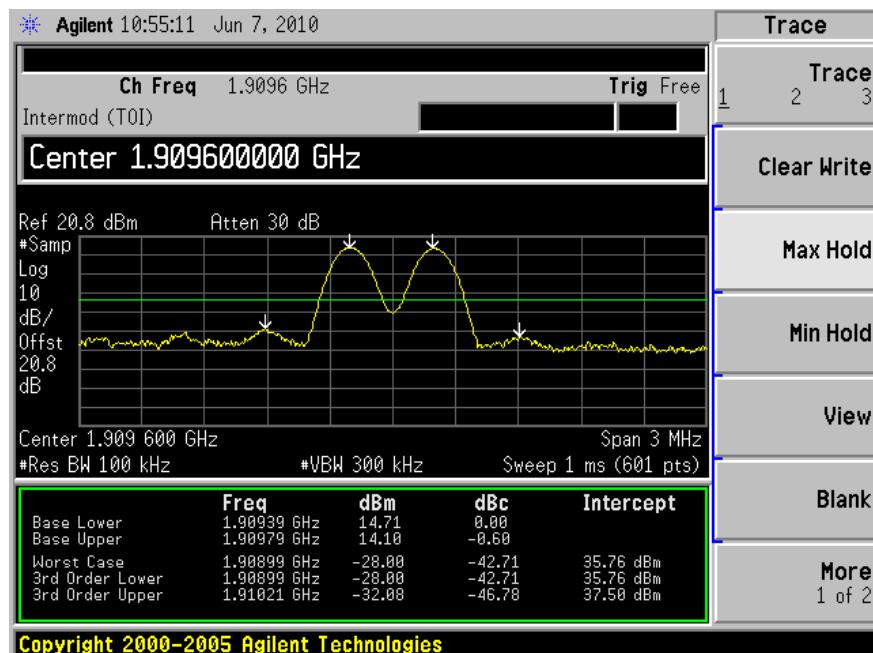
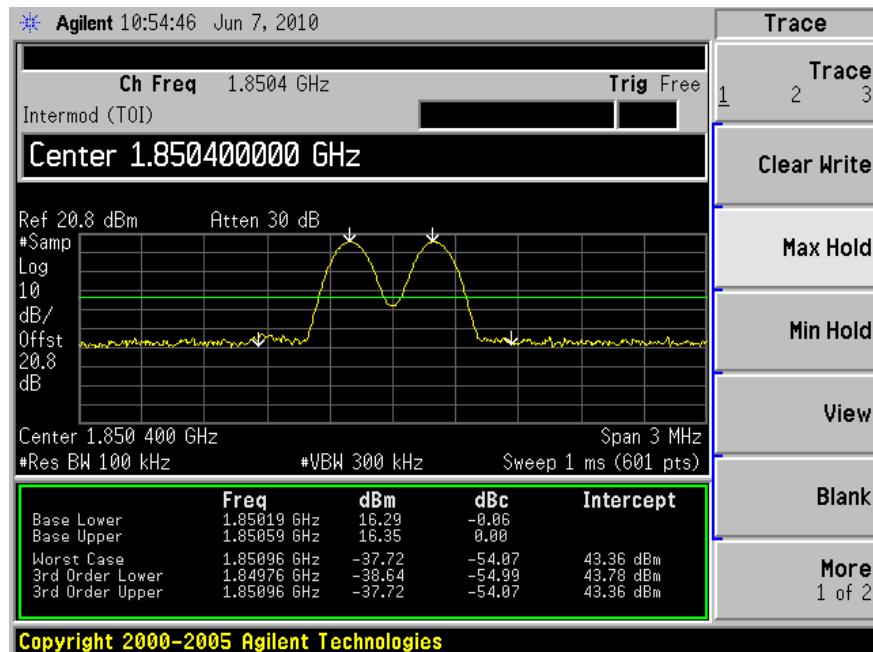


6 – 20 GHz - Middle Channel



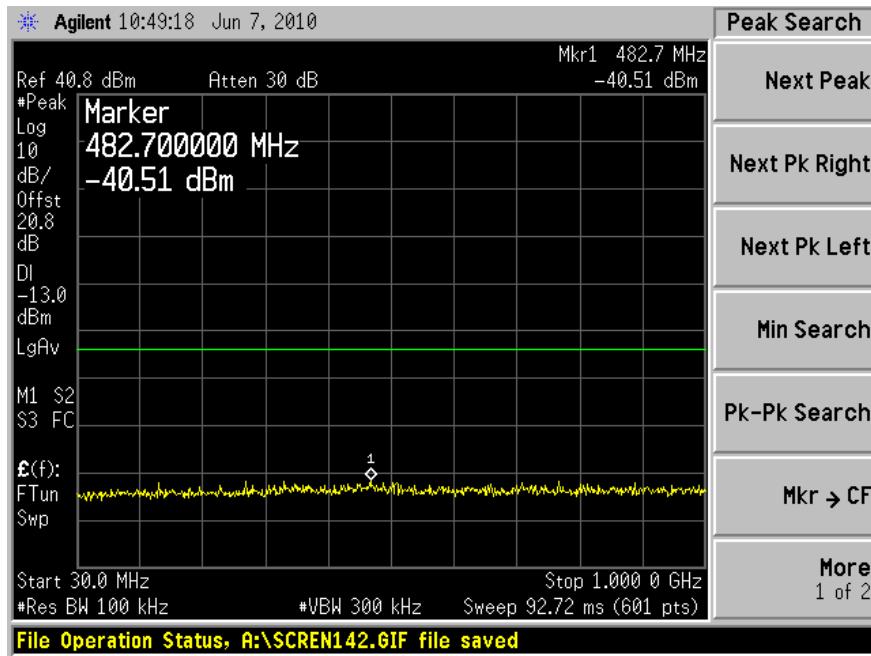
Inter-modulation

In the band 1850-1910 MHz, inter-modulation products levels as following and the max level are less than -13 dBm

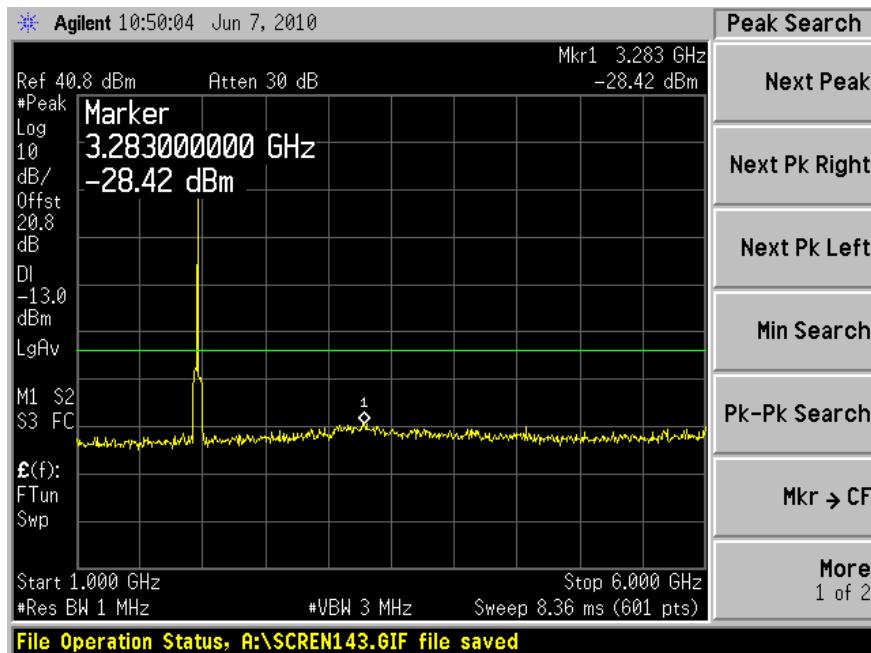


Downlink:

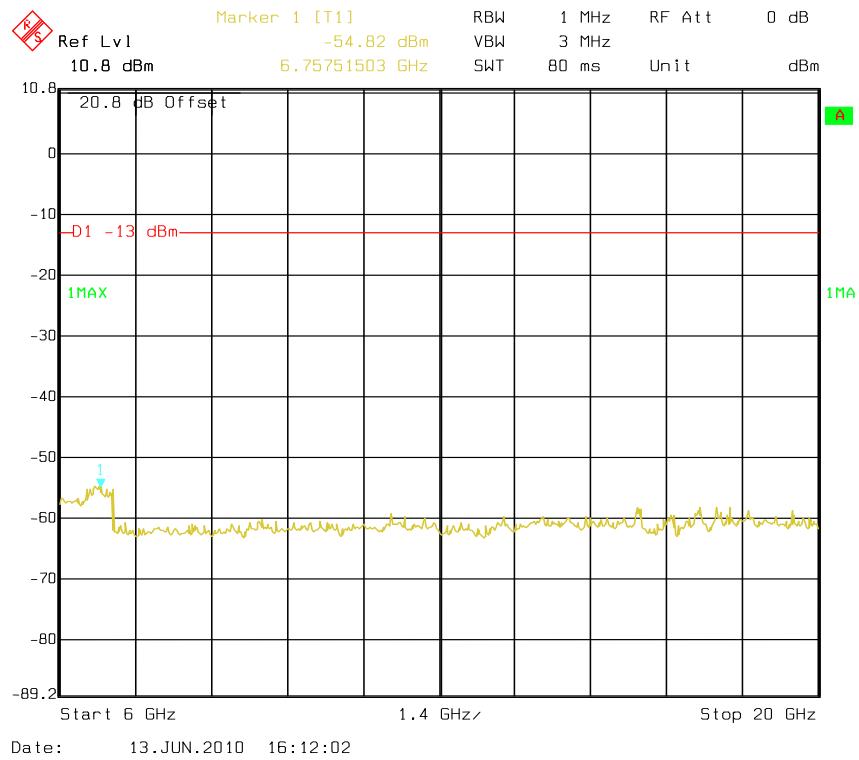
30 – 1000 MHz - Middle Channel



1 - 6 GHz - Middle Channel

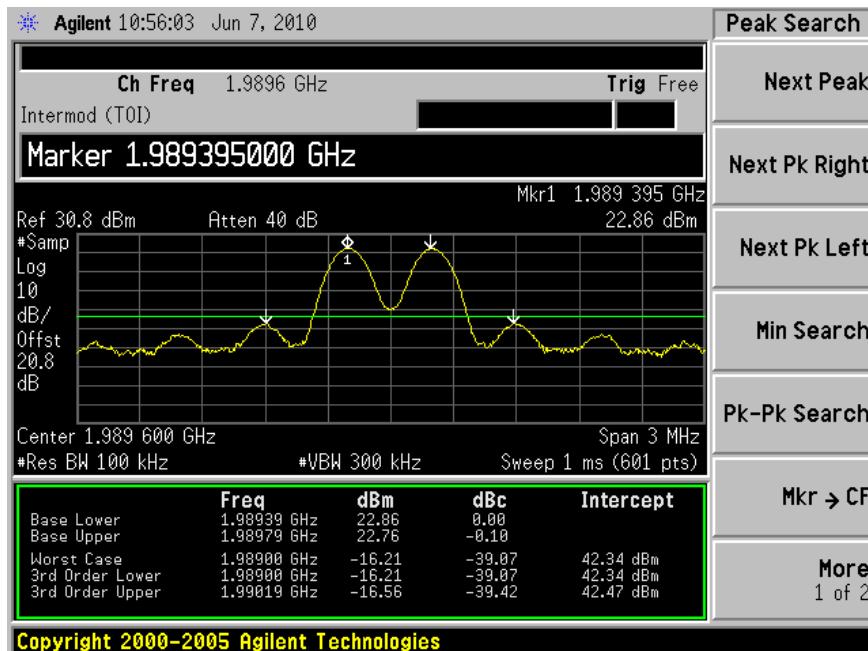
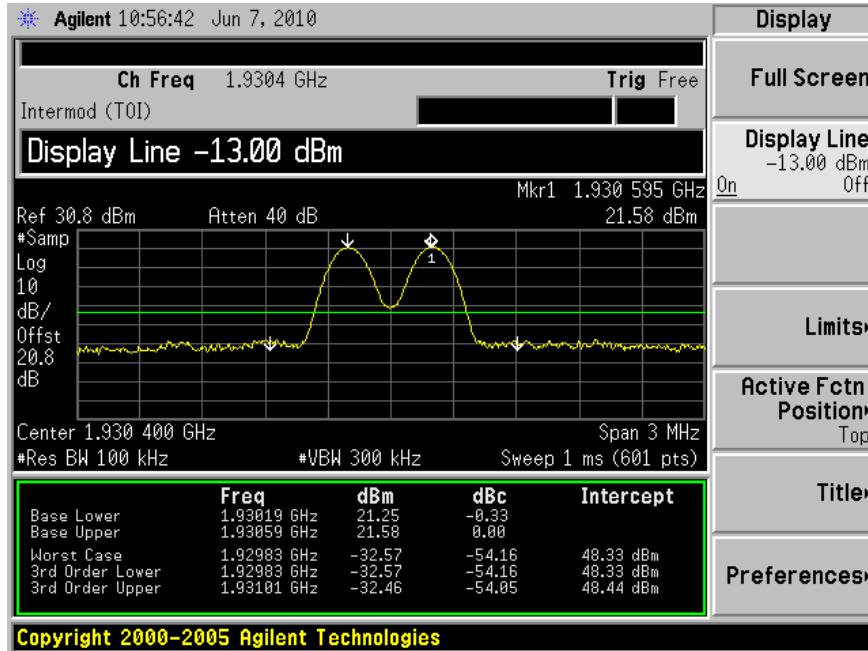


6 – 20 GHz - Middle Channel



Inter-modulation

In the band 1930-1990 MHz, inter-modulation products levels as following, and the max level are less than -13 dBm.



FCC §2.1053 & §24.238 - SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC §2.1053 and §24.238.

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level
Spurious attenuation limit in dB = $43 + 10 \log_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2010-05-05	2011-05-04
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-03-11	2011-03-11
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2009-07-08	2010-07-07
HP	Amplifier	2VA-213+	T-E27H	2010-03-08	2011-03-07
HP	Signal Generator	HP8657A	2849U00982	2009-10-28	2010-10-27
HP	Amplifier	HP8447D	2944A09795	2009-08-02	2010-08-02
HP	Synthesized Sweeper	8341B	2624A00116	2009-11-07	2010-11-06
COM POWER	Dipole Antenna	AD-100	041000	2009-09-25	2010-09-25
A.H. System	Horn Antenna	SAS-200/571	135	2010-05-17	2011-05-17

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

The testing was performed by Bruce Zhang on 2010-06-12.

Test mode: Transmitting

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dB μ V)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Uplink											
3760	38.34	180	1.8	V	3760	-55.2	6.7	1.50	-50	-13	37.00
1448.9	44.62	120	1.4	V	1448.9	-56.3	6.4	0.92	-50.82	-13	37.82
3760	37.53	185	2.0	H	3760	-56.4	6.7	1.50	-51.2	-13	38.20
2154.3	38.73	180	1.2	V	2154.3	-57.2	7.1	1.11	-51.21	-13	38.21
1448.9	43.28	178	1.5	H	1448.9	-57.1	6.4	0.92	-51.62	-13	38.62
2154.3	40.94	220	1.5	H	2154.3	-59.0	7.1	1.11	-53.01	-13	40.01
34.3	40.37	210	1.5	V	34.3	-53.3	0	0.24	-53.54	-13	40.54
33.5	32.66	180	1.0	H	33.5	-62.1	0	0.24	-62.34	-13	49.34
Downlink											
3920	39.42	220	2.0	V	3920	-54.2	6.7	1.53	-49.03	-13	36.03
1448.9	46.57	115	1.5	V	1448.9	-55.1	6.4	0.92	-49.62	-13	36.62
3920	38.51	170	1.8	H	3920	-55.4	6.7	1.53	-50.23	-13	37.23
2154.3	39.64	240	1.3	V	2154.3	-56.5	7.1	1.11	-50.51	-13	37.51
1448.9	43.71	182	1.5	H	1448.9	-56.3	6.4	0.92	-50.82	-13	37.82
2154.3	41.71	208	1.5	H	2154.3	-58.3	7.1	1.11	-52.31	-13	39.31
34.5	40.42	210	1.5	V	34.5	-53.3	0	0.24	-53.54	-13	40.54
33.2	32.31	180	1.0	H	33.2	-62.2	0	0.24	-62.44	-13	49.44

FCC §24.238(a) - BAND EDGES

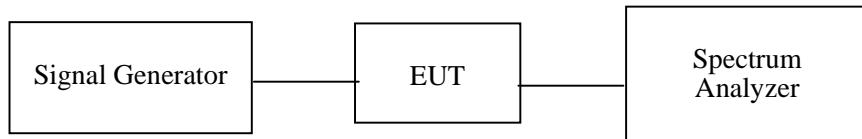
Applicable Standards

According to FCC §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 3 kHz.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	ESG-D Series Signal Generator	E4432B	GB40051703	2009-11-20	2010-11-20
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2009-11-24	2010-11-23

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

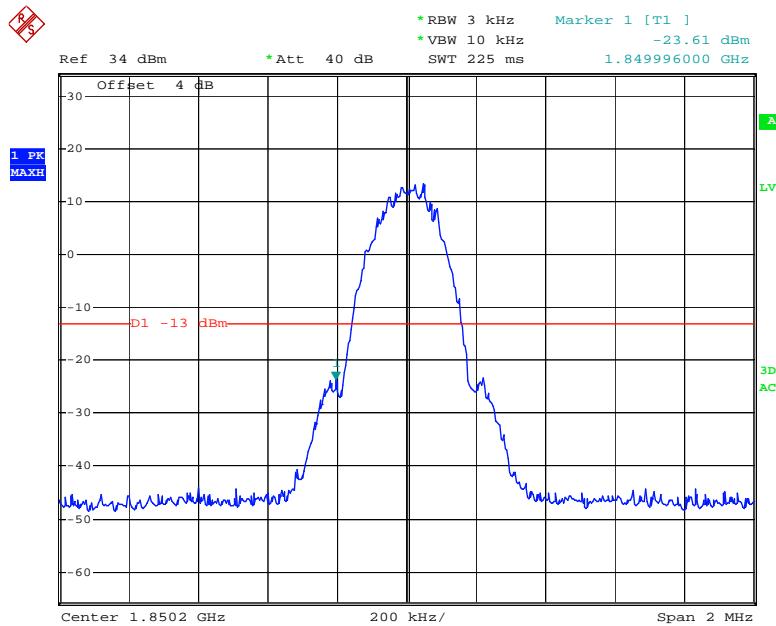
The testing was performed by Bruce Zhang on 2010-05-13.

Frequency Band	Frequency (MHz)	Emission (dBm)	Limit (dBm)
Uplink	1849.996	-23.61	-13
	1910.020	-24.73	-13
Downlink	1929.988	-19.77	-13
	1990.024	-17.00	-13

Please refer to the following tables and plots.

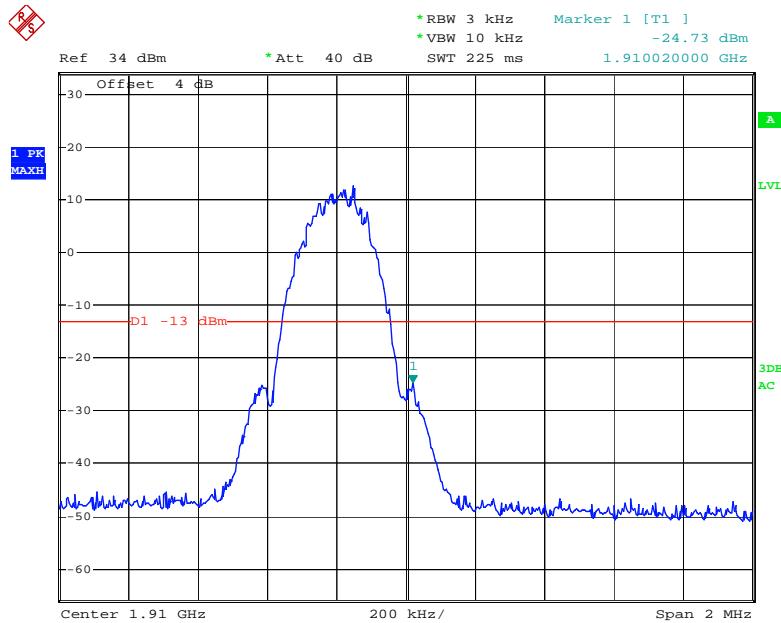
Uplink:

Lowest Channel



Date: 13.MAY.2010 13:47:49

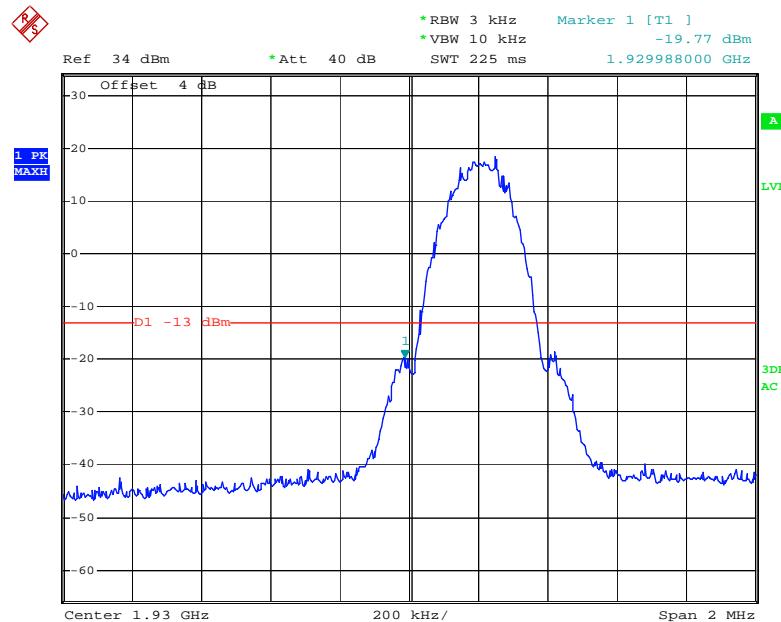
Highest Channel



Date: 13.MAY.2010 13:46:50

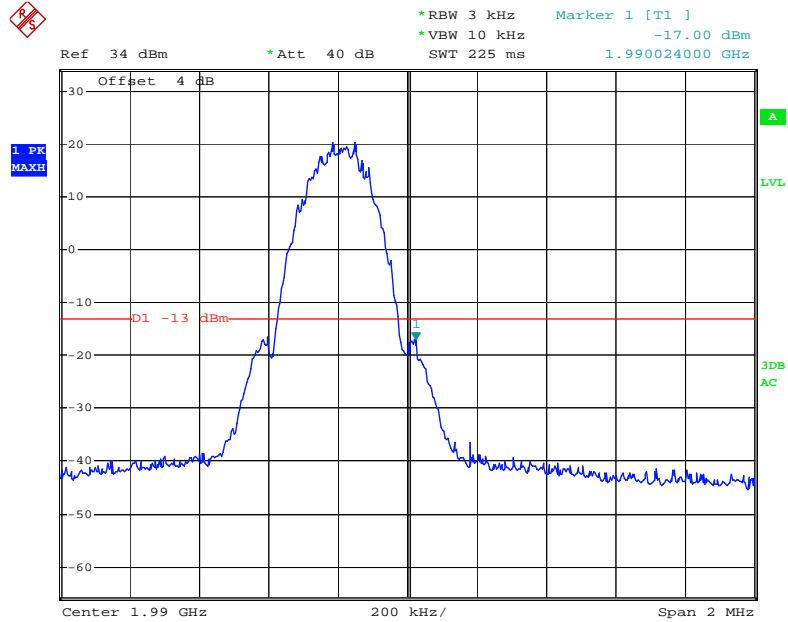
Downlink:

Lowest Channel



Date: 13.MAY.2010 13:29:43

Highest Channel



Date: 13.MAY.2010 13:32:05

***** END OF REPORT *****