

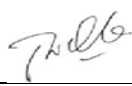
FCC PART 24 TYPE APPROVAL EMI MEASUREMENT AND TEST REPORT

For

NuVision Technology Co., Ltd

1F, No. 8, Lane 345, Yangguang St.,
Neihu, Taipei 114, Taiwan

FCC ID: TCYFP-2128

This Report Concerns: ☒ Original Report	Equipment Type: 1900MHz GSM Cell Phone
Test Engineer: Daniel Deng / 	
Report No.: R0503293	
Report Date: 2005-06-03	
Reviewed By: Richard Lee / 	
Prepared By: Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164	

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The NuVSION Technology Co., Ltd's product, FCC ID: TCYFP-2128 or the "EUT" as referred to in this report is a 1900MHz GSM Cell Phone. The EUT measures approximately 90mmL x 45mmW x 25mmH.

** The test data gathered are from production sample, serial number: 2126051009620, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of NuVSION Technology Co., Ltd 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, spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

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 - PCS

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4-2003, and TIA/EIA-603A.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters, except as noted below.

Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Article 8 of the VCCI regulations. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations is attached hereinafter and can also be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

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

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

Block Diagram

Please refer to Exhibit D.

Equipment Modifications

No modifications were made to the EUT.

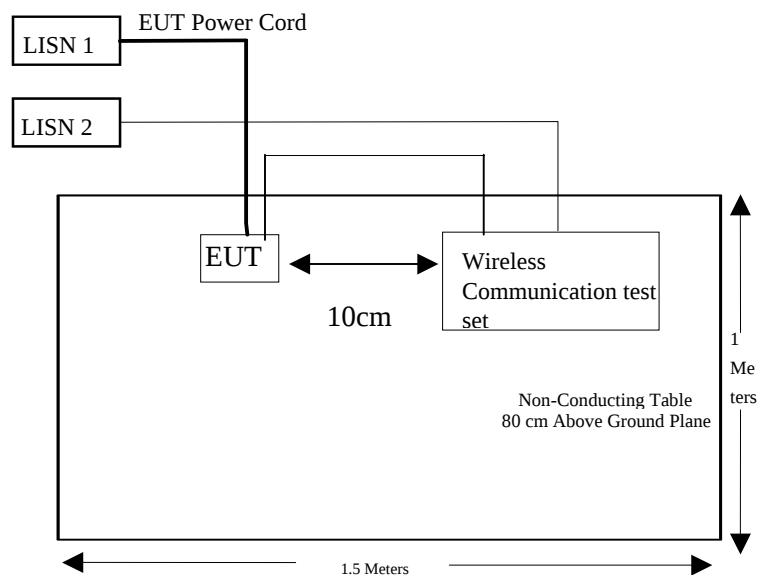
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Agilent	Wireless communication test set	8960	GB44051221	DOC

External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
RF cable	1.5	Wireless Communication Test Set	RF Port / EUT

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC RULE	DESCRIPTION OF TEST	RESULT
§ 2.1047	Modulation Characteristics	Compliant
§ 2.1053	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	SAR Report
§ 15.107	Conducted Emissions	N/A
§ 2.1046, § 24.232	RF Output Power	Compliant
§ 2.1046, § 24.232	Conducted Output Power	N/A
§ 2.1055 (a) § 2.1055 (d) § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§ 2.1049 § 24.238	Out of Band Emission, Occupied Bandwidth	Compliant
§ 2.1051, § 24.238(a)	Spurious Emissions at Antenna Terminals	Compliant
§24.238	Band Edge	Compliant

§2.1047 - MODULATION CHARACTERISTIC

Applicable Standard

Requirement: FCC § 2.1047.

Test Procedure

GSM digital mode is used by EUT.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2004-10-04
HP	Plotter	HP7470A	2541A49659	N/R
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05

* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

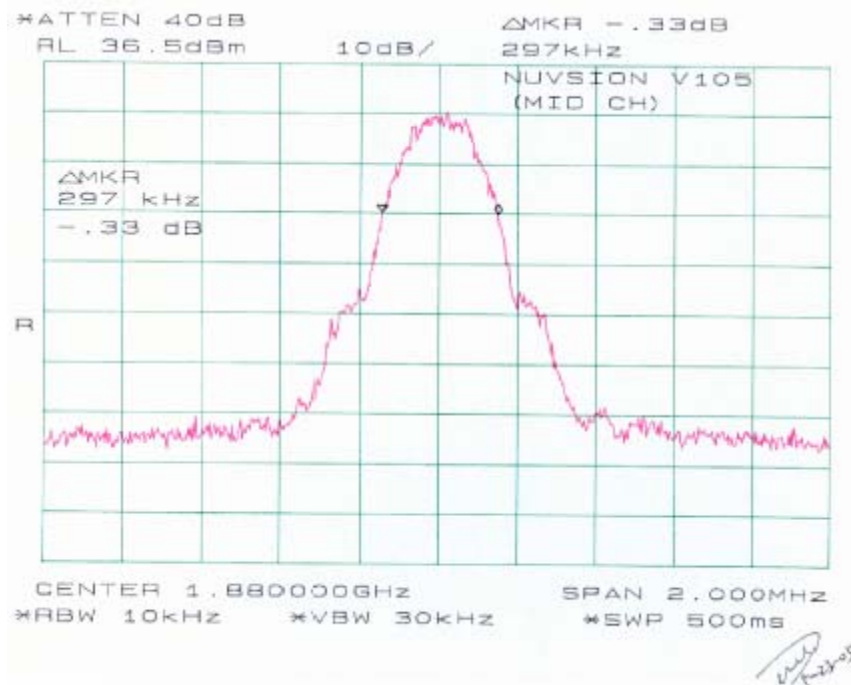
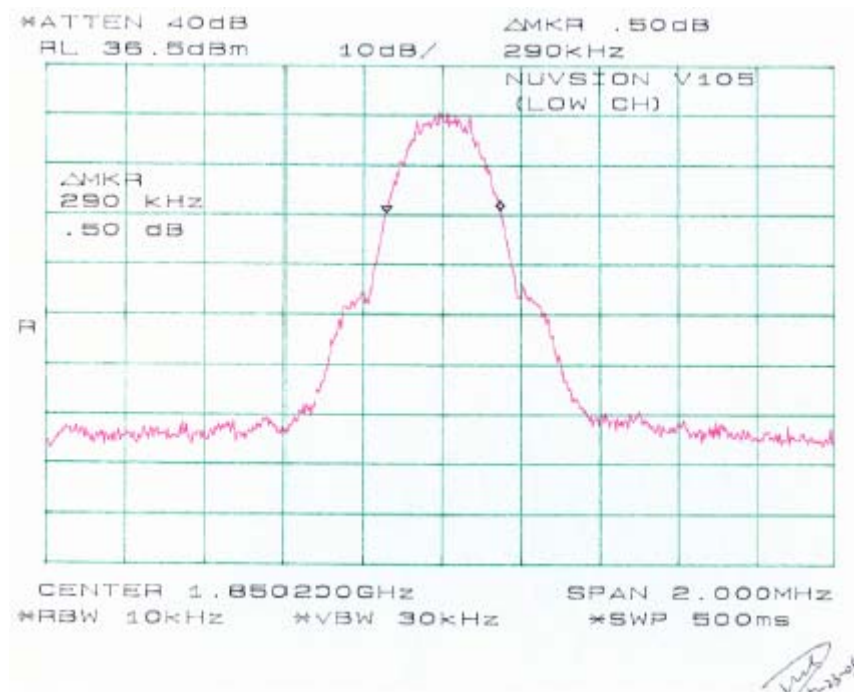
Environmental Conditions

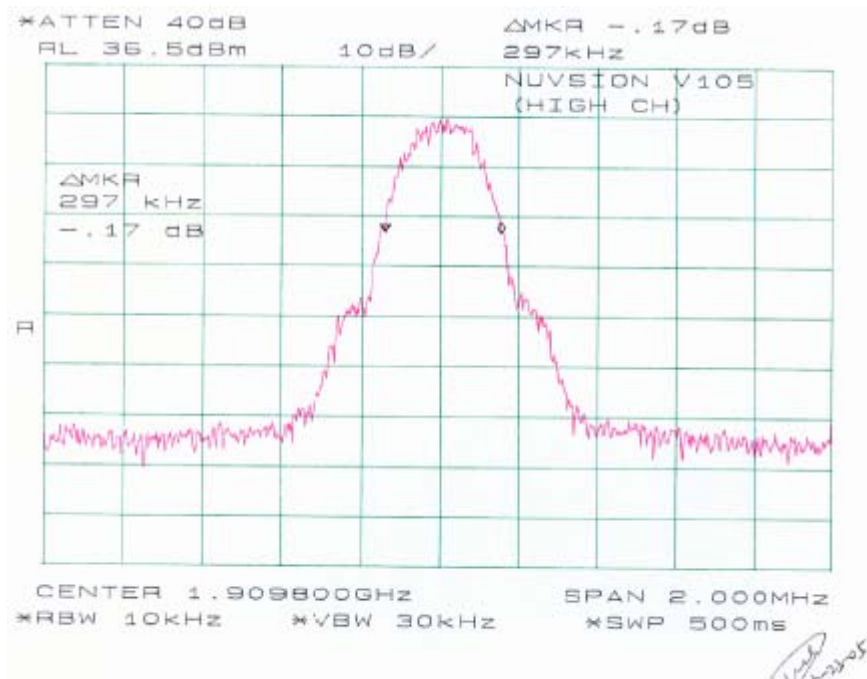
Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

* *The testing was performed by Daniel Deng on 2005-05-23.*

Test Results

Please refer to the hereinafter plots.





§2.1053 - SPURIOUS RADIATED EMISSION

Applicable Standards

Requirements: CFR 47, § 2.1053, and § 24.238 (a).

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 = $43 + 10 \text{ Log}_{10} (\text{power out in Watts})$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	E4446A	US44051221	2004-11-10
ETS	Log Periodic Antenna	3148	4-1155	2004-12-14
ETS	Biconical Antenna	3110B	9603-2315	2004-12-14
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2005-05-02
Com-Power	Dipole Antenna	AD-100	2222	2004-09-26
AH System	Horn Antenna	SAS-200/571	261	2005-04-20
Sunol Sciences	Antenna	DRH-118	A052704	2004-06-02
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2004-04-05

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

** The testing was performed by Daniel Deng on 2005-05-23.*

Test Result

Worst case reading: 13.66dB at 3760 MHz, vertical polarization.

Primary scan 30MHz -20GHz , Middle Channel, Normal voltage

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Correction	Loss dB	Level dBm	dBm	dB
1880	94.83	0	1.7	v	1880	23.2	8.32	1.9	29.62		
1880	92.56	180	2.1	h	1880	21.1	8.32	1.9	27.52		
3760	43.57	180	1.6	v	3760	-34.6	11.44	3.5	-26.66	-13	-13.66
7520	40.33	150	1.8	h	7520	-32.7	11.14	5.6	-27.16	-13	-14.16
7520	34.61	150	1.6	v	7520	-38.4	11.14	5.6	-32.86	-13	-19.86
3760	36.76	180	2.3	h	3760	-42.5	11.44	3.5	-34.56	-13	-21.56
2068	28.03	0	1.8	v	2068	-46.9	7.57	2	-41.33	-13	-28.33
2068	27.72	180	1.6	h	2068	-47.3	7.57	2	-41.73	-13	-28.73
5640	20.83	90	1.7	h	5640	-52.2	11.22	4.3	-45.28	-13	-32.28
5640	20.27	120	1.7	v	5640	-52.9	11.22	4.3	-45.98	-13	-32.98

§2.1046 & §24.232 - RF POWER OUTPUT

Applicable Standard

According to FCC §2.1046 and §24.232 (b), mobile stations are limited to 2 watts eirp peak power.

Test Procedure

The antenna was removed and SMA connector was connected to the transmitter output. The transmitter output was connected to a calibrated coaxial attenuator (50 Ohm), the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter was determined by adding the value of the attenuator to the power meter reading.

The test was performed at three frequencies (low, middle, and high channels) and on all power levels which can be setup on the transmitter.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	E4446A	US44051221	2004-11-10
ETS	Log Periodic Antenna	3148	4-1155	2004-12-14
ETS	Biconical Antenna	3110B	9603-2315	2004-12-14
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2005-05-02
Com-Power	Dipole Antenna	AD-100	2222	2004-09-26
AH System	Horn Antenna	SAS-200/571	261	2005-04-20
Sunol Sciences	Antenna	DRH-118	A052704	2004-06-02
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2004-04-05

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

* The testing was performed by Daniel Deng on 2005-05-23.

Test Results

Substituted		Antenna Gain Correction	Cable Loss dB	Absolute Level dBm
Frequency MHz	Level dBm			
1880	23.2			
		8.32	1.9	29.62

§2.1046 & §24.232 – CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §24.232 (c), in no case may the peak output power of a base station transmitter exceed 2 watt.

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2004-10-04
HP	Plotter	HP7470A	2541A49659	N/R
Agilent	Spectrum Analyzer	E4446A	US44051221	2004-11-10
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05

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Environmental Conditions

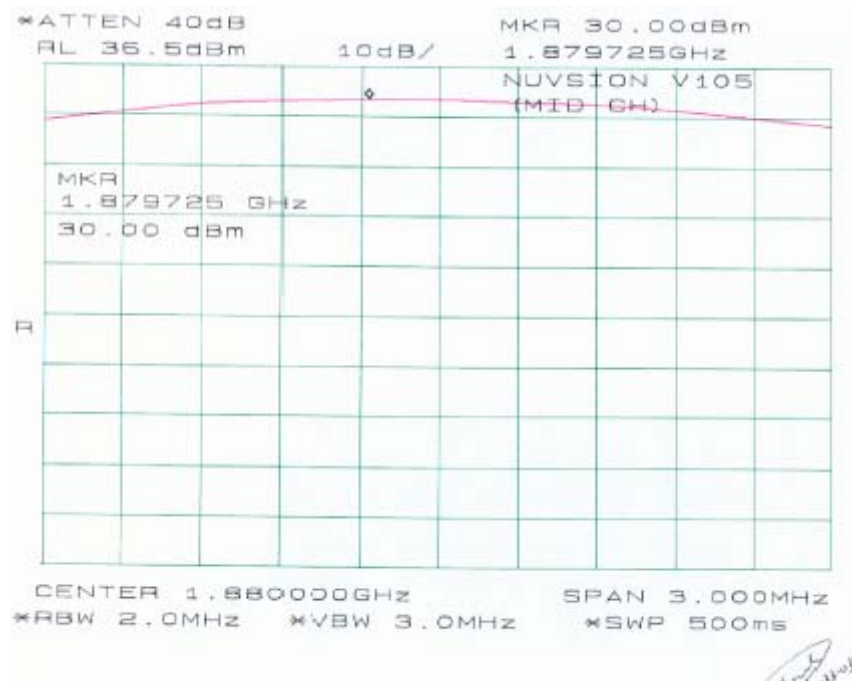
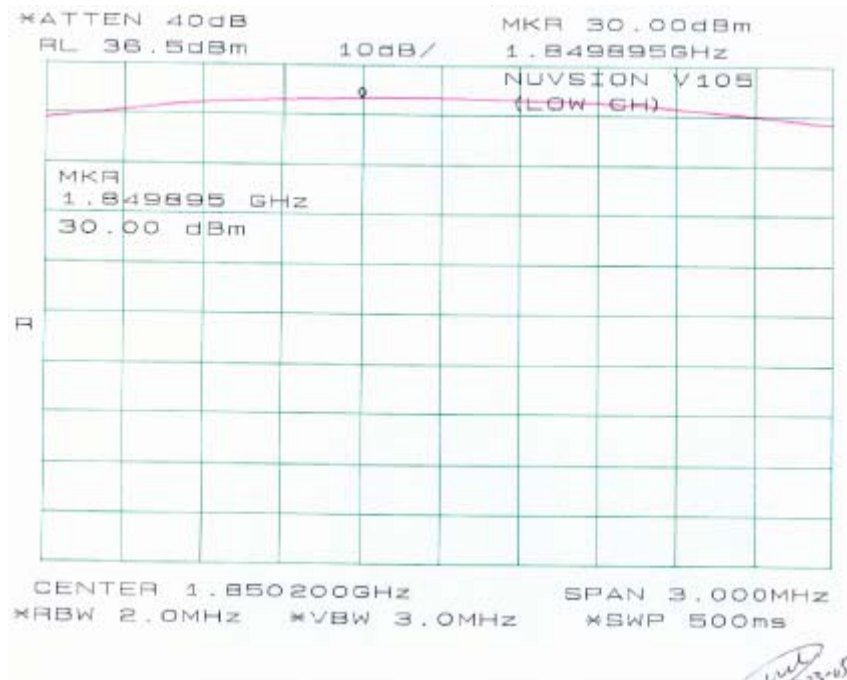
Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

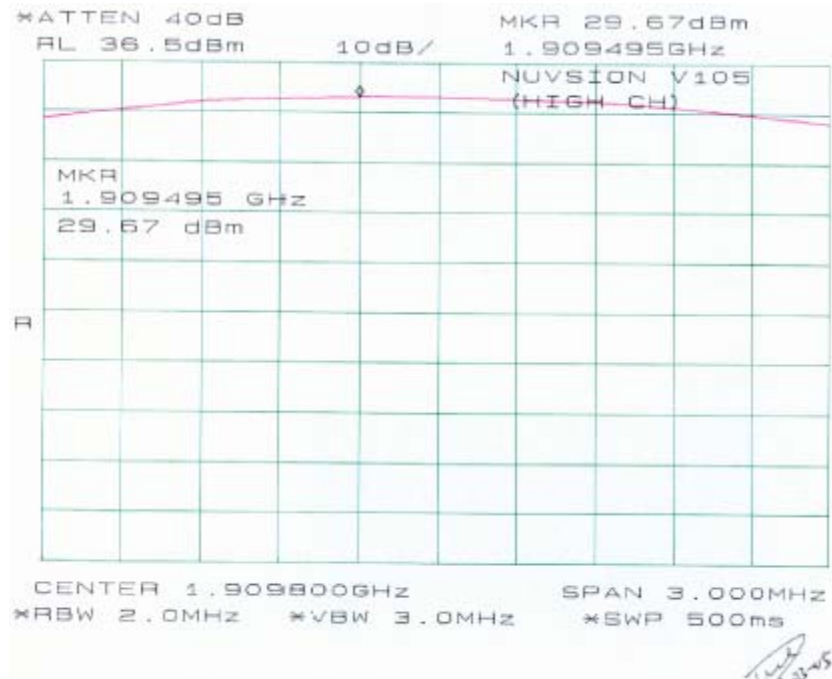
* *The testing was performed by Daniel Deng on 2005-05-23.*

Test Results

Channel	Frequency	Output Power		Limit
	MHz	dBm	W	W
Low	1850.20	30.00	1.000	2
Mid	1880.00	30.00	1.000	2
High	1909.80	29.67	0.927	2

Please refer to the plots hereinafter.





§2.1055(a), §2.1055(d) & §24.235 – FREQUENCY STABILITY

Applicable Standard

Requirements: FCC § 2.1055 (a), § 2.1055 (d) and § 24.235

The Frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The power leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Counter, Microwave Frequency	5342A	2232A06380	2004-09-07
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05
Tenney	Oven, Temperature	Versa Tenn	1.2222-193	2004-06-04
HP	DC Power Supply	6236B	2003A05705	2004-08-05

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Environmental Conditions

Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

* *The testing was performed by Daniel Deng on 2005-05-23.*

Test Results**GSM 1900 PCS Band***Frequency Stability Versus Temperature*

Reference Frequency: 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MHz	PPM Error
50	3.7	1879.99989	-0.06
40	3.7	1879.99991	-0.05
30	3.7	1879.99996	-0.02
20	3.7	1879.99994	-0.03
10	3.7	1879.99995	-0.03
0	3.7	1880.00009	0.05
-10	3.7	1880.00007	0.04
-20	3.7	1880.00016	0.09
-30	3.7	1880.00029	0.15

Frequency Stability Versus Battery Voltage

Reference Frequency: 1880MHz, Limit: 2.5ppm			
Power Supplied (Vdc)	Environment Temperature (°C)	MHz	ppm
3.45	20	1879.99995	-0.03

Note: Battery normal operating voltage: 3.7 Vdc
 Battery end point: 3.45 Vdc.

§2.1049 & §24.238 - OCCUPIED BANDWIDTH

Applicable Standard

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917 and Section 24.238.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the 26 dB bandwidth was recorded.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	E4446A	US44300386	2004-11-10
HP	Plotter	HP7470A	2541A49659	N/R
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05

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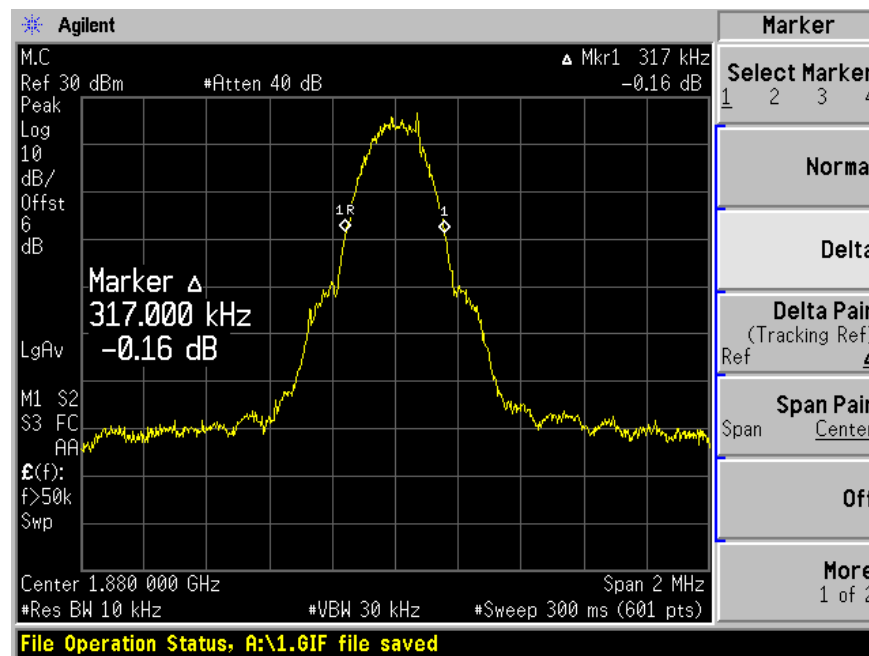
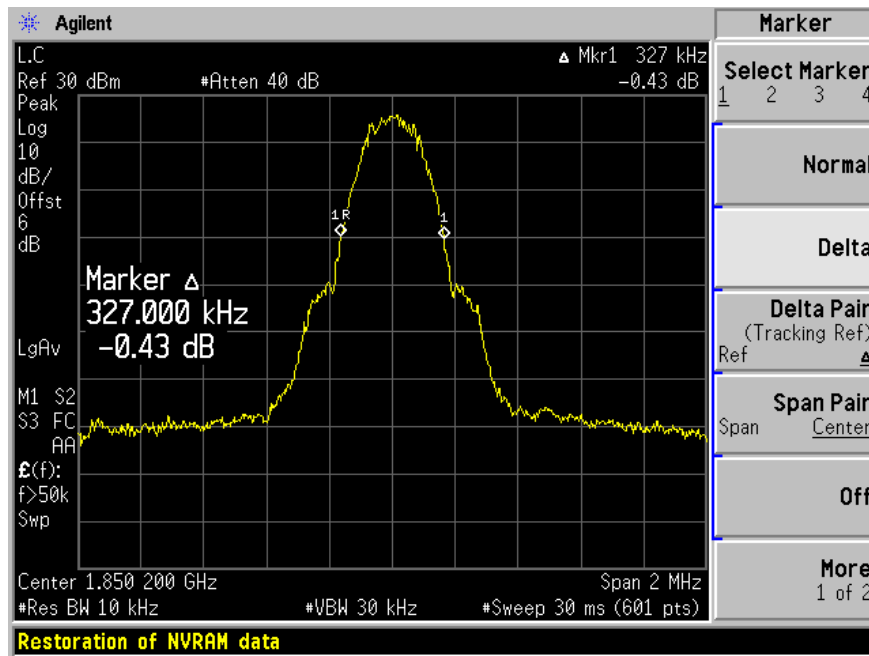
Environmental Conditions

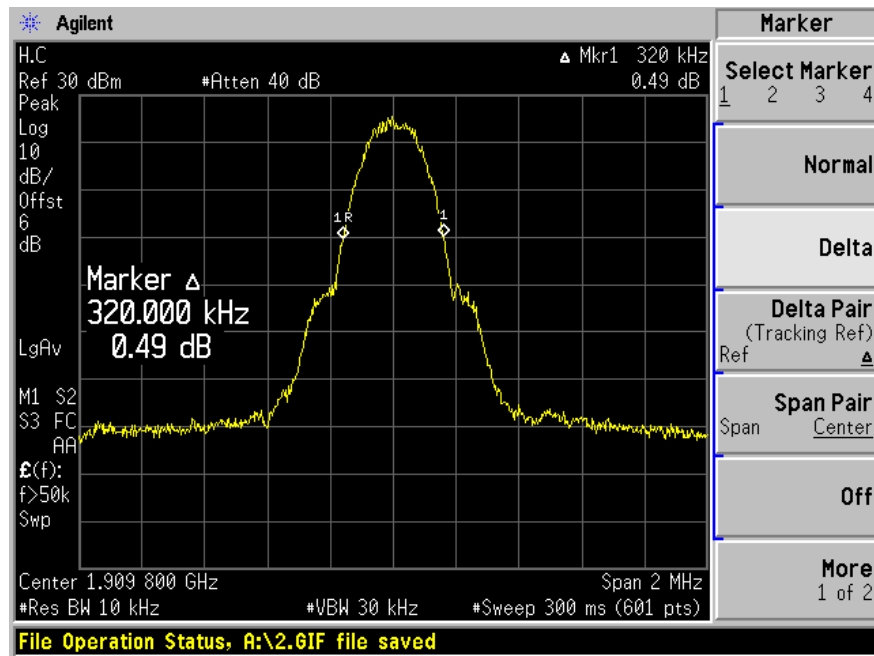
Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

* *The testing was performed by Daniel Deng on 2005-05-23.*

Test Results

Please refer to plots hereinafter.





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

Applicable Standards

According to FCC §2.1049 and §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer 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	Cal. Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2004-10-04
HP	Plotter	HP7470A	2541A49659	N/R
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05

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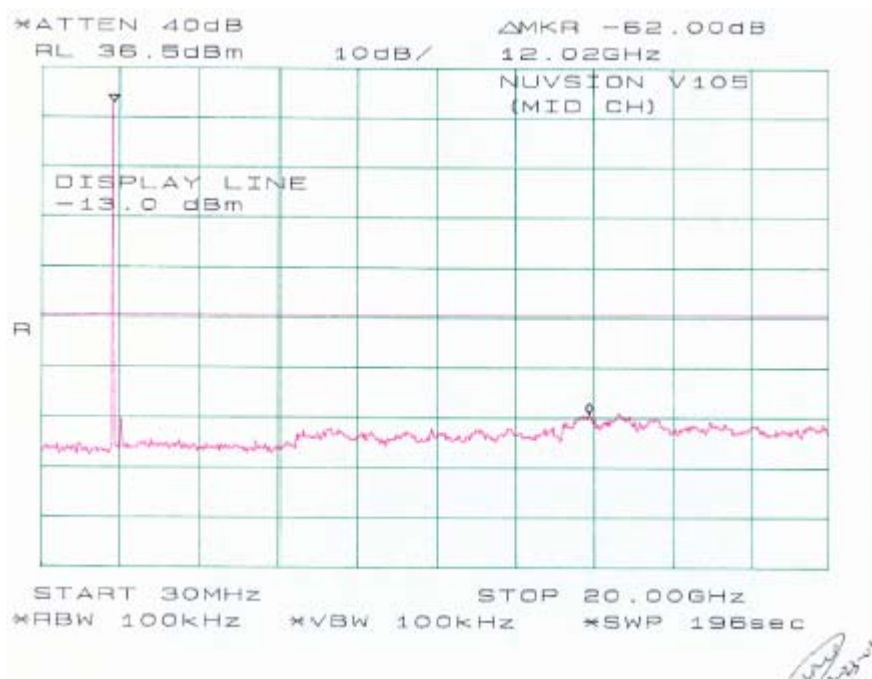
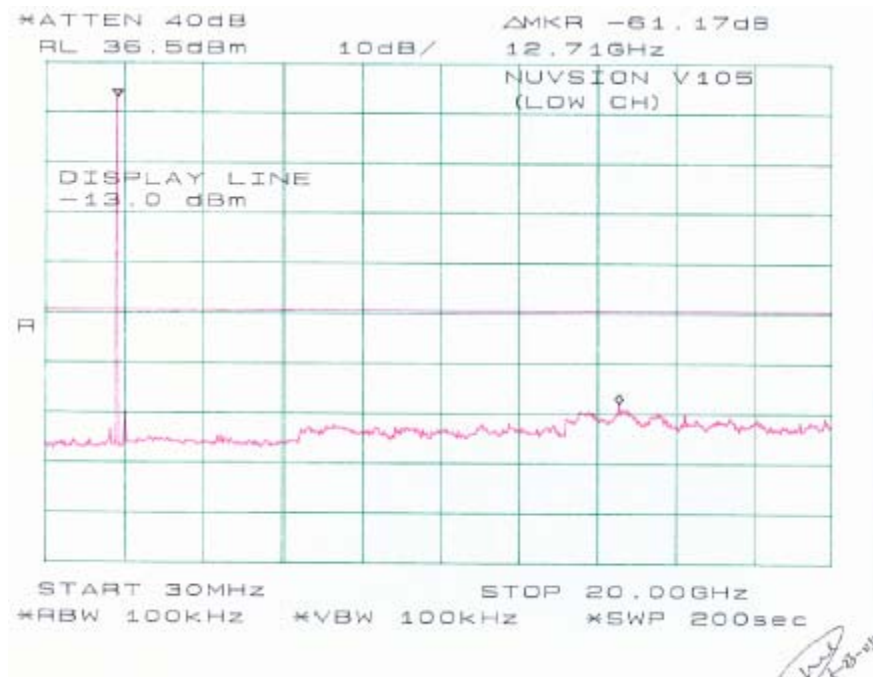
Environmental Conditions

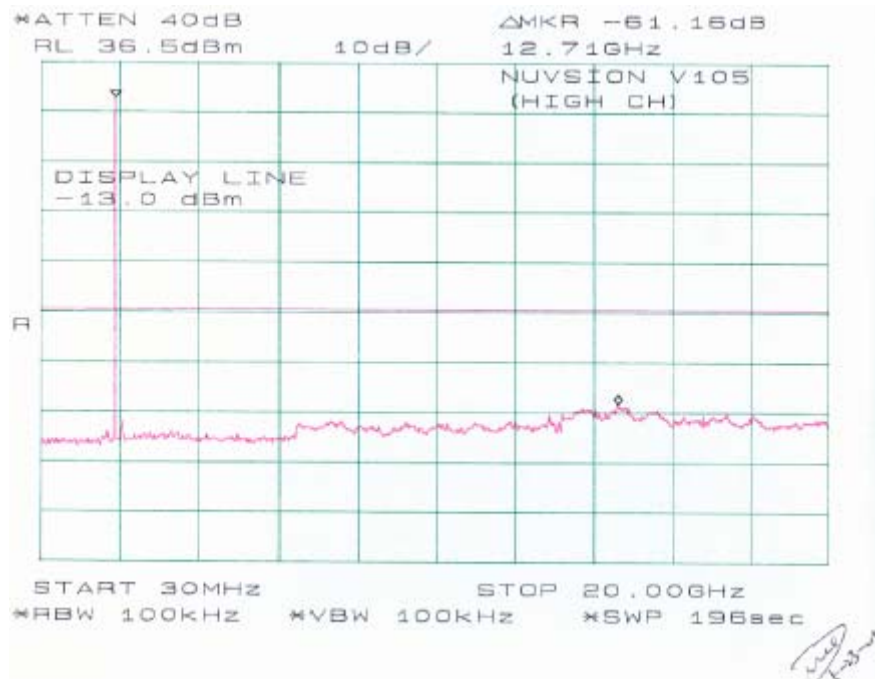
Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

** The testing was performed by Daniel Deng on 2005-05-23.*

Test Results

Please refer to the hereinafter plots.





§24.238 – BAND EDGE

Applicable Standards

According to FCC §2.1049 and §24.238, when measuring the emission limits, carrier frequency shall be adjusted as close to the frequency block edges, both upper and lower.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Adjust the carrier frequency as close to the frequency block edges both upper and lower. Sufficient scans were taken to show any out of band-edge emission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	8564E	3943A01781	2004-10-04
HP	Plotter	HP7470A	2541A49659	N/R
Agilent	Wireless Communication Test Set	E5515C	GB44051221	2005-04-05

* **Statement of Traceability:** **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	22° C
Relative Humidity:	40%
ATM Pressure:	1018 mbar

* *The testing was performed by Daniel Deng on 2005-05-23.*

Test Results

Please refer to plots hereinafter.

