


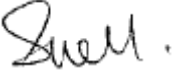
FCC PART 24 TYPE APPROVAL EMI MEASUREMENT AND TEST REPORT

For

Novatel Wireless Technologies Ltd.

Suite 200, 6715 – 8th Street N.E.
Calgary, Alberta
Canada, T2E 7H7

FCC ID: NBZNRM-U630

This Report Concerns: <input checked="" type="checkbox"/> Class II Permissive Change Report	Equipment Type: Transmitter, Portable
Test Engineer: Daniel Deng / 	
Report No.: R0511221	
Report Date: 2005-12-02	
Reviewed By: Snell Leong/ 	
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Note: The test report is specially limited to the above company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. 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 *Novatel Wireless Technologies Ltd.* product, FCC ID: NBZNRM-U630 or the "EUT" as referred to in this report is a Transmitter, Portable, which measures approximately 120mm(L) x 53mm(W) x 8mm(H). The EUT operates at the frequency of 1850.2 – 1909.8 MHz, maximum output power (ERP) 29.2dBm (0.832W), frequency tolerance 0.054ppm and emission designator 253KGXW.

** The test data gathered are from typical production sample, serial number: Novatel0804, provided by the manufacturer.*

Objective

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

This is a class II permissive change report. The only different which compares with previous test item is an internal antenna. Due the change describes above, Middle Channel Spurious Emission was retested. The detail information please refers to R0408161.

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

Related Submittal(s)/Grant(s)

Detail information please refers to R0408161. The original was granted on 2004-09-27.

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-603C.

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 Open Area Test site used by BACL Corp. 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 with registration number: 90464.

Test site at BACL Corp. 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 radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

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 scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997, Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

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
Dell	Notebook	Latitude	CIF0B00227	DOC
Agilent	Analyzer, Communications	E5515C	GB44051221	DOC

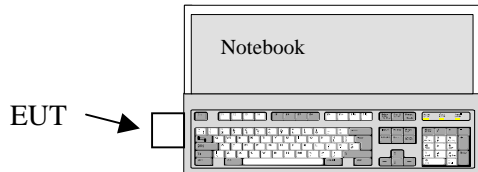
External Cables List and Details

Cable Description	Length (M)	From	To
RF Cable	1.5	E5515C	Antenna

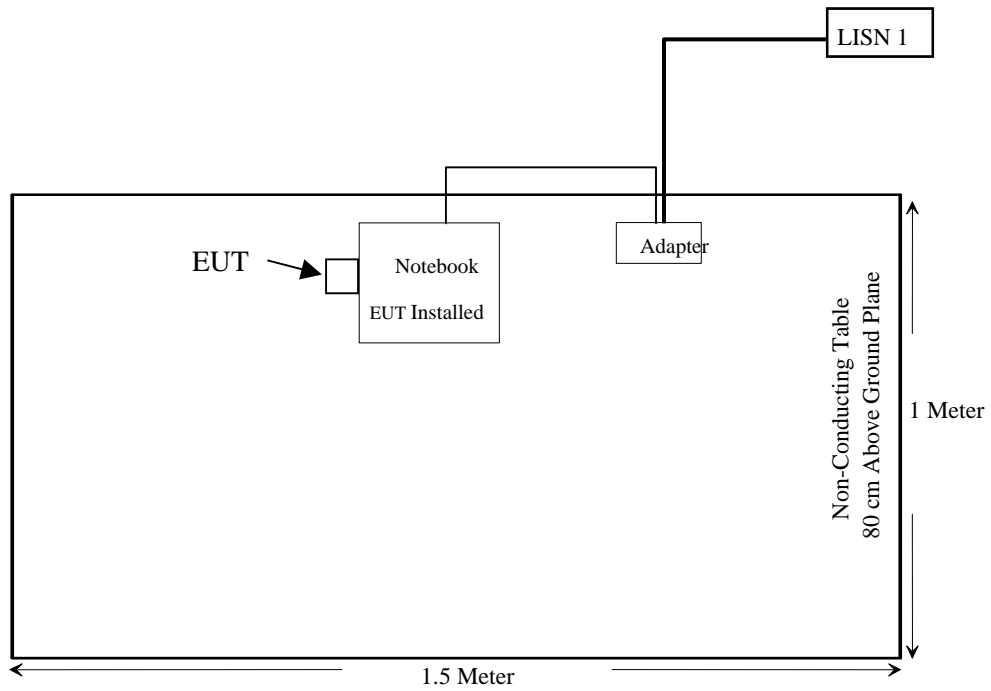
Power Supply Information

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	AC adapter	AA20031	CN-09364U-16291-13J-0E3F	DOC

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: *Novatel0804*.

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

§2.1053 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

Requirements: CFR 47, § 2.1053.

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 (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log₁₀ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2005-07-03
HP	Amplifier	8447E	2944A10187	2005-09-23
HP	Quasi-Peak Adapter	85650A	3019A05393	2005-06-13
EMCO	Biconical Antenna	3110B	9309-1165	2005-10-11
EMCO	Log Periodic Antenna	3146	2101	2005-10-11
AH System	Horn Antenna	SAS-200/511	261	2005-08-02
HP	Spectrum Analyzer	HP8564E	3943A01781	2005-08-01

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

Environmental Conditions

Temperature:	18° C
Relative Humidity:	45%
ATM Pressure:	1080 mbar

The testing was performed by Daniel Deng on 2005-11-23

Test Result

Middle Frequency: -33.5 dB at 1880.00 MHz

Internal Antenna

Indicated		Table	Test Antenna		Substituted		Antenna	Cable	Absolute	Limit	Margin
Frequency	Ampl.	Angle	Height	Polar	Frequency	Level	Gain	Loss	Level		
MHz	dBuV	Degree	Meter	H/V	MHz	dBm	Correction	dB	dBm	dBm	dB
688.100	46.83	90	1.95	V	688.100	-60.9	1.1	0.6	-60.4	-13	-47.4
688.100	50.10	90	1.10	H	688.100	-56.8	1.1	0.6	-56.3	-13	-43.3
7520.000	32.60	270	1.60	H	7520.000	-60.5	11.1	5.2	-54.6	-13	-41.6
7520.000	33.50	90	1.70	V	7520.000	-59.7	11.1	5.2	-53.8	-13	-40.8
3759.865	36.83	270	2.10	H	3759.865	-61.6	11.4	3.2	-53.4	-13	-40.4
5639.800	43.15	270	1.70	H	5639.800	-58.3	10.3	4.1	-52.1	-13	-39.1
3759.865	40.50	90	1.90	V	3759.865	-58.8	11.4	3.2	-50.6	-13	-37.6
5639.800	45.67	90	1.70	V	5639.800	-56.2	10.3	4.1	-50.0	-13	-37.0