

TEST REPORT

Ref. Report No.

05-341-026

Name and address of the applicant

Novita CO., LTD.
MT.22, Jaeungari, Gigsan-eup, Cheonan-shi, Chungnam,
Korea 330-815.

Standard / Test regulation

FCC Part 18

Test result

Pass

Incoming date : Jun 24 , 2005

Test date : Jun 28, 2005

Test item(s) ;

Ultrasonic equipment
(Humidifier)

Model/type ref. ;

VS100

Manufacturer ;

Novita CO., LTD.

Additional information ;

-Required Authorization : Certification
-FCC ID : TFLVS100

This test report only responds to the tested sample and shall not be reproduced except in full without written approval of the Korea Testing Laboratory.

Tested and reported by



Bum-Jong Kim, Engineer

Reviewed by



Won-Seo Cho , Telecommunication Team
Manager

KOREA TESTING LABORATORY

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I. GENERAL INFORMATION

1. Grantee's Name and : Novita CO., LTD.
Mailing Address MT.22, Jaeungari, Gigsan-eup, Cheoan-shi, Chungnam, Korea 330-815.

2. Manufacturer's Name and : Novita CO., LTD.
Mailing Address MT.22, Jaeungari, Gigsan-eup, Cheoan-shi, Chungnam, Korea 330-815.

3. Equipment Descriptions

3.1 Input AC Power : 120 V / 60 Hz / 120 W
3.2 Operating Frequency : 1.6 MHz
3.3 Model Name : VS100
3.4 Type of EUT : Ultrasonic Humidifier

4. Rules and Regulations : FCC Part 18

5. Measuring Procedure : MP-5 (1986)

6. Place of Measurement : Absorber-lined Room (KTL)
Shield room (KTL)

7. Date of Measurement

7.1 Conducted Emission : July 01, 2005
7.2 Radiated Emission : June 28, 2005

II. CONDUCTED EMISSION MEASUREMENT (Section 180.307)

1. Test Procedure

Conducted emission measurements on the EUT were performed by "AC Power Line Conducted Emissions Testing" procedure as per MP-5. The EUT was set up on a wooden table 0.8 meters height, 1.0 by 1.5 meters in size, placed in the shielded enclosed with a side of wall of which constituted a vertical conducting surface of 2.2 m x 3.1 m in size to maintain 40 cm from the rear of EUT

LISN(Line Impedance Stabilization Network, R & S (ESH3-Z5, 3825/2, 50 ohm / 50 μ H) was installed and electrically boned to the conducting ground plane. The EUT was connected to the LISN using a typical power adapter.

One of two 50 ohm output terminals of the LISN was connected to the EMI Receiver(ROHDE & SCHWARZ, ESI7, 20 Hz to 7 GHz) and the other was terminated in 50 ohms. Measurements were again performed after interchanging such a connection oppositely.

The frequency range from 9 kHz to 30 MHz was examined and the remarkable frequencies were measured with Quasi-peak and Average values using the EMI receiver instrument (ROHDE & SCHWARZ, ESI7, 20 Hz to 7 GHz ; Detector Function ; CISPR Quasi-Peak & Average). The 6 dB bandwidth of the Receiver was set to 9 kHz

The position of connecting cables of the EUT was changed to find the worst case configuration during measurements. The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

2. Photograph for the test configuration



3. Sample Calculation

The emission level measured in decibels above one microvolt ($\text{dB}\mu\text{V}$) was converted into microvolt (μV) as shown in following sample calculation.

For example :

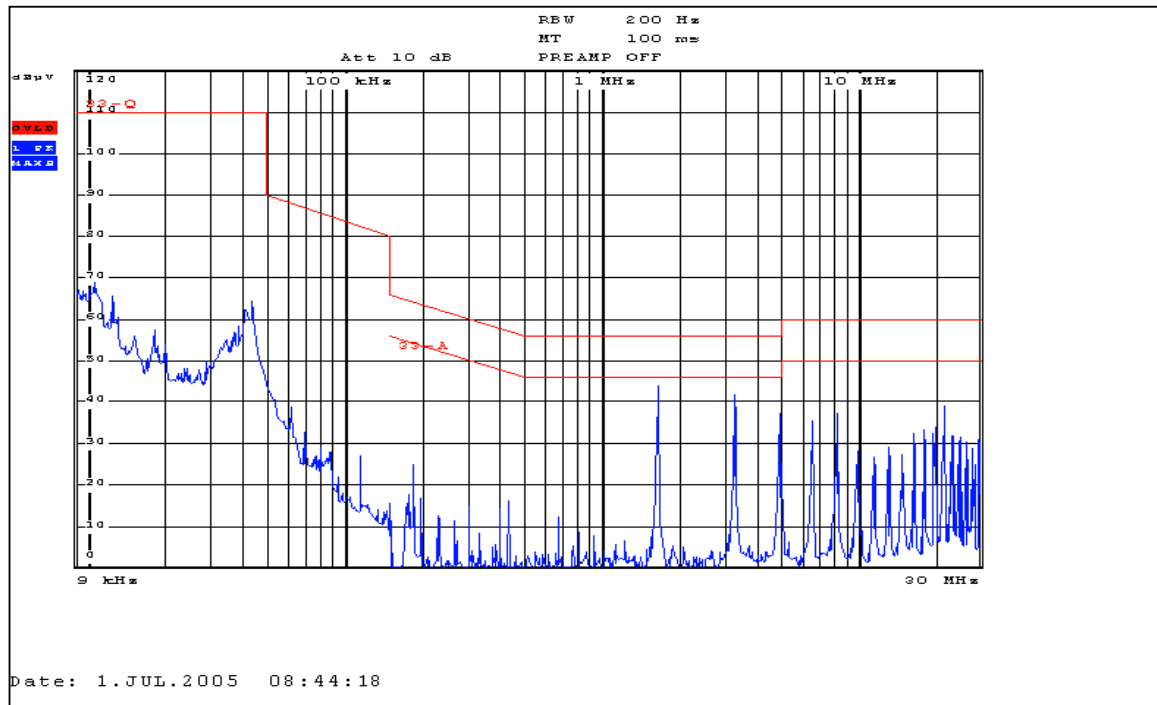
	Measured Value at	0.01 MHz	53.7 $\text{dB}\mu\text{V}$ @ Q-Peak mode
+	Cable Losses *		0.0 dB
<hr/>			
=	Conducted Emission		53.7 $\text{dB}\mu\text{V}$

* In case of RG214/ RF cable 15 Ft, the loss is about 0.17 dB at the frequency of 30 MHz which is negligible.

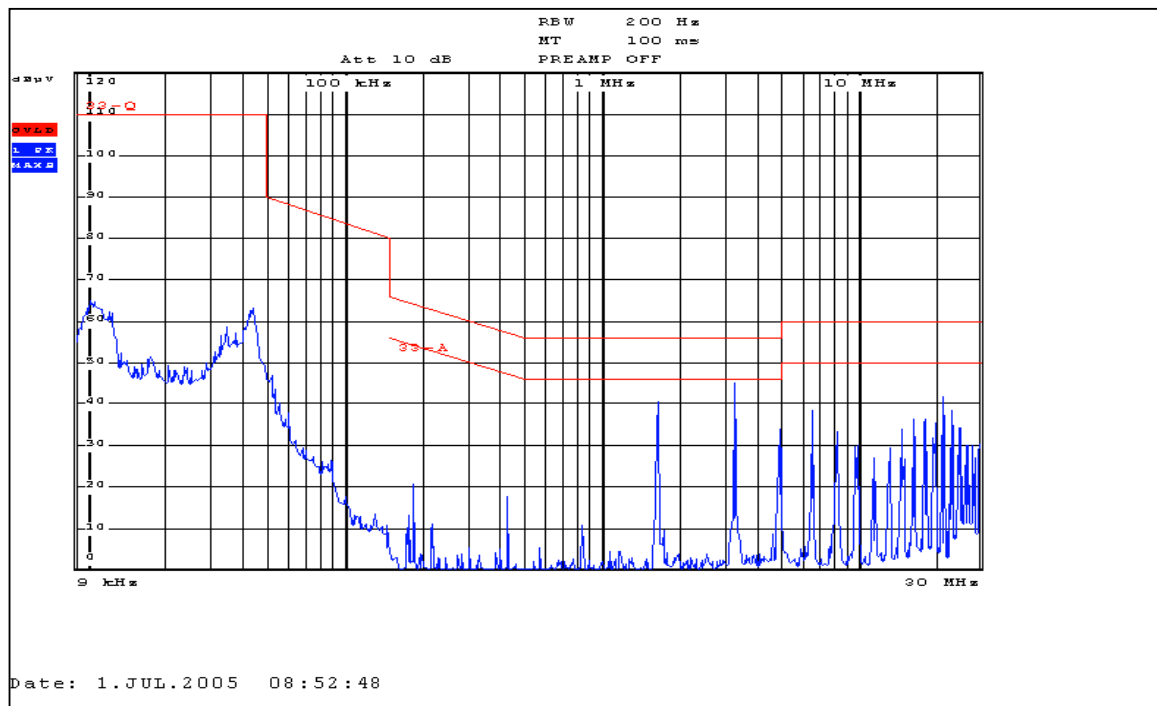
4. Measurement Data

- Resolution Bandwidth : x CISPR Quasi-Peak (6dB Bandwidth : 9 kHz)
 x Average (6dB Bandwidth : 9 kHz)

Power Lead Tested	Frequency (MHz)	Emission Level		Limit		(*) Margin	
		Q-Peak (dB μ V)	Average (dB μ V)	Q-Peak (dB μ V)	Average (dB μ V)	Q-Peak (dB μ V)	Average (dB μ V)
Live to Ground	0.01	53.7	-	110.0	-	-56.3	-
	0.04	55.5	-	110.0	-	-54.5	-
	0.18	16.4	2.1	65.1	55.1	-48.7	-53.0
	1.66	43.9	38.6	56.0	46.0	-12.1	-7.4
	3.31	41.6	34.3	56.0	46.0	-14.4	-11.7
	8.28	31.3	19.2	60.0	50.0	-28.7	-30.8
	21.50	31.9	22.6	60.0	50.0	-28.1	-27.4
Neutral to Ground	0.01	64.9	-	110.0	-	-57.0	-
	0.04	54.7	-	110.0	-	-54.3	-
	0.18	50.5	3.8	65.1	55.1	-48.0	-51.3
	1.66	44.4	34.4	56.0	46.0	-16.8	-11.6
	3.31	40.9	36.5	56.0	46.0	-12.1	-9.5
	6.65	48.4	23.3	60.0	50.0	-25.2	-26.7
	21.46	65.8	21.5	60.0	50.0	-27.4	-28.5
<p>Note : Refer to measured graphs on next page.</p> <p>* Margin(dB) : Emission Level (dB) - Limit (dB)</p> <p>Note : if testing with a quasi-peak detector demonstrates that the equipment complies with the average limits specified in the appropriate table in this section, additional testing to demonstrate compliance using an average detector is not required.</p>							



(Test side: Live-Ground side)



(Test side: Neutral-Ground side)

III. RADIATED EMISSION MEASUREMENT (Section 18.305)

1. Test Procedure

1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Loop antenna : 0.009 to 30 MHz) was placed at the distance of 1 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT while rotating the table.

Emissions level from the EUT with various configurations were examined on a Spectrum Analyzer connected with a RF amplifier and graphed by a plotter.

1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL absorber-lined room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by MP-5.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver or spectrum analyzer with a RF amplifier.

Turntable was rotated through 360 degrees and the center of the loop antenna was 1.0 meter above the ground plane. And the loop antenna was rotated about its vertical axis and positioned horizontally to read maximum emission level.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using the square of an inverse linear distance extrapolation factor (40dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

2. Photograph of the test configuration



3. Sample Calculation

The emission level measured in decibels above one microvolt ($\text{dB } \mu\text{V}$) was calculated as shown in following sample calculation.

For example :

	Measured Value at	<u>1.65 MHz</u>	20.6 dB μV
+	Antenna Factor		10.5 dB
+	Cable Loss		0.2 dB
–	Preamplifier		0.0 dB
–	Distance Correction Factor *		40 dB
<hr/>			
=	Radiated Emission		-8.7 dB $\mu\text{V/m}$
			(= 0.4 $\mu\text{V/m}$)

* Extrapolated from the measured distance(3 m) to the specified distance(30 m) using the square of an inverse linear distance extrapolation.

4. Measurement Data

- Resolution Bandwidth : Q-Peak (6 dB Bandwidth : 9 kHz for ranges below 1 GHz)
- Measurement Distance : 3 Meter

Frequency (MHz)	* D.M.	* A.P.	Measured Value (dB μ N)	* A.F. + C.L. (dB/m)	* A.G. (dB)	* D.C.F. (dB)	Emission Level (dB μ N/m)	Limit (dB μ N/m)	** Margin (dB)
1.65	Q	V	20.6	10.7	-	40	-8.7	23.5	-32.2
6.64	Q	V	13.3	9.8	-	40	-16.9	23.5	-40.4
16.65	Q	V	11.3	8.1	-	40	-20.6	23.5	-44.1
29.81	Q	H	16.5	6.0	-	40	-17.5	23.5	-41.0
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* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
A.P. : Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain
D.C.F. : Distance Correction Factor
< : Less than

** Margin (dB) = Emission Level (dB) - Limit (dB)

V. TEST EQUIPMENT USED FOR MEASUREMENTS

<u>Equipment</u>	<u>Model No.</u>	<u>Manufacturer</u>	<u>Serial No.</u>	<u>Effective Cal. Duration</u>
[x] EMI Receiver (20 MHz-1 GHz)	ESVS30	R & S	830516/002	03/14/05-03/14/06
[x] EMI Receiver (20 Hz-7 GHz)	ESI	R & S	835571/004	10/18/04-10/18/05
[x] Spectrum Analyzer (9 kHz-26.5 GHz)	8563A	H. P.	3222A02069	03/16/05-03/16/06
[x] Spectrum Analyzer (3 Hz-50 GHz)	E4448A	Agilent	MY43360322	03/16/05-03/16/06
[] Test Receiver (9 kHz-30 MHz)	ESH3	R & S	860905/001	06/18/05-06/18/06
[x] Pre-Amplifier (0.1-3000 MHz, 30 dB)	8347A	H. P.	2834A00543	05/19/05-05/19/06
[] Pre-Amplifier (1-26.5 GHz, 35 dB)	8449B	H. P.	3008A00302	06/22/05-06/22/06
[x] LISN(50 Ω , 50 μ H) (10 kHz-100 MHz)	ESH3-Z5	R & S	826789/009	05/16/05-05/16/06
[] Plotter	7470A	H. P.	3104A21292	-
[] Tuned Dipole Ant. (30 MHz-300 MHz)	VHA 9103	Schwarzbeck	-	*
[] Tuned Dipole Ant. (300 MHz-1 GHz)	UHA 9105	Schwarzbeck	-	*
[] BiConi-Log Ant. (30 MHz -1 GHz)	VULB9168	Schwarzbeck	9168-167	*
[] Horn Ant. (1 GHz-18 GHz)	3115	EMCO	-	*
[x] Active Loop Ant. (9 kHz-30 MHz)	6507	EMCO	2532	04/29/05-04/29/06
[] DC Power Supply	6260B	H.P.	1145A04822	-
[x] Shielded Room (5.0 m x 4.5 m)	-	SIN-MYUNG	-	-

* Each set of antennas has been calibrated to ensure correlation with ANSI C63.5 standard. The calibration of antennas is traceable to Korea Standard Research Institute(KSRI).