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CERTIFICATION DIVISION

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## EMI CERTIFICATION REPORT

**Applicant:**

**LG Electronics Inc.**

**60-39, Gasan-dong, Gumchon-gu, Seoul  
153-023, Korea**

**Date of Issue: July 08, 2011**

**Test Report No.: HCTE1107FE18**

**Test Site: HCT CO., LTD.**

**HCT FRN: 0005-8664-21**

**FCC ID:**

**ZNFVN271**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B  
Equipment Type : Cellular/ PCS CDMA Phone with Bluetooth  
Trade Name : LG Electronics Inc  
Model(s) Name: : VN271, LG-VN271  
Port / Connector(s) : USB Port / Headset Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

**Report prepared by**  
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## TABLE OF CONTENTS

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|                                                   | PAGE |
|---------------------------------------------------|------|
| 1. GENERAL INFORMATION                            |      |
| 1.1 Product description                           | 3    |
| 1.2 Related submittal(s)/Grant(s)                 | 3    |
| 1.3 Tested system details                         | 4    |
| 1.4 Cable description                             | 5    |
| 1.5 Noise suppression parts on cable. (I/O cable) | 5    |
| 1.6 Test methodology                              | 6    |
| 1.7 Test facility                                 | 6    |
| 1.8 Frequency Range of Radiated Measurements      | 6    |
| 2. SYSTEM TEST CONFIGURATION                      |      |
| 2.1 Configuration of tested system                | 7    |
| 3. PRELIMINARY TEST                               |      |
| 3.1 Conducted Emission test                       | 8    |
| 3.2 Radiated Emission test                        | 8    |
| 4. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY  |      |
| 4.1 Conducted Emission test                       | 9    |
| 4.2 Radiated Emission test                        | 14   |
| 5. FIELD STRENGTH CALCULATION                     | 15   |
| 6. TEST EQUIPMENT                                 | 16   |
| 7. CONCLUSION                                     | 17   |

**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test (E.U.T) is **Cellular/ PCS CDMA Phone with Bluetooth, Model: VN271** manufactured by **LG Electronics Inc.** Its basic purpose is used for communications.

|                         |                                                                                  |
|-------------------------|----------------------------------------------------------------------------------|
| <b>Model</b>            | VN271                                                                            |
| <b>Additional Model</b> | LG-VN271                                                                         |
| <b>FCC ID</b>           | ZNFVN271                                                                         |
| <b>E.U.T Type</b>       | Cellular/ PCS CDMA Phone with Bluetooth                                          |
| <b>TX Frequency</b>     | 824.70 MHz to 848.31 MHz (CDMA 850)<br>1 851.25 MHz to 1 908.75 MHz (PCS CDMA)   |
| <b>RX Frequency</b>     | 869.70 MHz to 893.31 MHz (CDMA 850)<br>1 931.25 MHz to 1 988.75 MHz (CDMA 1 900) |

### 1.2 Related Submittal(s) / Grant(s)

Original submittal only.

### 1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

| Device Type                             | Manufacturer        | Model Number                                    | FCC ID / DoC | Connected To                 |
|-----------------------------------------|---------------------|-------------------------------------------------|--------------|------------------------------|
| Cellular/ PCS CDMA Phone with Bluetooth | LG                  | VN271                                           | ZNFVN271     | Notebook PC                  |
| Notebook PC                             | LG                  | X140-02                                         | DoC          | E.U.T<br>Notebook PC adaptor |
| Notebook PC adaptor                     | DELTA<br>(JIANG SU) | ADP-40PH AD                                     | -            | Notebook PC                  |
| Mouse                                   | Microsoft           | Intellimouse optical USB<br>and PS/2 compatible | DoC          | Notebook PC                  |
| USB cable                               | -                   | -                                               | -            | E.U.T<br>Notebook PC         |
| Headset                                 | -                   | -                                               | -            | E.U.T                        |
| Micro SD card (2 GB)                    | SanDisk             | -                                               | -            | E.U.T                        |

## 1.4 Cable Description

| Product Name                            | Port         | Power Cord Shielded (Y/N) | I/O Cable Shielded (Y/N) | Length (m) |
|-----------------------------------------|--------------|---------------------------|--------------------------|------------|
| Cellular/ PCS CDMA Phone with Bluetooth | Headset jack | -                         | N                        | (D)1.1     |
|                                         | USB data     | Y                         | Y                        | (P,D)1.2   |
| Notebook PC                             | USB (Mouse)  | -                         | Y                        | (D)1.8     |

\* The marked "(D)" means the data cable and "(P)" means the power cable.

## 1.5 Noise Suppression Parts on Cable. (I/O cable)

| Product Name                            | Port         | Ferrite Bead (Y/N) | Location        | Metal Hood (Y/N) | Location        |
|-----------------------------------------|--------------|--------------------|-----------------|------------------|-----------------|
| Cellular/ PCS CDMA Phone with Bluetooth | Headset jack | N                  | -               | Y                | E.U.T End       |
|                                         | USB data     | N                  | -               | Y                | Both End        |
| Notebook PC                             | USB (Mouse)  | Y                  | Notebook PC End | Y                | Notebook PC End |

## 1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

## 1.7 Test Facility

The 10 m semi anechoic chamber used to collect the test is located at the 105-1, Jangam -Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, Republic of Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4. Detailed description of test facilities was submitted to the Commission and accepted dated Sep. 03, 2010 (Registration Number: 90661)

## 1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

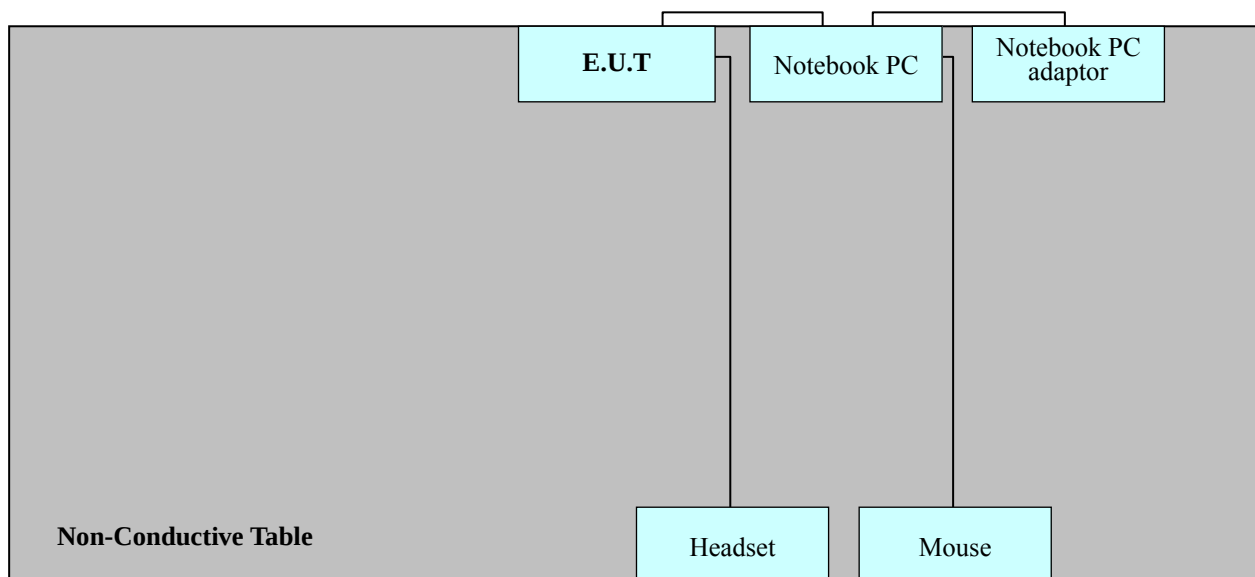
| Highest frequency generated or used in the device<br>or on which the device operates or tunes (MHz) | Upper frequency of measurement range<br>(MHz)                                      |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Below 1.705                                                                                         | 30                                                                                 |
| 1.705 to 108                                                                                        | 1 000                                                                              |
| 108 to 500                                                                                          | 2 000                                                                              |
| 500 to 1 000                                                                                        | 5 000                                                                              |
| Above 1 000                                                                                         | 5 <sup>th</sup> harmonic of the highest frequency<br>or 40 GHz, whichever is lower |

## 2. SYSTEM TEST CONFIGURATION

### 2.1 Configuration of Test System

- Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor.  
Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.
- Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 10 m semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 110 VAC

### **3. PRELIMINARY TEST**

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#### **3.1 Conducted Emission Test**

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**      ☒ Data Communication mode

#### **3. 2 Radiated Emission Test**

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**      ☒ Data Communication mode

## 4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

|                |                                               |
|----------------|-----------------------------------------------|
| Limit Apply to | : FCC PART 15 Subpart B Class B               |
| Detector       | : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz) |
| Operation Mode | : Data Communication mode                     |
| Temperature    | : 24.1 °C                                     |
| Humidity Level | : 52.1 %                                      |
| Test Date      | : July 07, 2011                               |

※ **NOTE:** Refer to page 10 to page 13 for details.

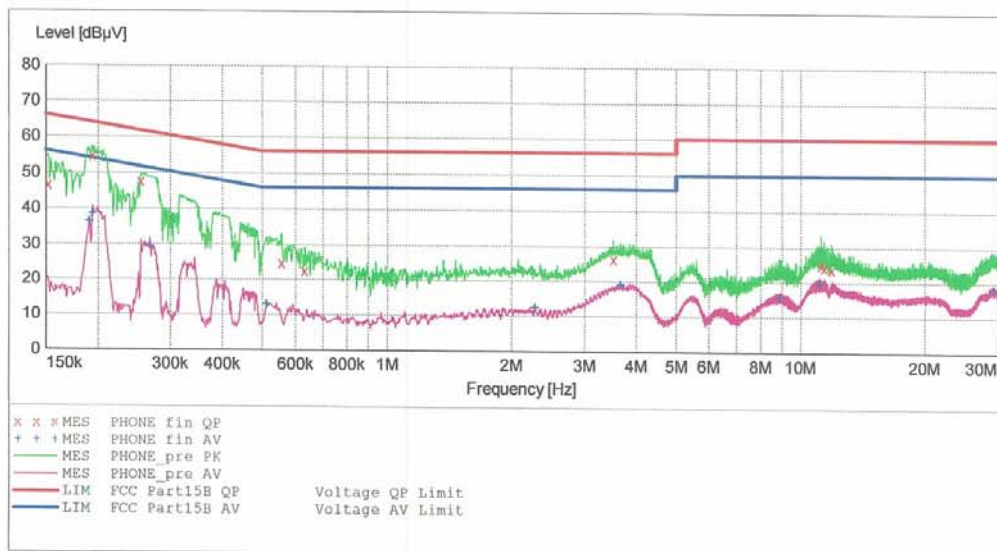
**HCT**

**EMC**

EUT: VN271  
Manufacturer: LG  
Operating Condition: DATA MODE  
Test Site: SHIELD ROOM  
Operator: DH-RYU  
Test Specification: FCC PART15 CLASS B  
Comment: H

**SCAN TABLE: "FCC PART 15 B(H)"**

| Short Description: |                |            | FCC PART 15 CLASS B |            |           |            |
|--------------------|----------------|------------|---------------------|------------|-----------|------------|
| Start Frequency    | Stop Frequency | Step Width | Detector            | Meas. Time | IF Bandw. | Transducer |
| 150.0 kHz          | 500.0 kHz      | 1.0 kHz    | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |                |            | Average             |            |           |            |
| 500.0 kHz          | 5.0 MHz        | 4.0 kHz    | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |                |            | Average             |            |           |            |
| 5.0 MHz            | 30.0 MHz       | 4.0 kHz    | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |                |            | Average             |            |           |            |



**MEASUREMENT RESULT: "PHONE\_fin QP"**

7/7/2011 1:12PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.152010      | 46.50      | 10.1      | 66         | 19.4      | ---  | --- |
| 0.194010      | 54.60      | 10.1      | 64         | 9.2       | ---  | --- |
| 0.254010      | 47.60      | 10.1      | 62         | 14.0      | ---  | --- |
| 0.556000      | 24.70      | 10.1      | 56         | 31.3      | ---  | --- |
| 0.632000      | 22.50      | 10.1      | 56         | 33.5      | ---  | --- |
| 3.528000      | 26.30      | 10.3      | 56         | 29.7      | ---  | --- |
| 11.208000     | 25.00      | 11.0      | 60         | 35.0      | ---  | --- |
| 11.404000     | 24.30      | 11.1      | 60         | 35.7      | ---  | --- |
| 11.896000     | 23.80      | 11.1      | 60         | 36.2      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

7/7/2011 1:12PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.191010         | 36.20         | 10.1         | 54            | 17.8         | ---  | --- |
| 0.194010         | 38.40         | 10.1         | 54            | 15.5         | ---  | --- |
| 0.267010         | 29.40         | 10.1         | 51            | 21.8         | ---  | --- |
| 0.512000         | 12.90         | 10.1         | 46            | 33.1         | ---  | --- |
| 2.280000         | 12.30         | 10.2         | 46            | 33.7         | ---  | --- |
| 3.668000         | 19.10         | 10.4         | 46            | 26.9         | ---  | --- |
| 8.936000         | 15.60         | 10.9         | 50            | 34.4         | ---  | --- |
| 11.068000        | 19.70         | 11.0         | 50            | 30.3         | ---  | --- |
| 29.248000        | 18.00         | 12.2         | 50            | 32.0         | ---  | --- |

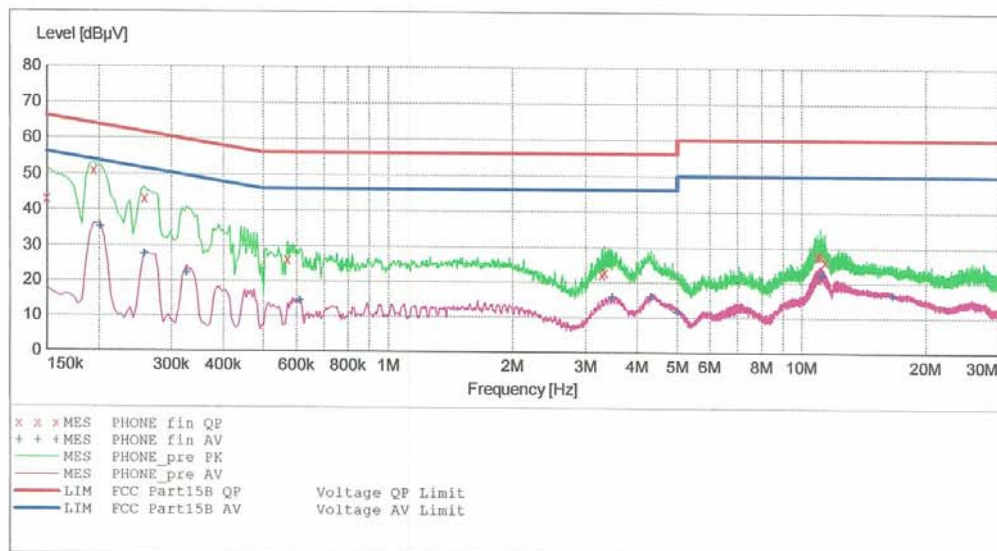
**HCT**

**EMC**

EUT: VN271  
Manufacturer: LG  
Operating Condition: DATA MODE  
Test Site: SHIELD ROOM  
Operator: DH-RYU  
Test Specification: FCC PART15 CLASS B  
Comment: N

**SCAN TABLE: "FCC PART 15 B(N)"**

| Short Description: |           |         | FCC PART 15 CLASS B |            |           |            |
|--------------------|-----------|---------|---------------------|------------|-----------|------------|
| Start              | Stop      | Step    | Detector            | Meas. Time | IF Bandw. | Transducer |
| Frequency          | Frequency | Width   |                     |            |           |            |
| 150.0 kHz          | 500.0 kHz | 4.0 kHz | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average             |            |           |            |
| 500.0 kHz          | 5.0 MHz   | 4.0 kHz | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average             |            |           |            |
| 5.0 MHz            | 30.0 MHz  | 4.0 kHz | MaxPeak             | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average             |            |           |            |



**MEASUREMENT RESULT: "PHONE\_fin QP"**

7/7/2011 1:18PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.150010      | 43.10      | 10.3      | 66         | 22.9      | ---  | --- |
| 0.194010      | 50.90      | 10.3      | 64         | 12.9      | ---  | --- |
| 0.258010      | 43.20      | 10.3      | 62         | 18.3      | ---  | --- |
| 0.572000      | 26.20      | 10.3      | 56         | 29.8      | ---  | --- |
| 3.300000      | 22.30      | 10.5      | 56         | 33.7      | ---  | --- |
| 3.344000      | 22.80      | 10.5      | 56         | 33.2      | ---  | --- |
| 10.908000     | 27.70      | 11.1      | 60         | 32.3      | ---  | --- |
| 11.132000     | 27.90      | 11.1      | 60         | 32.1      | ---  | --- |
| 11.412000     | 26.20      | 11.1      | 60         | 33.8      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

7/7/2011 1:18PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.202010         | 35.10         | 10.3         | 54            | 18.5         | ---  | --- |
| 0.258010         | 27.50         | 10.3         | 52            | 24.0         | ---  | --- |
| 0.326010         | 22.10         | 10.3         | 50            | 27.5         | ---  | --- |
| 0.612000         | 14.40         | 10.3         | 46            | 31.6         | ---  | --- |
| 3.488000         | 15.70         | 10.6         | 46            | 30.3         | ---  | --- |
| 4.320000         | 15.90         | 10.6         | 46            | 30.1         | ---  | --- |
| 5.000000         | 11.60         | 10.7         | 46            | 34.4         | ---  | --- |
| 11.200000        | 22.10         | 11.1         | 50            | 27.9         | ---  | --- |
| 16.604000        | 16.50         | 11.5         | 50            | 33.5         | ---  | --- |

## 4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Limit Apply to : FCC PART 15 Subpart B Class B

**-For measurement below 1 GHz**

Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)

Operation Mode : Data Communication mode

**-For measurement above 1 GHz**

Setting : Peak mode: Detector- Peak(RBW: 1 MHz / VBW: 1 MHz)

: Average mode: Detector- Peak (RBW: 1 MHz / VBW: 10 Hz)

Temperature : 25.5 °C

Humidity Level : 51.0 %

Test Date : July 07, 2011

| Frequency<br>(MHz) | Reading<br>(dBuV) | Polarity<br>(H/V) | Antenna<br>Height<br>(m) | Correction Factor |               | Limit<br>(dBuV/m) | Level<br>(dBuV/m) | Margin<br>(dB) |
|--------------------|-------------------|-------------------|--------------------------|-------------------|---------------|-------------------|-------------------|----------------|
|                    |                   |                   |                          | Antenna<br>(dB/m) | Cable<br>(dB) |                   |                   |                |
| 129.2              | 20.36             | V                 | 1.0                      | 11.88             | 1.96          | 43.5              | 34.2              | 9.3            |
| 151.0              | 15.91             | V                 | 1.0                      | 12.87             | 2.12          | 43.5              | 30.9              | 12.6           |
| 191.9              | 15.58             | H                 | 3.0                      | 10.21             | 2.40          | 43.5              | 28.2              | 15.3           |
| 377.9              | 10.81             | H                 | 1.0                      | 15.15             | 3.44          | 46.0              | 29.4              | 16.6           |
| 485.9              | 7.30              | V                 | 1.0                      | 17.68             | 3.93          | 46.0              | 28.9              | 17.1           |
| 807.9              | 4.37              | H                 | 3.0                      | 22.77             | 5.17          | 46.0              | 32.3              | 13.7           |

**※ NOTE:**

1. Measurement above 1 GHz was performed from 1 GHz to the 5<sup>th</sup> harmonic of highest fundamental frequency. The highest fundamental frequency is CDMA 1 900 center frequency.
2. For measurement above 1 GHz, Emission noise was not founded over the ambient noise.

## 5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.  
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB $\mu$ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB $\mu$ V/m value is mathematically converted to its corresponding level in  $\mu$ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

### [Radiated Emission Limits]

| Frequency of Emission<br>(MHz) | Field Strength |              |
|--------------------------------|----------------|--------------|
|                                | $\mu$ V/m      | dB $\mu$ V/m |
| 30 to 88                       | 100            | 40.0         |
| 88 to 216                      | 150            | 43.5         |
| 216 to 960                     | 200            | 46.0         |
| Above 960                      | 500            | 54.0         |

## 6. TEST EQUIPMENT

| <u>Type</u> | <u>Manufacturer</u> | <u>Model Number</u> | <u>Serial Number</u> | <u>Next CAL Date</u> |
|-------------|---------------------|---------------------|----------------------|----------------------|
|-------------|---------------------|---------------------|----------------------|----------------------|

### Conducted Emission

|                                                       |                 |         |              |            |
|-------------------------------------------------------|-----------------|---------|--------------|------------|
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESCI    | 100584       | 2012.05.03 |
| <input checked="" type="checkbox"/> LISN              | Rohde & Schwarz | ESH3-Z5 | 100282       | 2012.02.01 |
| <input type="checkbox"/> LISN                         | Rohde & Schwarz | ENV216  | 100073       | 2012.04.01 |
| <input checked="" type="checkbox"/> Attenuator        | Rohde & Schwarz | ESH3-Z2 | 357.8810.352 | 2011.10.25 |

### Radiated Emission

|                                                           |                 |            |            |            |
|-----------------------------------------------------------|-----------------|------------|------------|------------|
| <input type="checkbox"/> EMI Test Receiver                | Rohde & Schwarz | ESI40      | 831564103  | 2011.10.29 |
| <input checked="" type="checkbox"/> EMI Test Receiver     | Rohde & Schwarz | ESU26      | 100241     | 2011.09.01 |
| <input checked="" type="checkbox"/> Trilog Antenna        | Schwarzbeck     | VULB9160   | 3125       | 2013.05.03 |
| <input checked="" type="checkbox"/> Antenna master        | INNCO Systems   | MA4000-EP  | MA4000/283 | -          |
| <input checked="" type="checkbox"/> Turn Table            | INNCO Systems   | DT3000-3T  | DT3000/69  | -          |
| <input checked="" type="checkbox"/> Communication Antenna | Schwarzbeck     | USLP9142   | 9142-248   | -          |
| <input checked="" type="checkbox"/> Horn Antenna          | Schwarzbeck     | BBHA 9120D | -          | 2012.04.13 |
| <input checked="" type="checkbox"/> Power Amplifier       | Rohde & Schwarz | SCU-18     | 10094      | 2011.09.29 |
| <input type="checkbox"/> Base Station                     | Rohde & Schwarz | CMU 200    | 1100000802 | 2012.02.16 |

## **7. CONCLUSION**

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The data collected shows that the **Cellular/ PCS CDMA Phone with Bluetooth, Model: VN271, FCC ID: ZNFVN271** complies with §15.107 and §15.109 of the FCC rules.