



# FCC Test Report

## FCC Part 15, SUBPART B

FOR

800/1900 CDMA Handset

Model #s: 2365i, 2366i, 2367i, 2362

Nokia, Inc.  
12278 Scripps Summit Drive  
San Diego, CA 92131  
U.S.A

TEST REPORT #: EMC\_NOKI1\_003\_06002\_FCC15brev3  
DATE: January 9<sup>th</sup>, 2007



Certificate # 2135.01



Bluetooth  
Qualification Test  
Facility  
(BQTF)



FCC listed#  
101450

IC recognized #  
3925

### **CETECOM Inc.**

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CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686  
Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May



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## 1 Assessment

**The following is in compliance with the applicable criteria specified in FCC rules Part 15 subpart B of the Code of Federal Regulations**

Company	Description	Model #
Nokia	800/1900 CDMA Handset	2365i, 2366i, 2367i, 2362

A handwritten signature in blue ink, appearing to read "Lothar Schmidt", is written over a horizontal line.

Lothar Schmidt  
Lab Manager  
1/9/2007

The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.



## **2 Administrative Data**

### **2.1 Identification of the Testing Laboratory Issuing the EMC Test Report**

Company Name:	<b>CETECOM Inc.</b>
Department:	<b>EMC</b>
Address:	<b>411 Dixon Landing Road Milpitas, CA 95035 U.S.A.</b>
Telephone:	<b>+1 (408) 586 6200</b>
Fax:	<b>+1 (408) 586 6299</b>
Responsible Test Lab Manager:	<b>Lothar Schmidt</b>
Responsible Project Leader:	<b>Pete Krebill</b>
Date of tests:	<b>November 6<sup>th</sup>, 2006 &amp; January 8<sup>th</sup>, 2007</b>

### **2.2 Identification of the Client**

Applicant's Name:	<b>Nokia, Inc.</b>
Street Address:	<b>12278 Scripps Summit Drive</b>
City/Zip Code	<b>San Diego, CA 92131</b>
Country	<b>USA</b>
Contact Person:	<b>Mary Washington-Mhlanga</b>
Phone No.	<b>858-831-5000</b>
Fax:	<b>858-831-6500</b>
e-mail:	<b>Mary.Washington-Mhlanga@nokia.com</b>

### **2.3 Identification of the Manufacturer**

Manufacturer's Name:	<b>Same as applicant</b>
----------------------	--------------------------

### **3 Equipment under Test (EUT)**

#### **3.1 Identification of the Equipment under Test**

Marketing Name:	<b>2365i, 2366i, 2367i, 2362</b>
Description:	<b>800/1900 CDMA Handset</b>
Model No:	<b>2365i, 2366i, 2367i, 2362</b>
Hardware Revision :	<b>5001</b>
Software Revision :	<b>PR100b11.nep</b>
ESN:	<b>026/01183055</b>
FCC ID:	<b>QMNRM-155</b>

#### **3.2 Accessories used during testing**

Name	Manufacturer	Model No.
<b>battery</b>	<b>Nokia</b>	<b>BL-5B</b>
<b>Headset</b>	<b>Nokia</b>	<b>HS-9</b>
<b>AC charger</b>	<b>Nokia</b>	<b>AC-3U</b>
<b>data cable</b>	<b>Nokia</b>	<b>DAU9T</b>
<b>Laptop PC</b>	<b>IBM</b>	<b>Type 2373</b>
<b>Laptop AC adapter</b>	<b>IBM</b>	<b>PA-1121-071</b>
<b>Laptop docking station</b>	<b>IBM</b>	<b>Type 2878</b>

### **4 Subject Of Investigation**

All testing was performed on the Nokia 2365i referred to as EUT hereafter.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 15 subpart B of the Code of Federal Regulations.



## **5 Measurements**

### **5.1 Environment:**

Temperature: **20.1 °C – 23.9°C**

Humidity: **45% \_ 55 %**

### **5.2 Measurement Summary**

<b>Measurement:</b>	<b>Verdict:</b>
Radiated emissions FCC 15.109/15.209	Passed
AC Power line conducted emissions FCC 15.107/207	Passed

### **5.3 RADIATED EMISSIONS 15.109/15.209**

#### **5.3.1 LIMITS**

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (microvolts/meter)
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

§15.109 (c) In the emission tables above, the tighter limit applies at the band edges. Sections 15.33 and 15.35 which specify the frequency range over which radiated emissions are to be measured and the detector functions and other measurement standards apply.

§15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in the Third Edition of International Electrotechnical Commission ("IEC"), International Special Committee on Radio Interference (CISPR) Pub. 22 (1997), "Information Technology Equipment -- Radio Disturbance Characteristics -- Limits and Methods of Measurement." This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of CISPR publications may be purchased from the Global Engineering Documents, P. O. Box 8500 (S-4485), Philadelphia, PA 19178-4485, (303) 792-2181 or (800) 624-3974. Copies also may be inspected, but not reproduced, during normal business hours at the following locations: Federal Communications Commission, Reference Information Center, Room CY-A257, 445 12th Street, SW., Washington, DC, and Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC. In addition:

(1) The test procedure and other requirements specified in this part shall continue to apply to digital devices.

(2) If, in accordance with §15.33 of this part, measurements must be performed above 1000 MHz, compliance above 1000 MHz shall be demonstrated with the emission limit in paragraph (a) or (b) of this section, as appropriate. Measurements above 1000 MHz may be performed at the distance specified in the CISPR 22 publications for measurements below 1000 MHz provided the limits in paragraphs (a) and (b) of this section are extrapolated to the new measurement distance using an inverse linear distance extrapolation factor (20 dB/decade), e.g., the radiated limit above 1000 MHz for a Class B digital device is 150 uV/m, as measured at a distance of 10 meters.

(3) The measurement distances shown in CISPR Pub. 22, including measurements made in accordance with this paragraph above 1000 MHz, are considered, for the purpose of §15.31(f)(4) of this part, to be the measurement distances specified in this part.

(4) If the radiated emissions are measured to demonstrate compliance with the alternative standards in this paragraph, compliance must also be demonstrated with the conducted limits shown in §15.107(e).

(5) Radiated emissions are maximized by rotating the EUT 360° at 0.5 meter height increments between 1 and 4 meters.

(6) Radiated emissions above 1 GHz are measured at a distance of 1 meter. The results shown below are extrapolated to 3 meters.

### **5.3.2 OPERATING MODE**

Radiated emissions testing was performed with the EUT connected to a laptop PC that was running data transfer software via the EUT's data cable.

### **5.3.3 RESULTS**

Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polarity	Detector
883.4	39.51	46	-6.49	Horizontal	Peak
933.1	37.50	46	-8.5	Horizontal	Peak
33.6	30.12	40	-9.88	Vertical	Peak
883.4	38.37	46	-7.63	Vertical	Peak
933.1	38.12	46	-7.88	Vertical	Peak





(30MHz-1GHz Vertical)

**CETECOM Inc.**

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description:

Customer: Nokia

Test Mode: Data transfer

Ant Orientation: V

EUT Orientation: Tabletop w/ laptop PC/AC-DC adapter/headset

Test Engineer: Pete K

Voltage:: AC-DC

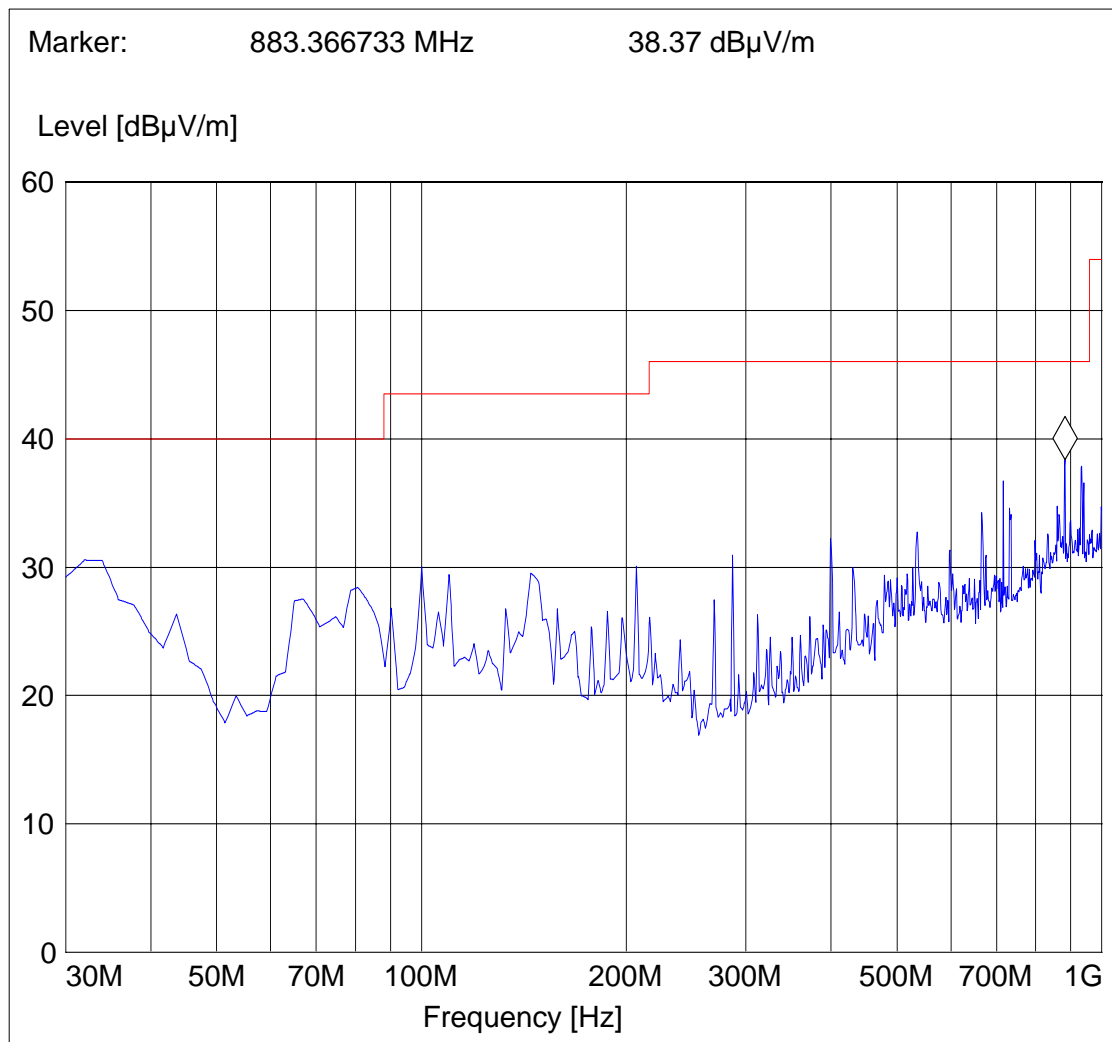
Sweep: FCC 15

**SWEEP TABLE: "FCC15\_30M-1G\_Ver"**

Unit: dB $\mu$ V/m

Detector: Mode:

Curve 1: MaxPeak MaxHold





**(30MHz-1GHz Horizontal)**

**CETECOM Inc.**

**411 Dixon Landing Road, Milpitas CA 95035, USA**

EUT / Description:

Customer: Nokia

Test Mode: Data transfer

Ant Orientation: H

EUT Orientation: Tabletop w/ laptop PC/AC-DC adapter/headset

Test Engineer: Pete K

Voltage:: AC-DC

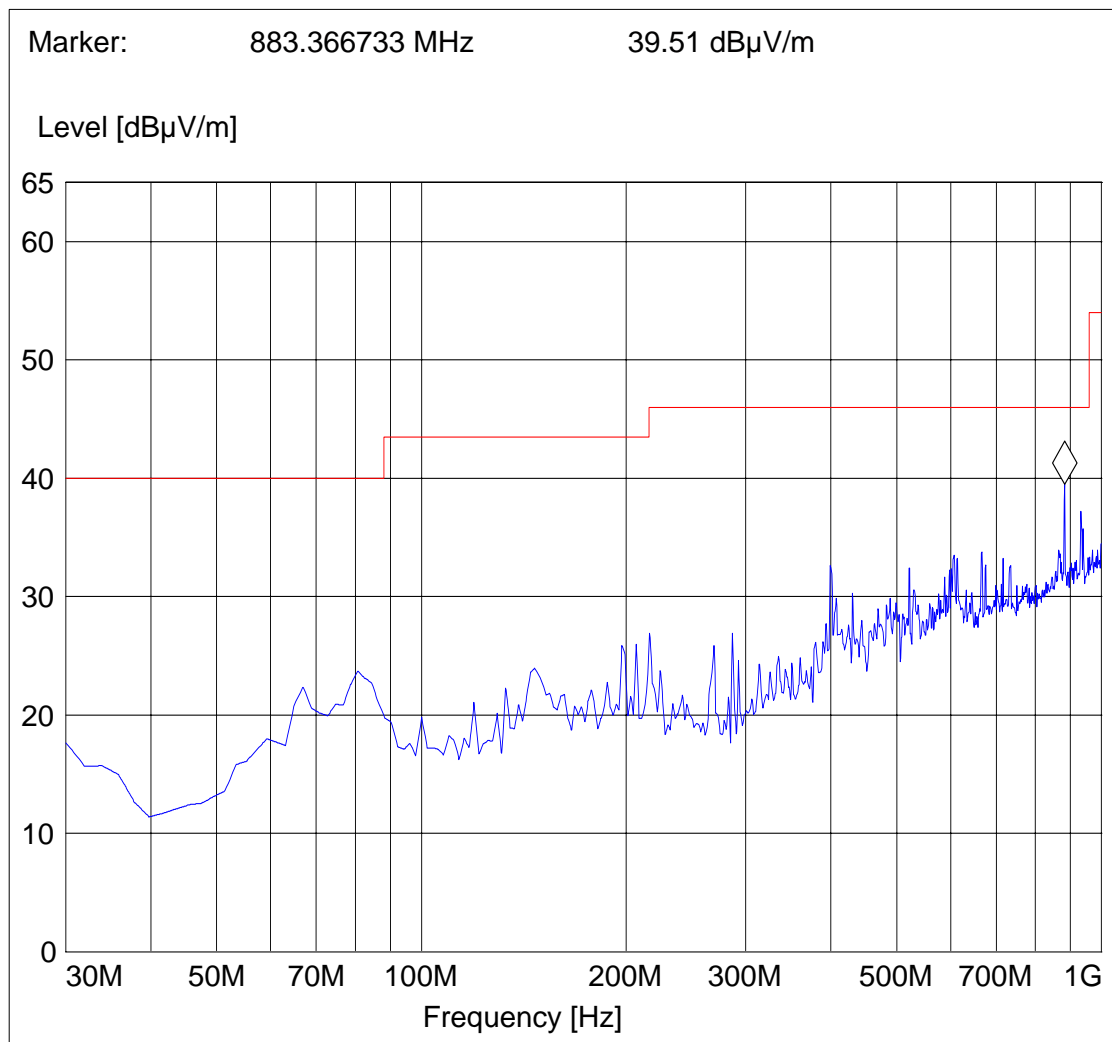
Sweep: FCC 15

***SWEEP TABLE: "FCC15\_30M-1G\_Hor"***

Unit: dB $\mu$ V/m

Detector: Mode:

Curve 1: MaxPeak MaxHold





(1 GHz-10GHz Vertical)

**CETECOM Inc.**

**411 Dixon Landing Road; Milpitas, CA 95035**

EUT / Description:

Customer: Nokia

Test Mode: Data transfer

Ant Orientation: V

EUT Orientation: Tabletop w/ laptop PC/AC-DC adapter/headset

Test Engineer: Pete K

Voltage:: AC-DC

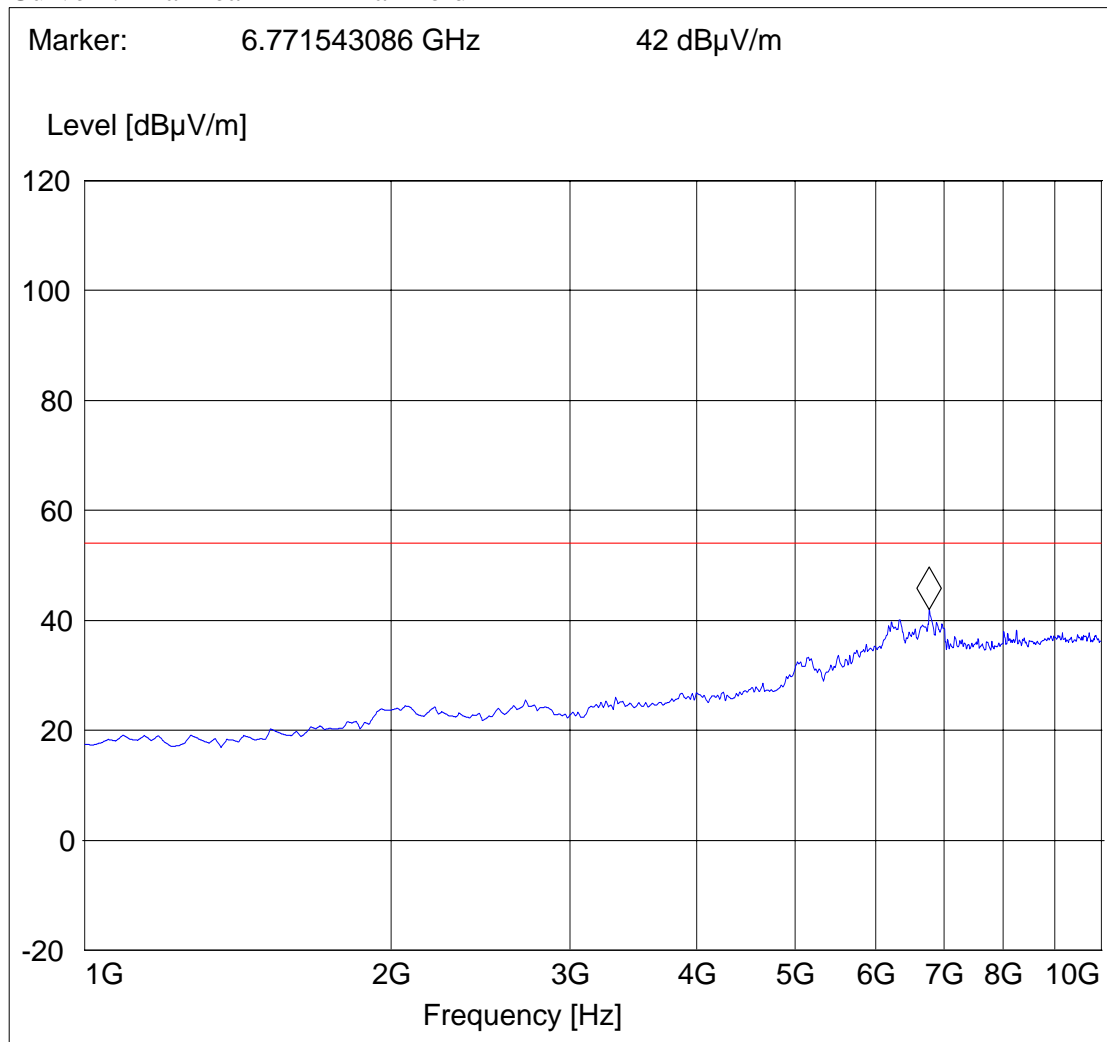
Sweep: FCC 15

***SWEEP TABLE: "FCC15.109\_1-10GHz"***

Unit: dB $\mu$ V/m

Detector: Mode:

Curve 1: MaxPeak MaxHold





**(1 GHz-10GHz Horizontal)**

**CETECOM Inc.**

**411 Dixon Landing Road; Milpitas, CA 95035**

Customer: Nokia

Test Mode: Data transfer

Ant Orientation: H

EUT Orientation: Tabletop w/ laptop PC/AC-DC adapter/headset

Test Engineer: Pete K

Voltage:: AC-DC

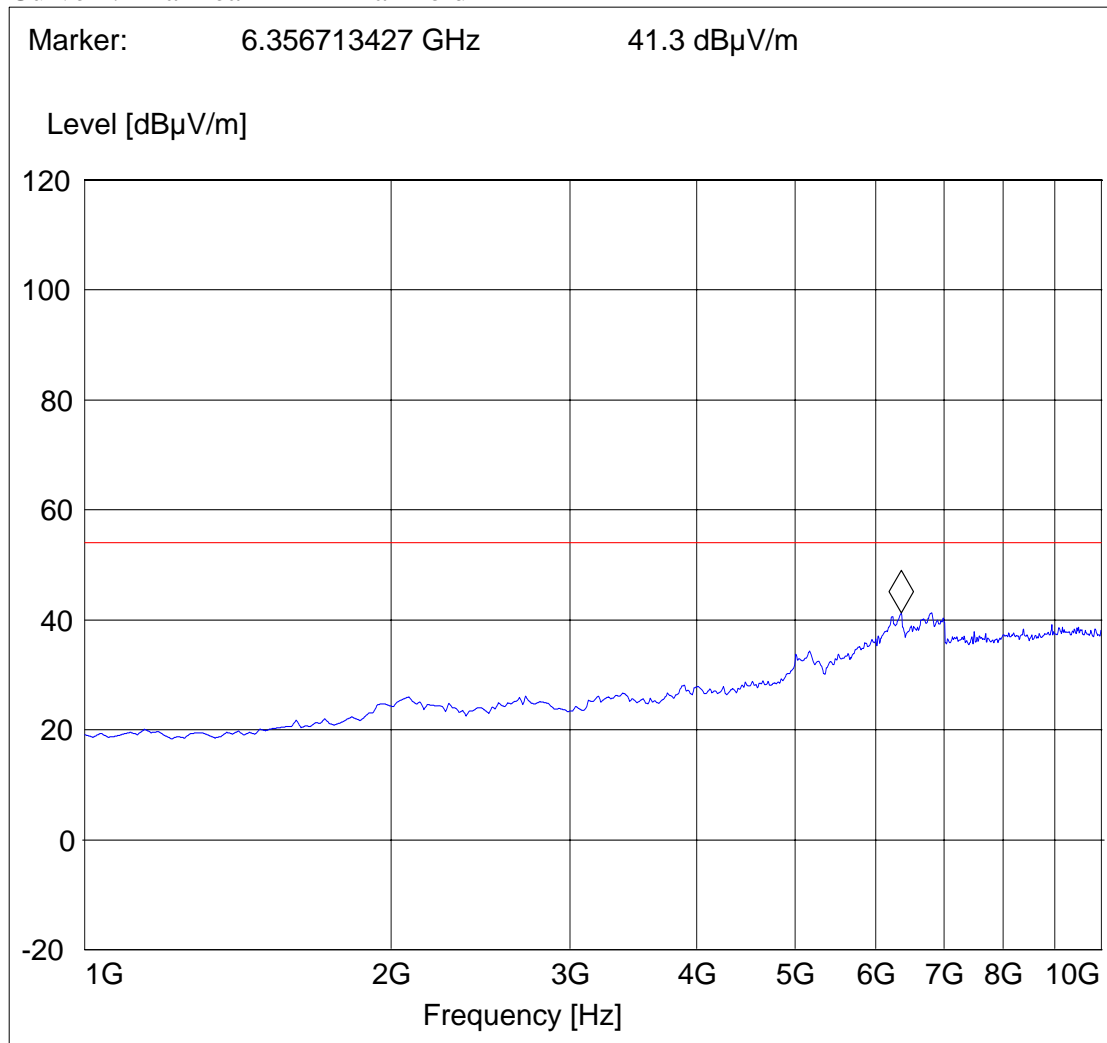
Sweep: FCC 15

**SWEEP TABLE: "FCC15.109\_1-10GHz"**

Unit: dB $\mu$ V/m

Detector: Mode:

Curve 1: MaxPeak MaxHold



#### **5.4 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207**

##### **5.4.1 LIMITS**

**Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)**

##### **LIMIT**

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

##### **Limit**

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50
* Decreases with logarithm of the frequency		

**ANALYZER SETTINGS: RBW = 10KHz**

**VBW = 10KHz**

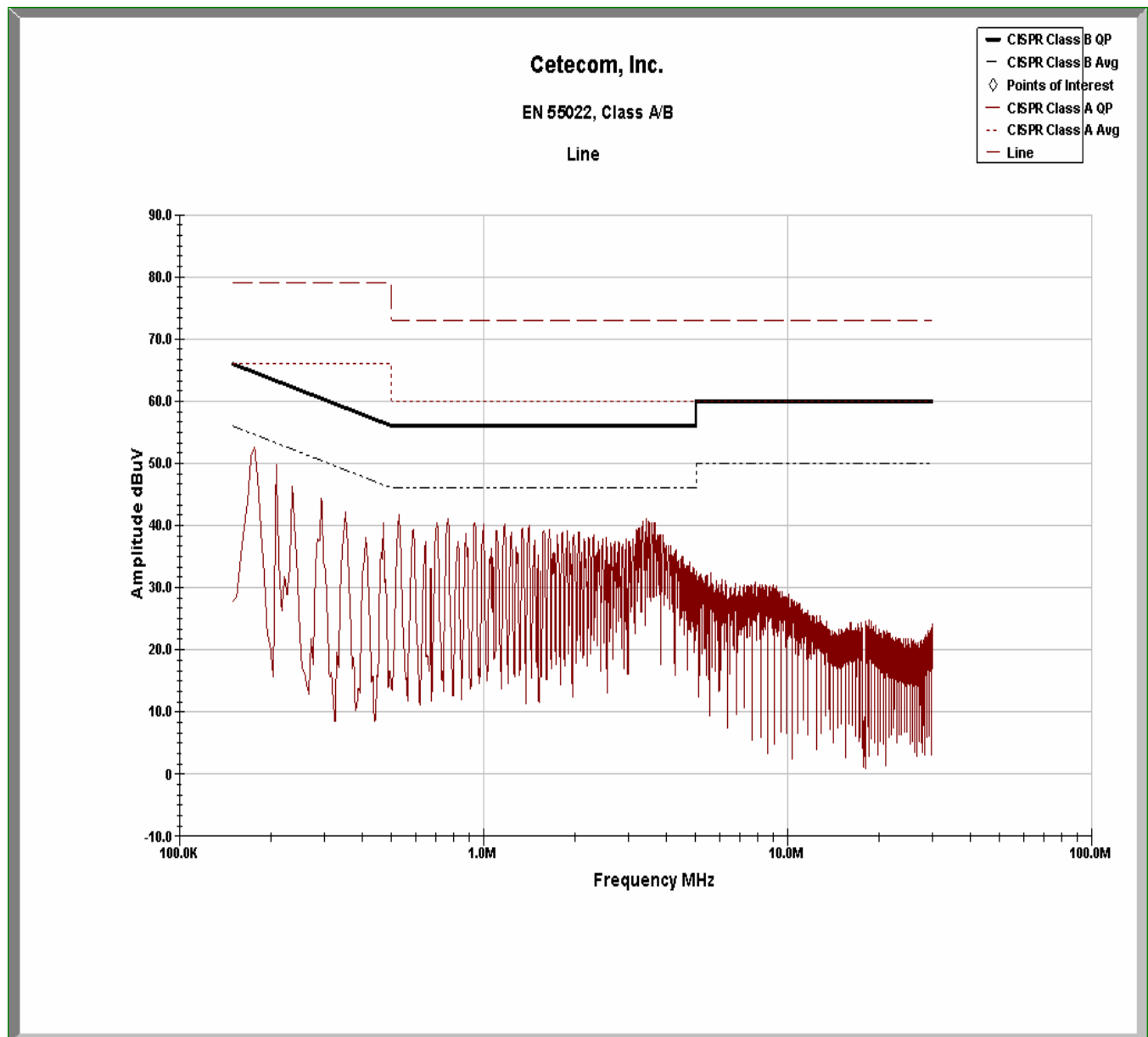
##### **5.4.2 OPERATING MODE**

Conducted AC emissions testing was performed with 110 VAC @ 60 Hz with the EUT in battery charging mode. During the testing an uncharged battery was installed in the EUT.

### 5.4.3 RESULTS

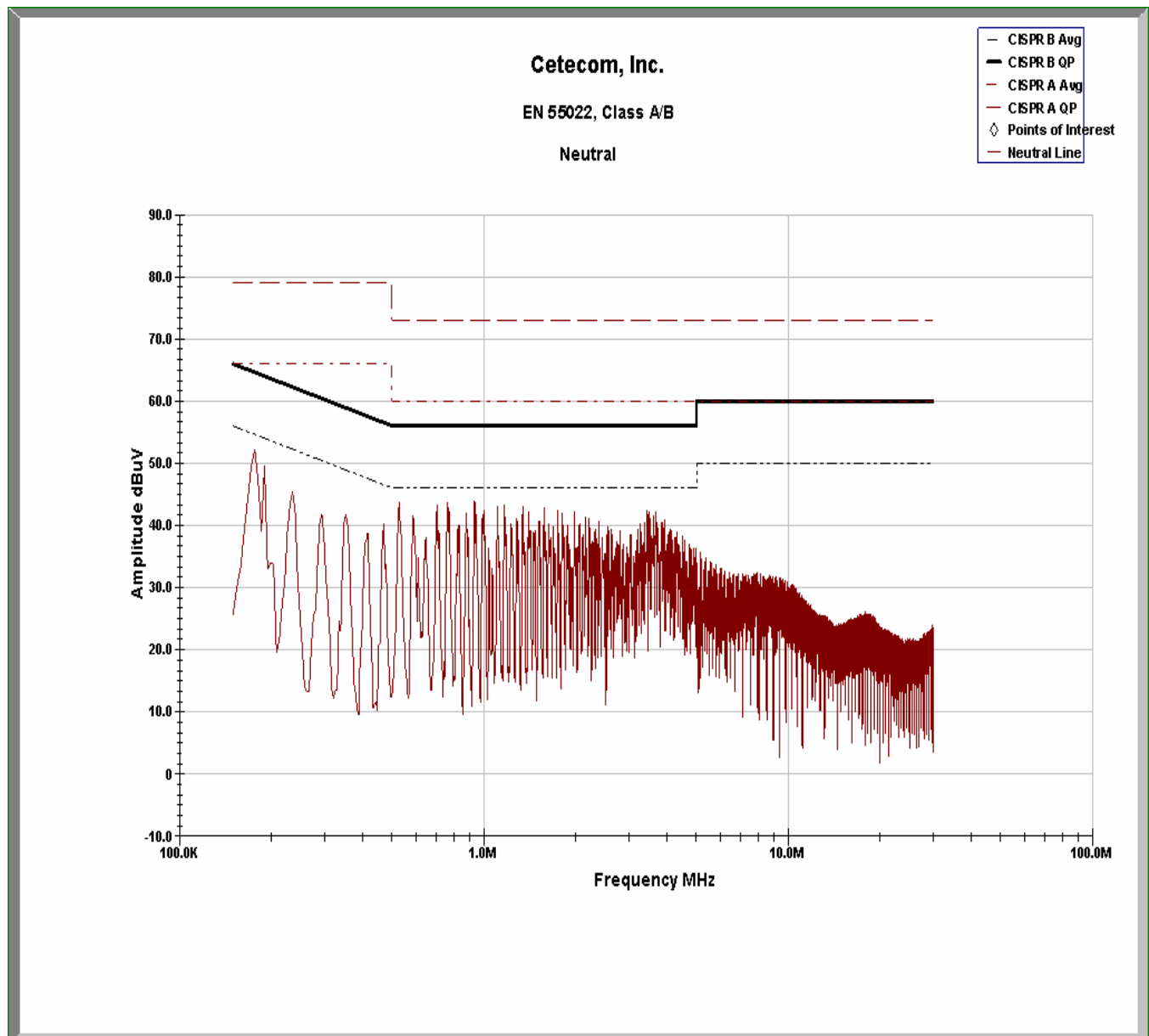
#### Line:

Frequency (MHz)	Level (dBuV)	Detector
0.173	53.30	Peak
0.201	49.99	Peak
0.512	41.66	Peak
1.226	40.72	Peak
1.252	41.05	Peak



**Neutral:**

Frequency (MHz)	Level (dBuV)	Detector
0.173	53.10	Peak
0.512	44.25	Peak
0.701	44.01	Peak
0.770	44.30	Peak
0.911	44.26	Peak



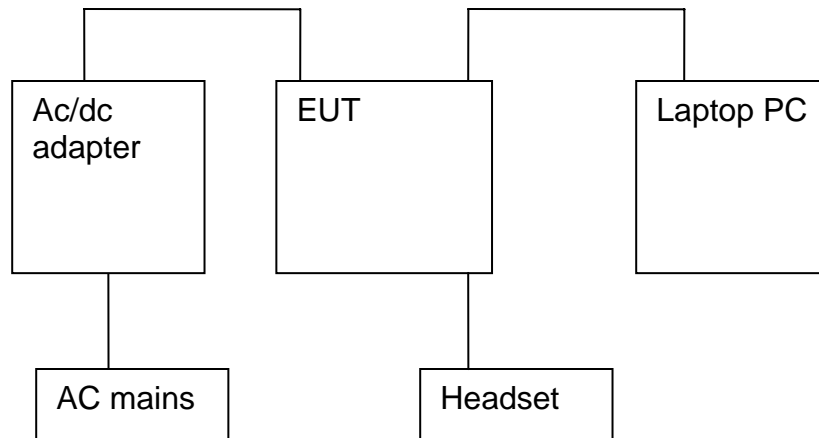
## **6 Test Equipment and Ancillaries Used For Tests**

<b>No</b>	<b>Instrument /Ancillary</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Serial No.</b>	<b>Calibration</b>	<b>Calibration cycle</b>
<b>01</b>	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2006	1 year
<b>02</b>	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	826880/010	August 2006	1 year
<b>03</b>	Biconilog Antenna	3141	EMCO	0005-1186	June 2006	1 year
	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2006	1 year
<b>04</b>	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2006	1 year
<b>5</b>	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	April 2006	1 year

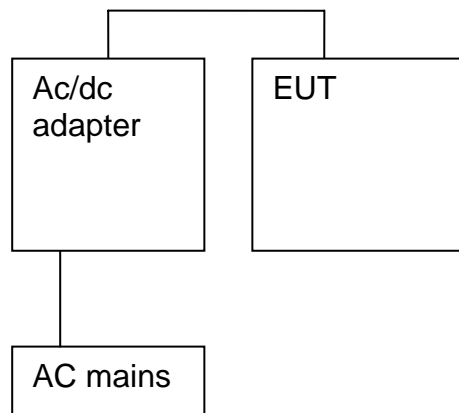


## 6.1 BLOCK DIAGRAMS

Setup#1 data transfer

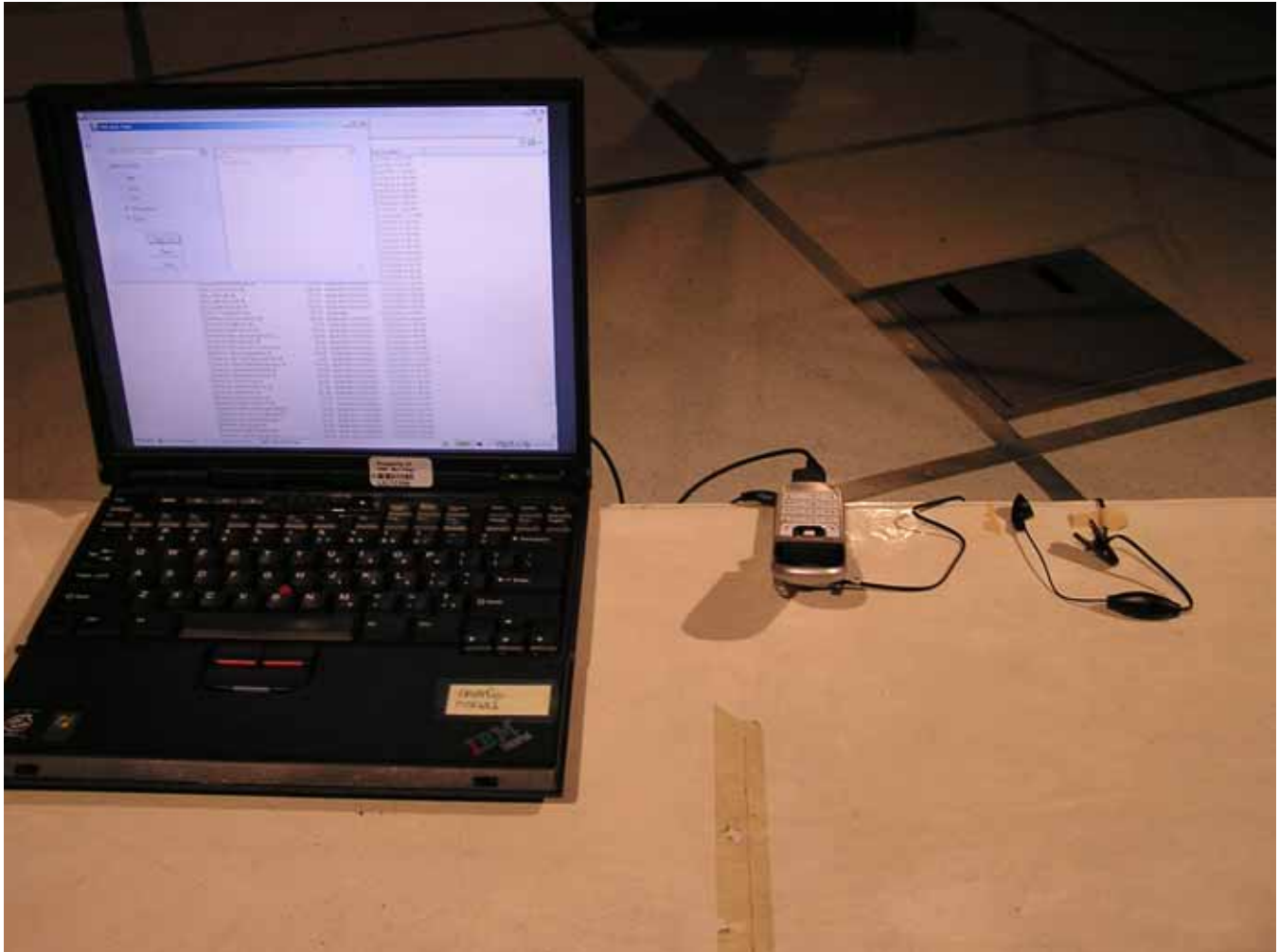


Setup#2 eut charging



## 6.2 TEST SETUP PHOTOS

### SETUP 1 RADIATED EMISSIONS



## SETUP 1 RADIATED EMISSIONS



## SETUP 2 AC LINE CONDUCTION

