



UL International EMC Services
333 Pfingsten Road
Northbrook, Illinois 60062-2096
(800) 873-8536
Fax No. (847) 272-8864
<http://www.ul.com/hitech/emc/>

August 18, 2006

Motorola Inc.
Attn: Mr. Doug Hammers
600 N. US HWY 45
Libertyville, IL 60048
US

UL Reference: File MC15003, Project 06CA39309

Subject: EMC Test and Measurement Report for
Cell Phone, FCC ID - IHDT56GX1

Dear Mr. Hammers:

We have provided with this letter your EMC Test Report for the above referenced model. The product was determined to comply with the requirements noted in the report.

Please review the attached report and direct any questions or comments to me.

We appreciate your interest in UL's EMC Services, and encourage you to contact us in the future should you need EMC test services. This closes Project 06CA39309.

Best regards,

Reviewed by:

A handwritten signature in blue ink, appearing to read 'Lou Madjarov'.

Lou Madjarov (Ext 43957)
EMC Sr. Project Engineer
International EMC Services

A handwritten signature in black ink, appearing to read 'Jack Steiner'.

Jack Steiner
Section Manager
International EMC Services

REPORT DIRECTORY

<u>SECTION</u>	<u>TITLE</u>
----------------	--------------

GENERAL

- | | |
|-----|---|
| 1.0 | General Product Description |
| 1.1 | Model Differences |
| 1.2 | Environmental Conditions in Test Lab |
| 1.3 | Calibration Details of Equipment Used for Measurement |
| 1.4 | EUT (Equipment Under Test) Configuration |
| 1.5 | EUT Operating Mode |
| 1.6 | Device Modifications |

EMISSIONS

- | | |
|-----|-----------------------------------|
| 2.0 | Emissions Test Regulations |
| | Radiated Electric Field Emissions |

IMMUNITY

- | | |
|-----|---------------------------|
| 3.0 | Immunity Test Regulations |
|-----|---------------------------|

CONCLUSION

- | | |
|-----|-----------------|
| 4.0 | General Remarks |
| 4.1 | Summary |

APPENDICIES

- | | |
|---|---|
| A | Test Setups (Photos, Diagrams and Drawings) |
| B | Test Data |
| C | Operating instructions provided by the manufacturer |

1.0 GENERAL PRODUCT DESCRIPTION

The equipment under test (EUT) is a BlueTooth cell phone IHDT56GX1.

1.0.1 Equipment Mobility:

Hand-held

1.0.2 Test Voltage and Frequency:

<u>Voltage (V)</u>	<u>Frequency (Hz)</u>
Cell phone battery	DC

1.1 MODEL DIFFERENCES

Any other model(s) represented by the models tested in this investigation will be documented by the manufacturer.

1.2 ENVIRONMENTAL CONDITIONS IN TEST LAB

Temperature:	20-25 °C
Relative Humidity:	30-60% RH
Atmospheric Pressure:	860-1060 mbar

1.3 CALIBRATION OF EQUIPMENT USED FOR MEASUREMENT

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST), therefore, all test data recorded in this report is traceable to NIST.

Equipment Calibration Data

Manufacturer Name	Item Name Description	Model #	Serial Number	Calibration Date	Calibration Due Date
Hewlett Packard	QP Adapter	85650A	2811A01069	1/06/06	1/06/07
Hewlett Packard	S/A Display	8566B	2542A12974	1/06/06	1/06/07
Hewlett Packard	S/A	8566B	2637A03376	1/06/06	1/06/07
Rohde & Schwartz	S/A	FSEK20	DE2525315	3/15/06	3/15/07
Chase	Bi-Con Antenna 30-300MHz	VBA6106A	1246	7/22/05	7/22/06
Chase	Log-Periodic Antenna	UPA6108	1120	8/2/05	8/2/06
EMCO	Horn Antenna 1-18GHz	3115	2638	7/29/05	7/29/06
EMCO	Horn Antenna 2-4GHz	3161-02	9906-1052	N/A	N/A
EMCO	Horn Antenna 4-8GHz	3161-03	9905-1041	N/A	N/A
EMCO	Horn Antenna 8-12GHz	3160-07	9902-1114	N/A	N/A
EMCO	Horn Antenna 12-18GHz	3160-08	9904-1100	N/A	N/A
EMCO	Horn Antenna 18-26.5GHz	3160-09	990345-003	N/A	N/A
UL	40 GHz BOMS Signal Path	ULBOMS	-	02/2005	02/2007

1.4 EUT CONFIGURATION(s)

See Appendix A for individual set-up configuration(s). In addition to the EUT, the following peripheral devices and/or cables were connected during the measurement:

Phone was tested in battery mode only. No external cables (USB, Headphone or Charger) were attached per manufacturer's request.

Device	Manufacturer	Model	Serial #	FCC ID
EUT	Motorola Corp	-	-	IHDT56GX1

1.5 EUT OPERATING MODE(s)

The equipment under test was operated during the measurements under the following conditions:

- Per manufacturer's request tests were performed in the Bluetooth mode only. See Appendix C for manufacturer's provided instructions for configuring the phone to operate in this mode.
- Tests were performed at low, mid and high channels.
- Tests were performed with EUT orientated along X, Y and Z orthogonal axis.

1.6 DEVICE MODIFICATIONS

The following modifications were necessary for compliance:

None

2.0 EMISSIONS TEST REGULATIONS

Per the manufacturer's specifications the following test were performed according to the following regulations:

- The **spurious radiated emission** requirements of paragraph **15.247(d) of CFR47 Part 15 2006**, specifically "radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
- Per manufacturer's request 30 to 1000MHz, 1 to 26GHz and band-edge measurements were performed.
- Additional guidance was obtained from FCC Document, DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems Released March 30, 2000

RADIATED ELECTRIC FIELD EMISSIONS, 30 TO 1000MHzTest Location

10 Meter Semi-Anechoic Chamber

UL Procedure

Northbrook Work Instruction for Measurement of Radiated Emissions (EMC)
08-CA-W0030

Test InstrumentsSpectrum Analyzer / Quasi-peak Adapter / Preamplifier

Hewlett Packard Model 8566B Spectrum Analyzer	EMC4085
Model 85650A Quasi-peak Adapter	EMC4016
Miteq AM-3A-000110-N Preamp	EMC4151

Antennas

Chase EMC Ltd., Biconical Antenna Model VBA6106A	S/N 1246	EMC4078
Chase EMC Ltd., Log Periodic Antenna Model UPA6108	S/N 1120	EMC4076

Frequency Range of Measurement

30MHz-1000MHz

Measurement Distance

10 meters, 30MHz-1000MHz

Test Results

The requirements are:
MET

Remarks

See App. B for complete test results.

RADIATED ELECTRIC FIELD EMISSIONS, 1 TO 25 GHz BAND-EDGE MEASUREMENTS

Test Location

10 Meter Semi-Anechoic Chamber

UL Procedure

Northbrook Work Instruction for Measurement of Radiated Emissions (EMC)
08-CA-W0030

Test Instruments

Spectrum Analyzer

Rhode & Schwarz, Spectrum Analyzer, 9kHz-40GHz, EMC 4182
UL BOMS Signal Path

Antennas

Emco	Double-Ridge Guide Horn	3115	EMC 4033
Emco	Horn Antenna 2-4GHz	3161-02	9906-1052
Emco	Horn Antenna 4-8GHz	3161-03	9905-1041
Emco	Horn Antenna 8-12GHz	3160-07	9902-1114
Emco	Horn Antenna 12-18GHz	3160-08	9904-1100
Emco	Horn Antenna 18-26.5GHz	3160-09	990345-003

Frequency Range of Measurement

1 to 26 GHz

Measurement Distance

3 meters

Test Results

The requirements are:
MET

Remarks

See App. B for complete test results.

Preliminary peak scans were performed in low, mid and high channels as well as with EUT configured along X, Y and Z orthogonal axis. Final maximized (azimuth and height) measurements were then performed under worst-case configuration as determined during preliminary measurement.

3.0 IMMUNITY TEST REGULATIONS

Immunity testing was not performed per the request of the manufacturer nor required by CFR 47, Part 15.

4.0 GENERAL REMARKS

Sample Receipt Date : July 18, 2006

Test Dates

Start : July 18, 2006

End : July 19, 2006

4.1 SUMMARY

The requirements according to the technical regulations are:

MET

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062 USA

Test Engineer:



Lou Madjarov (Ext 43957)
EMC Sr. Project Engineer
International EMC Services

Reviewed by:



Jack Steiner
Section Manager
International EMC Services

APPENDIX A

PHOTOS



Radiated Emissions
X-Axis

Not actual phone shown but
representative of EUT test
configuration.

Manufacturer will provide
required photos separately.



Radiated Emissions
Y-Axis



Radiated Emissions
Z-Axis

APPENDIX B

TEST DATA

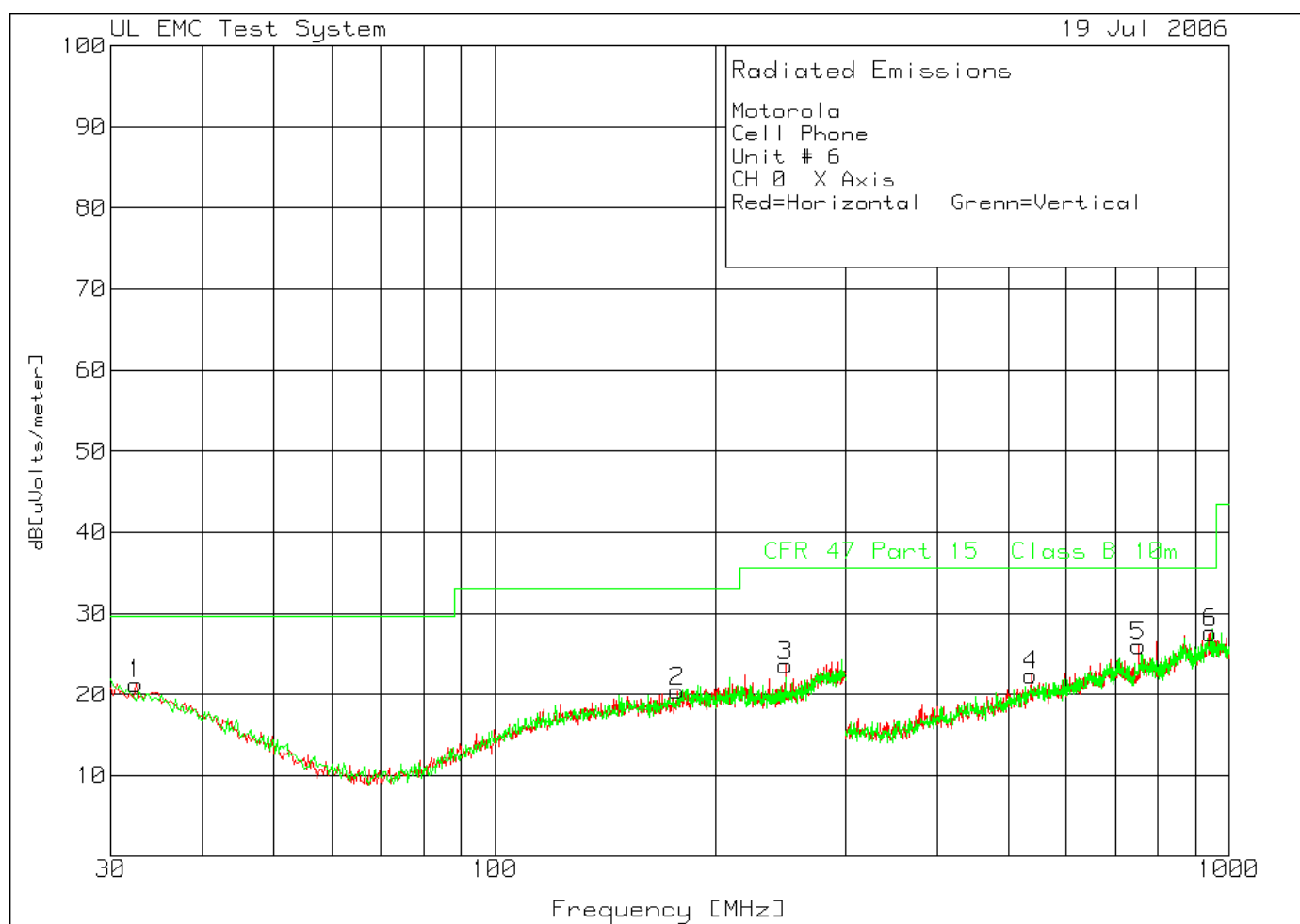
EMISSIONS

Radiated Electric Field Emissions

UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 19 July 2006

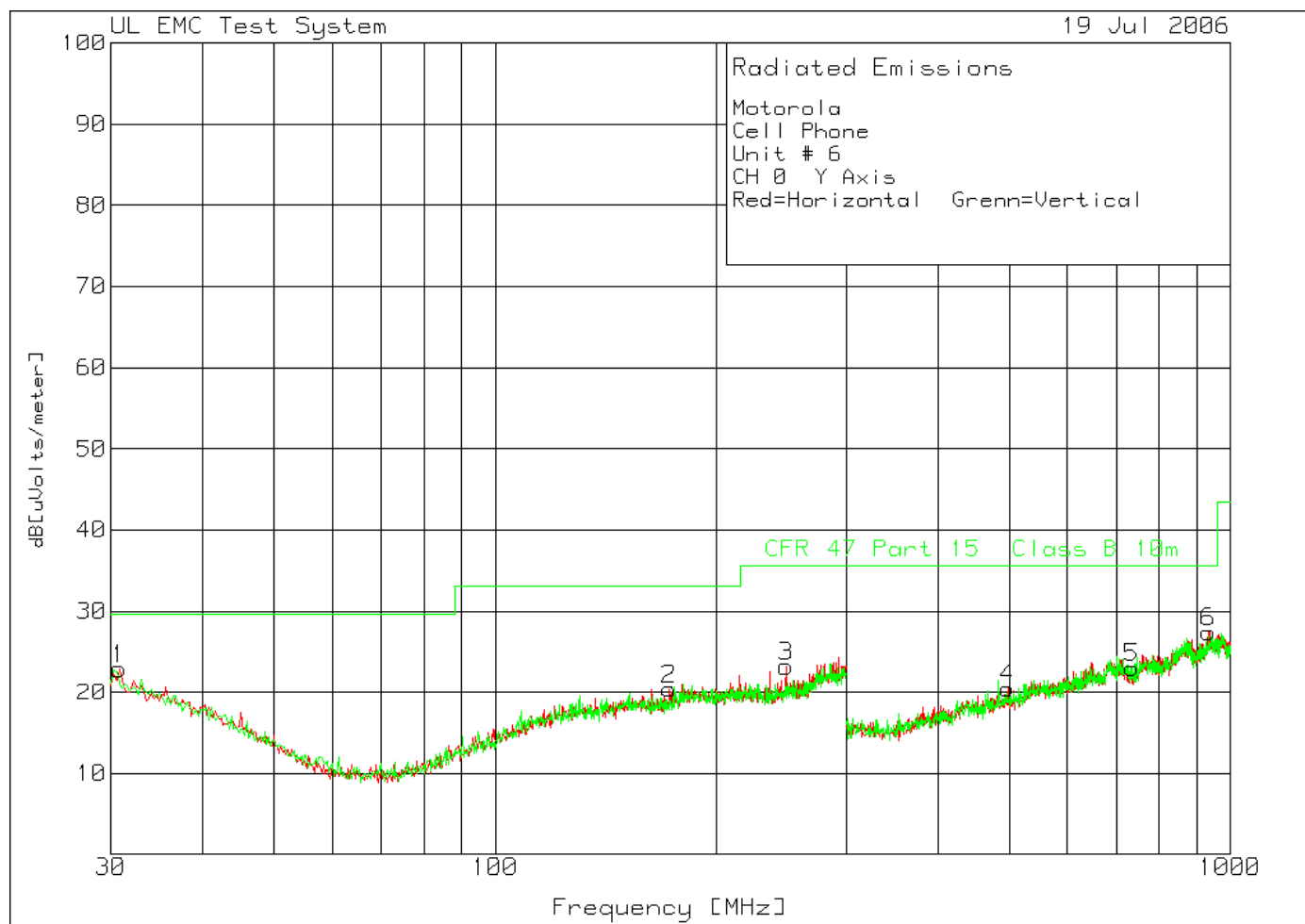
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 19 July 2006

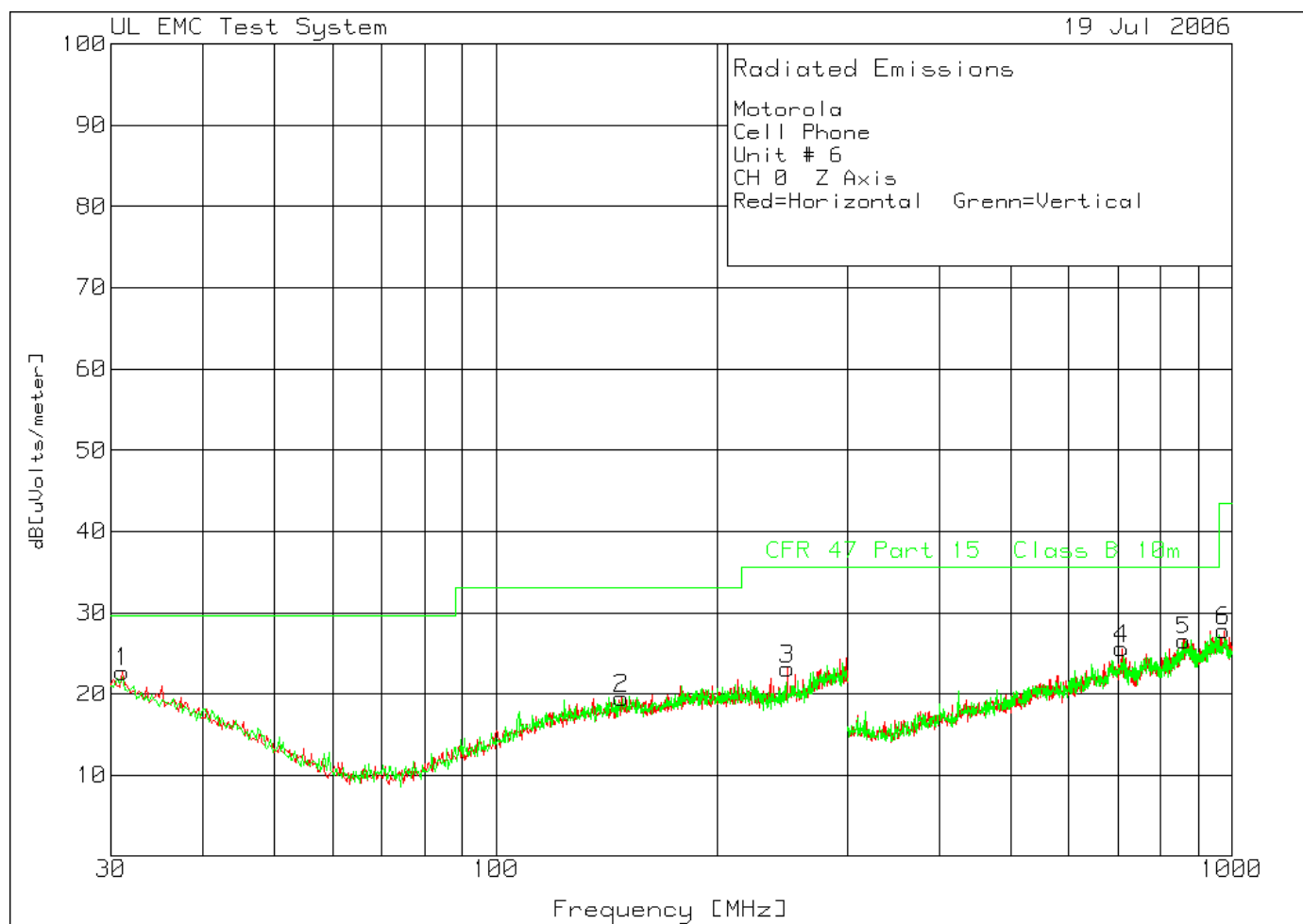
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.**Radiated Emissions**

Date Tested: 19 July 2006

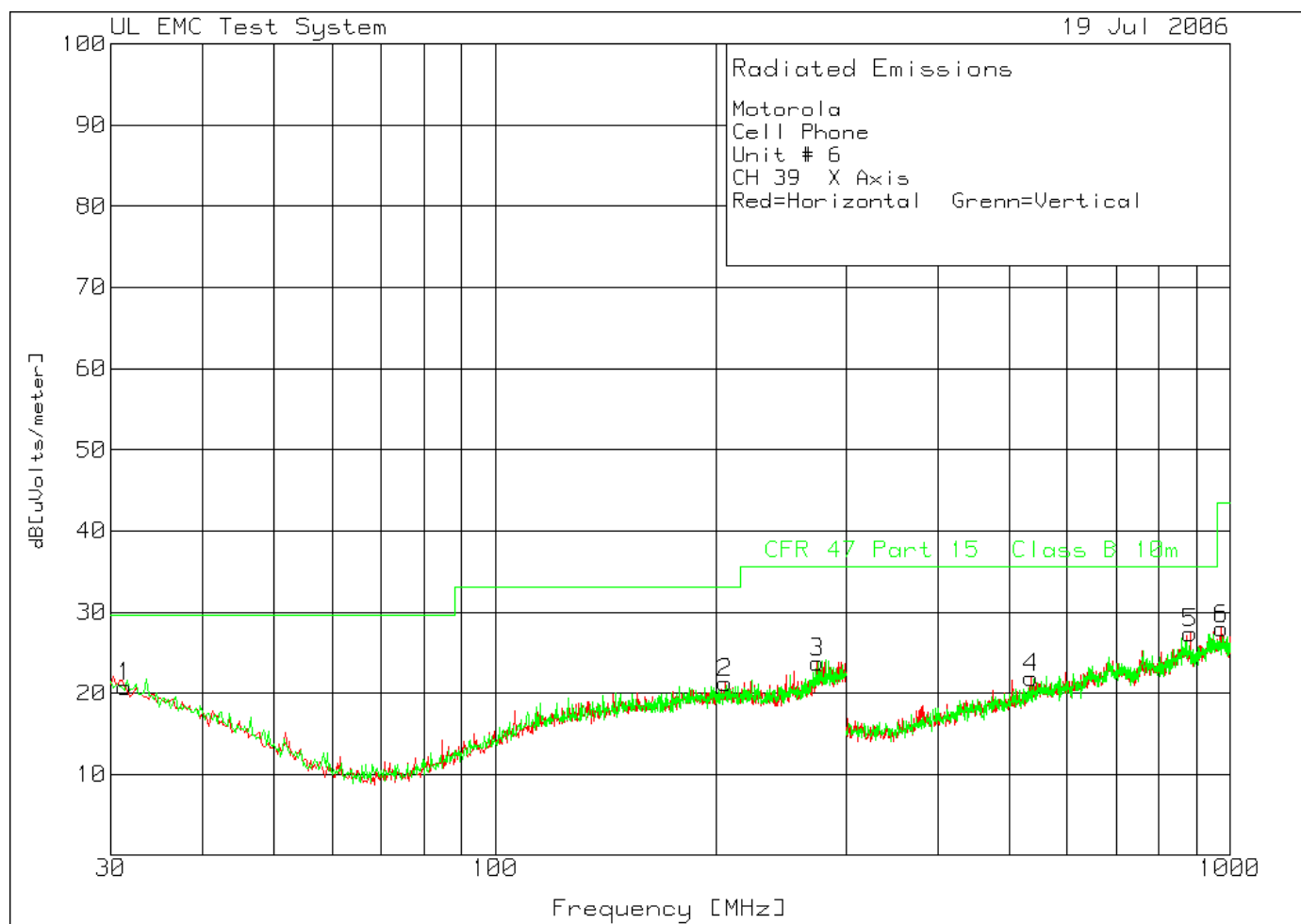
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.

Date Tested: 19 July 2006

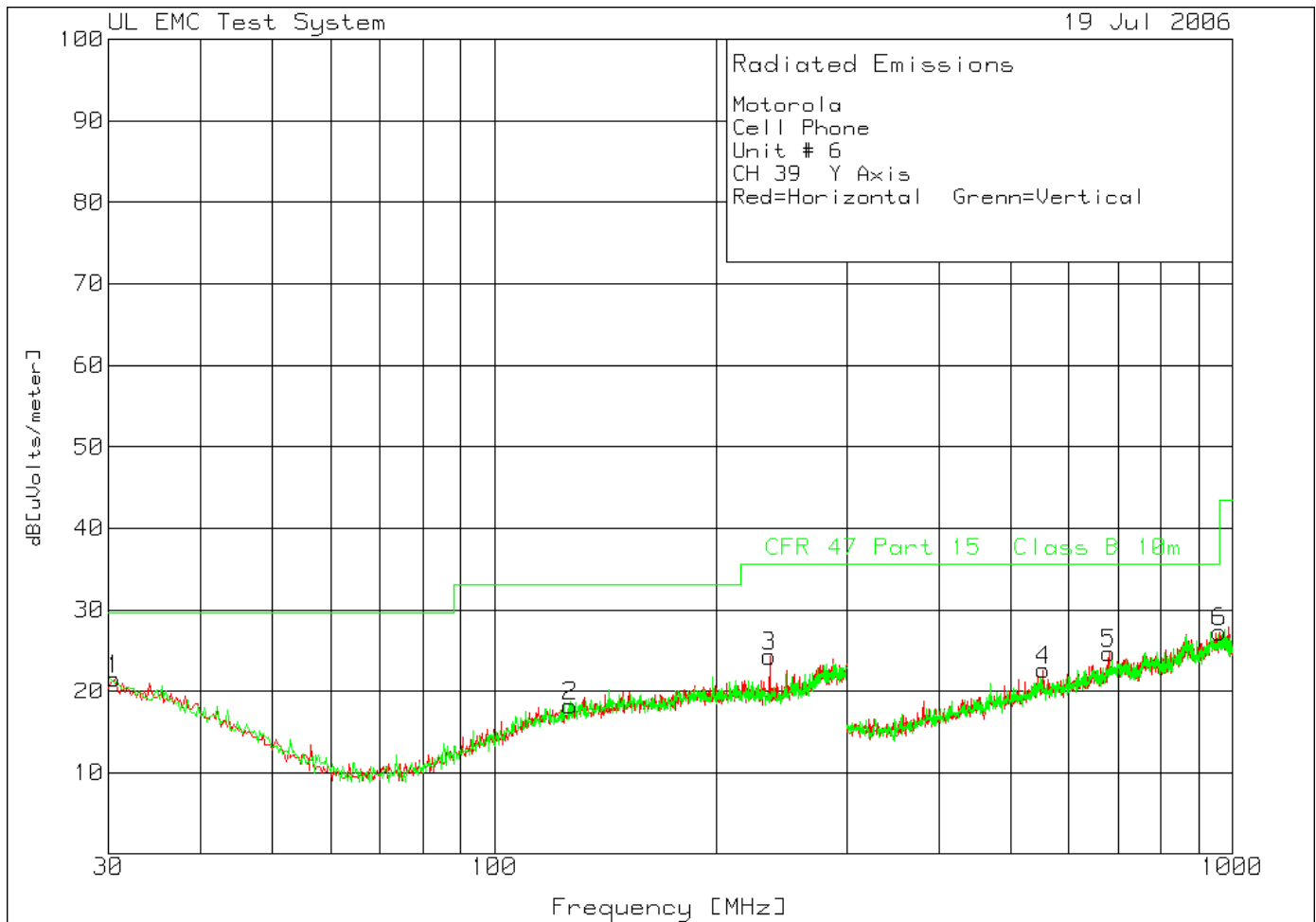
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC. **Radiated Emissions**

Date Tested: 19 July 2006

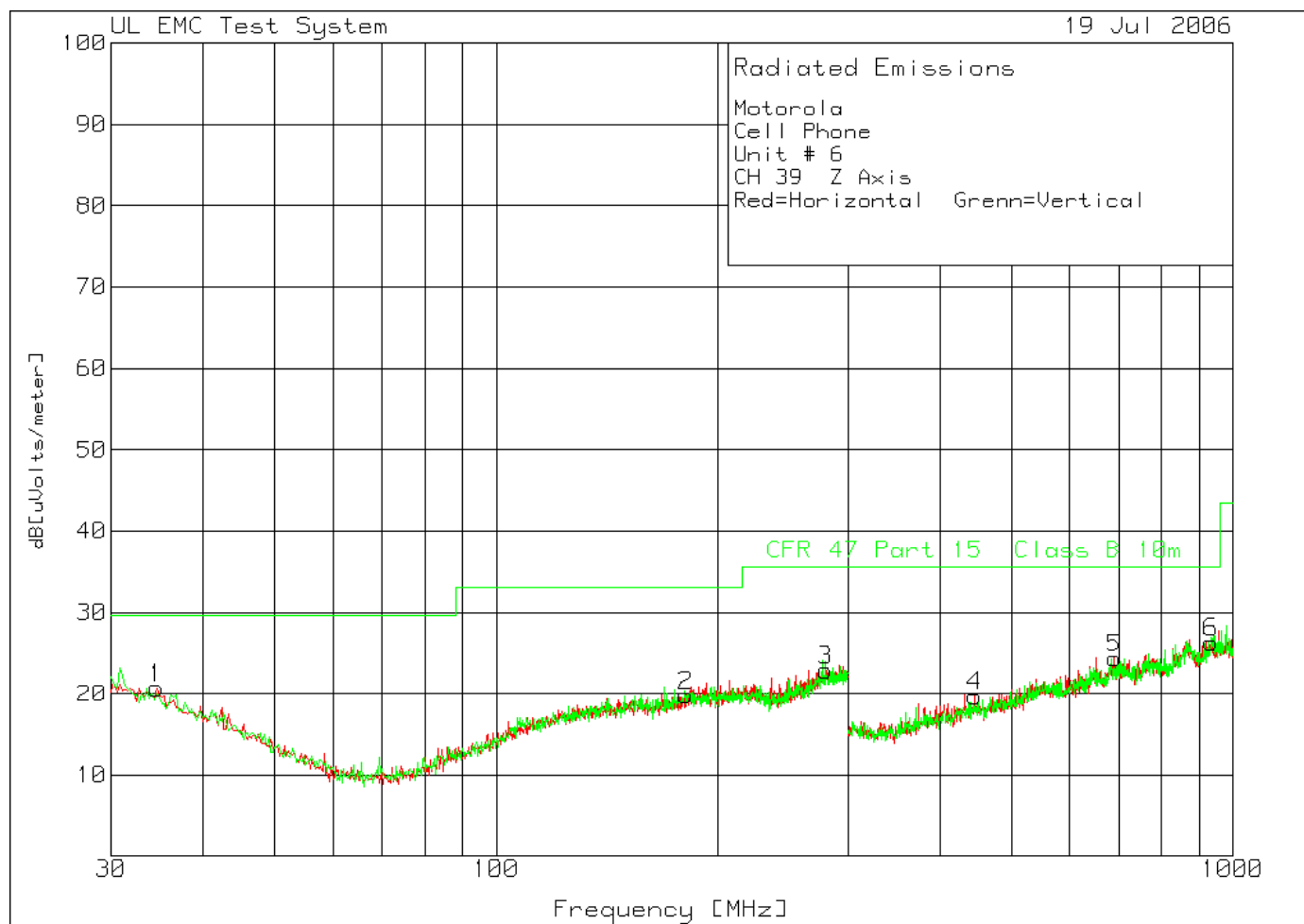
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 19 July 2006

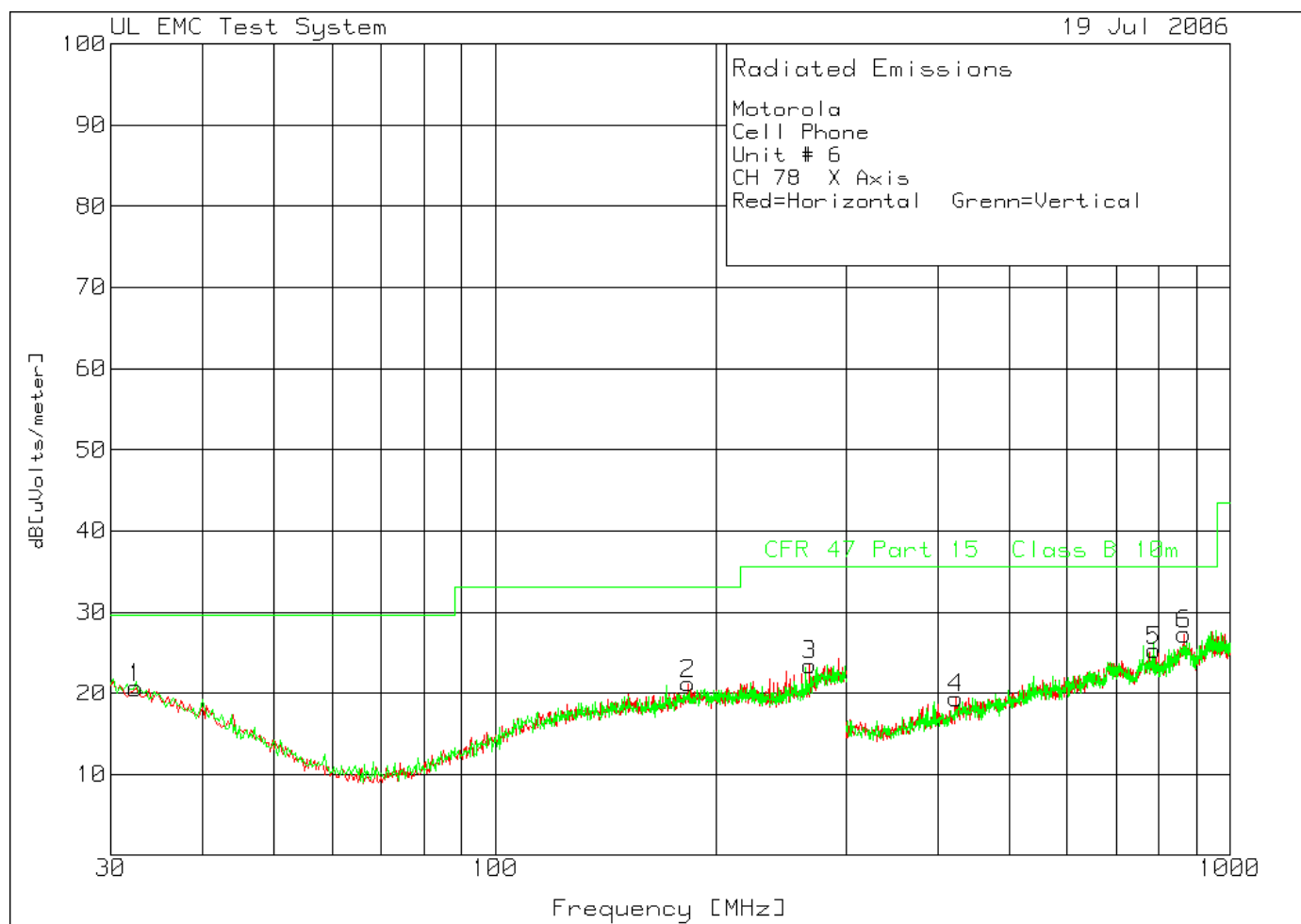
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.**Radiated Emissions**

Date Tested: 19 July 2006

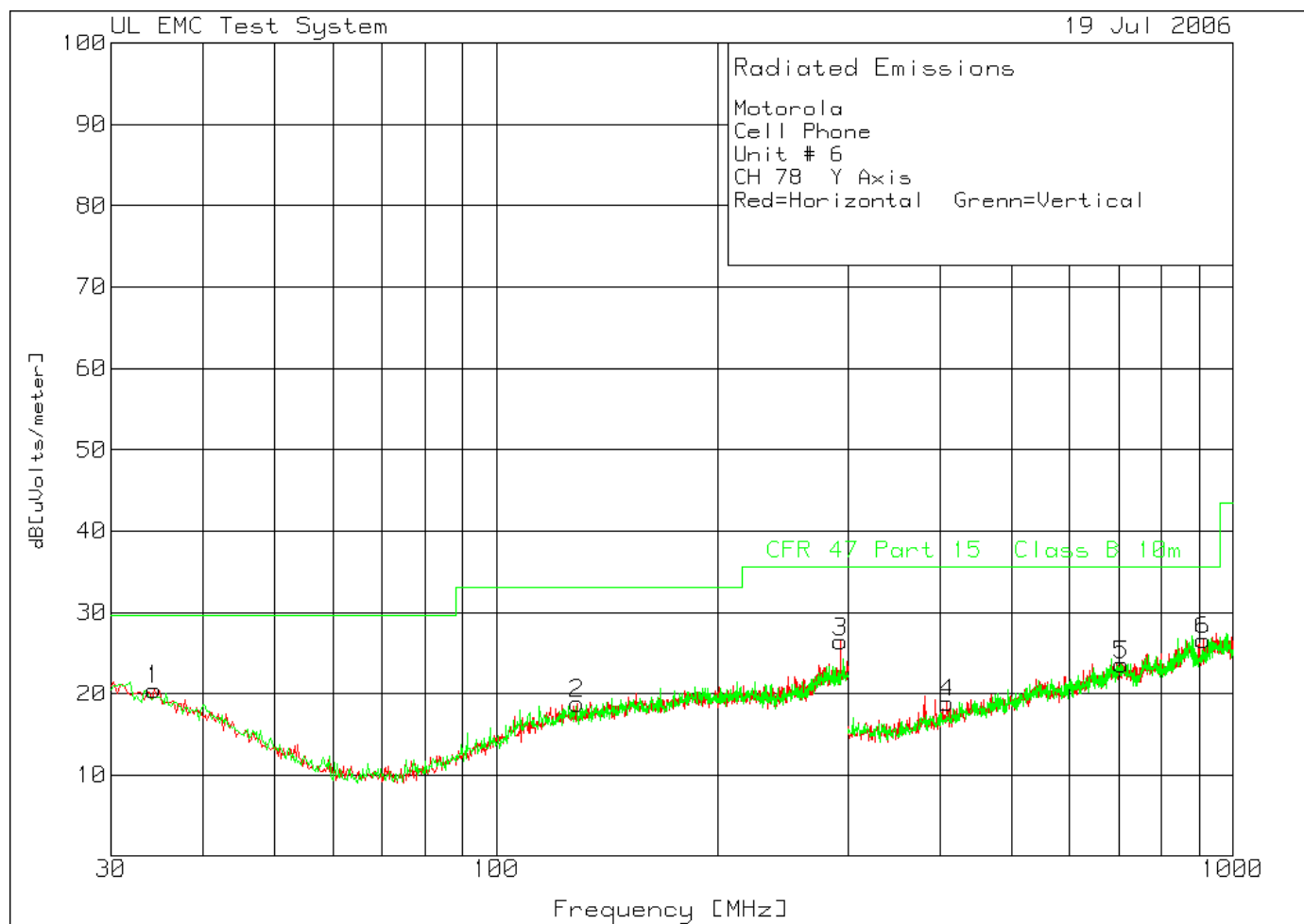
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 19 July 2006

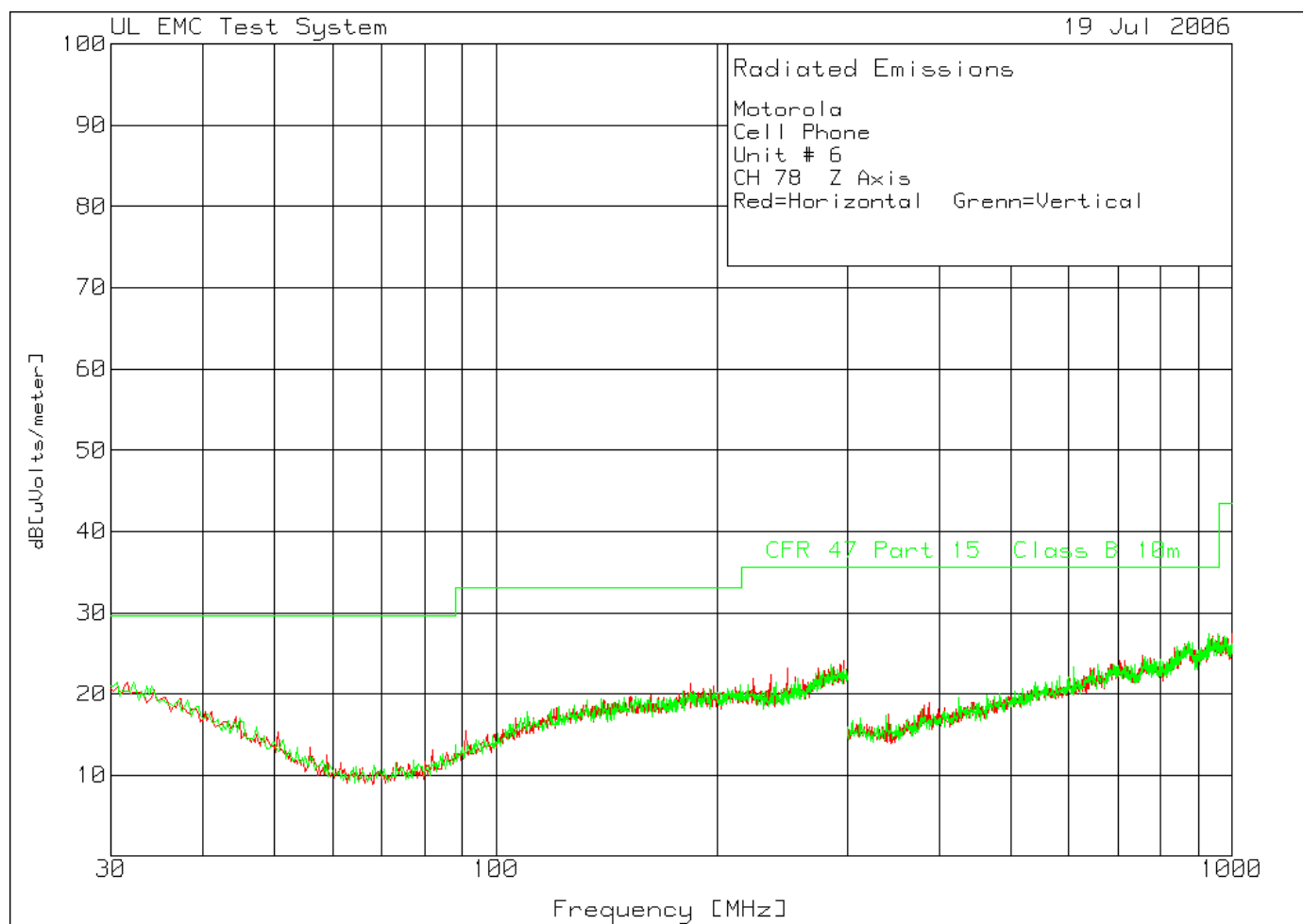
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.**Radiated Emissions**

Date Tested: 19 July 2006

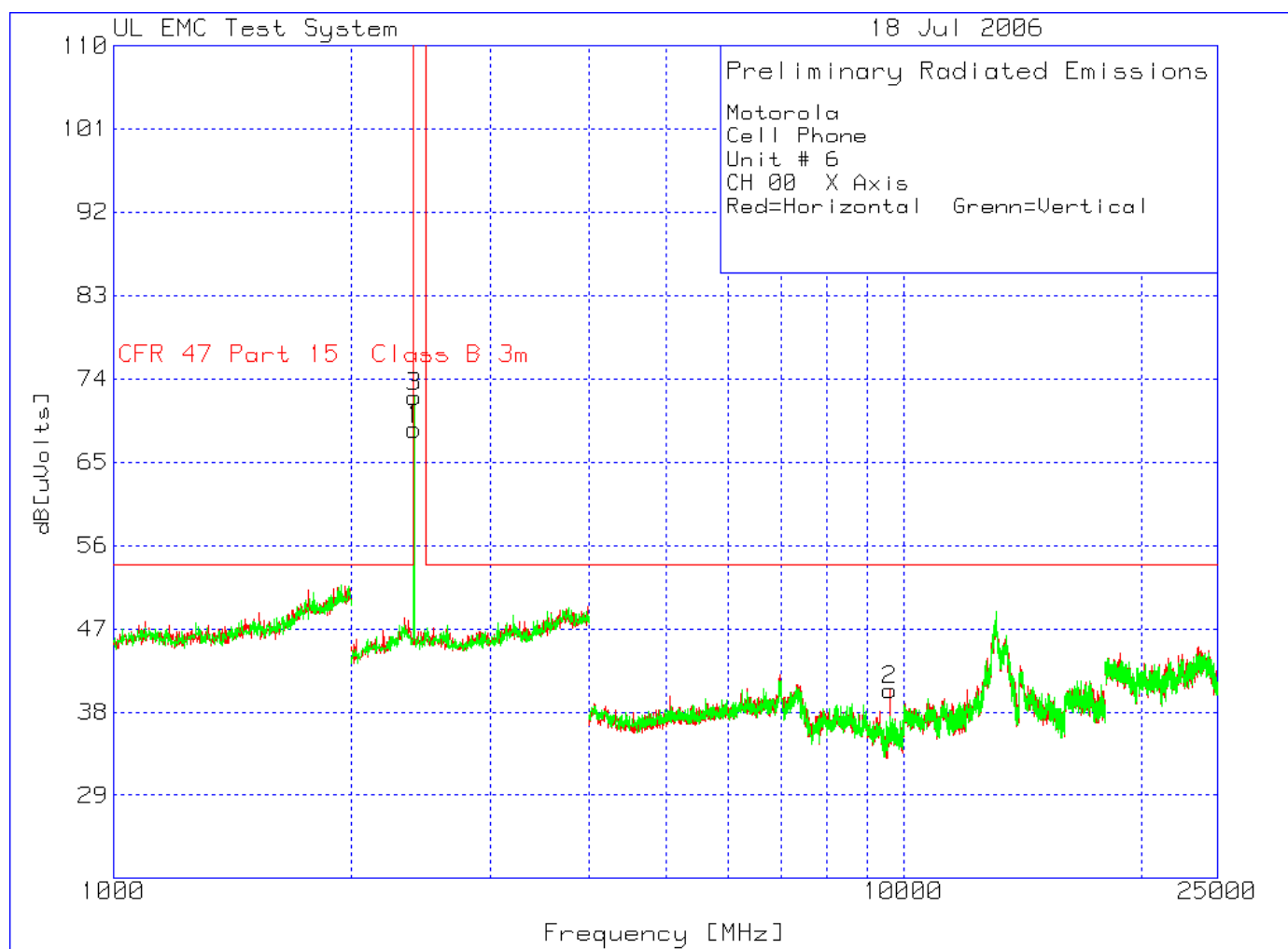
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 MHz, Biconical
 300 - 1000 MHz, Log-Periodic



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

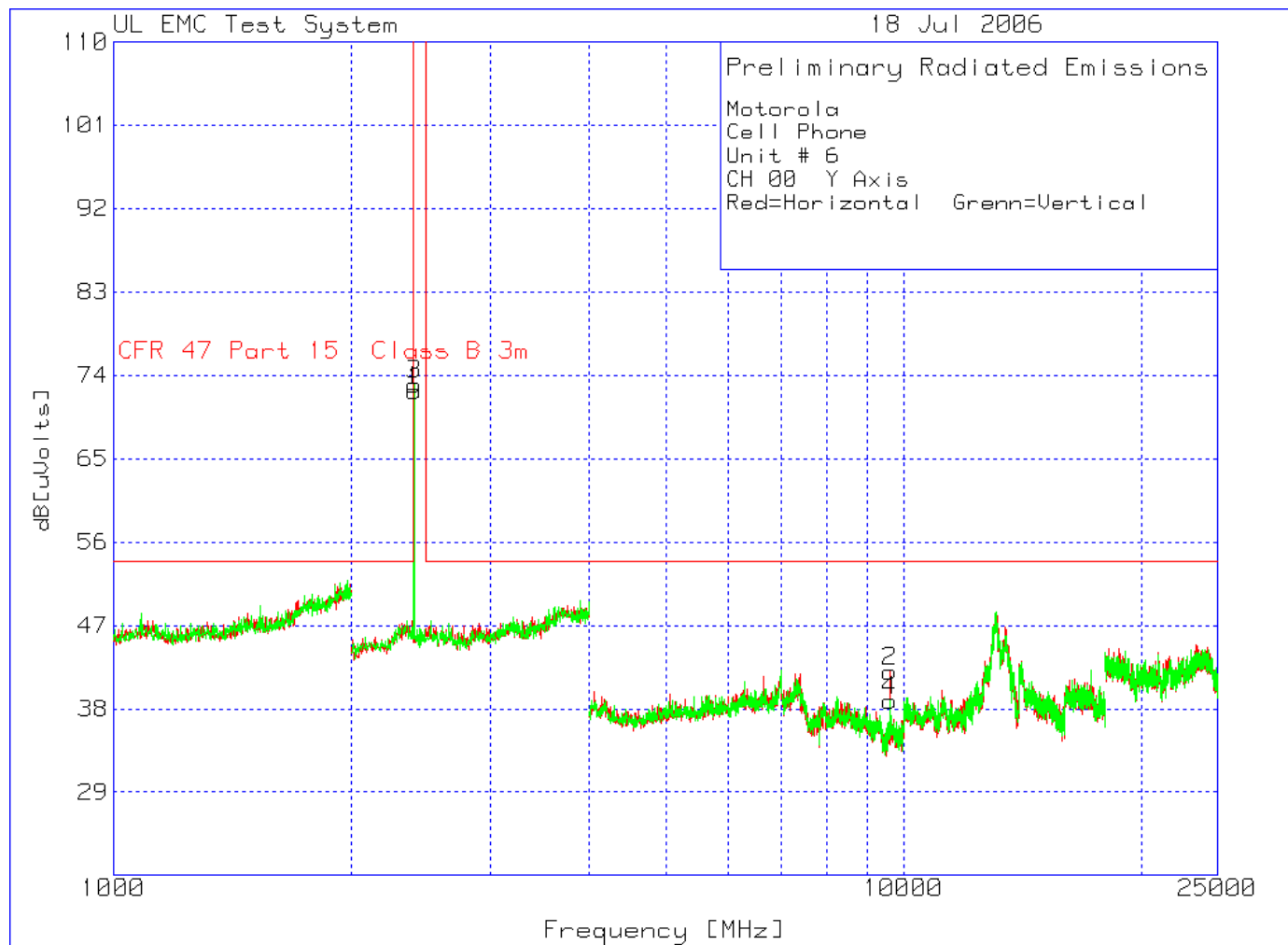
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

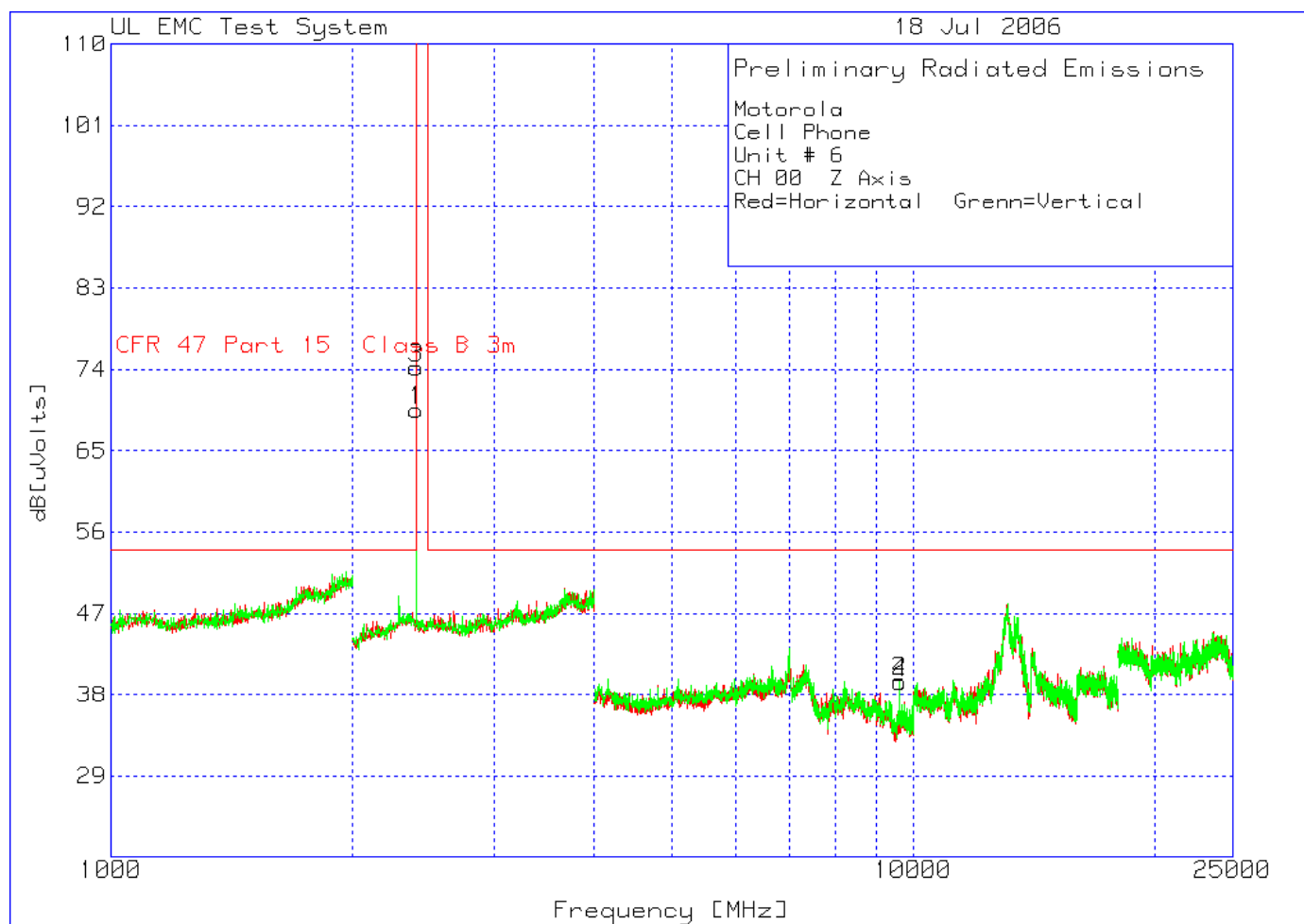
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

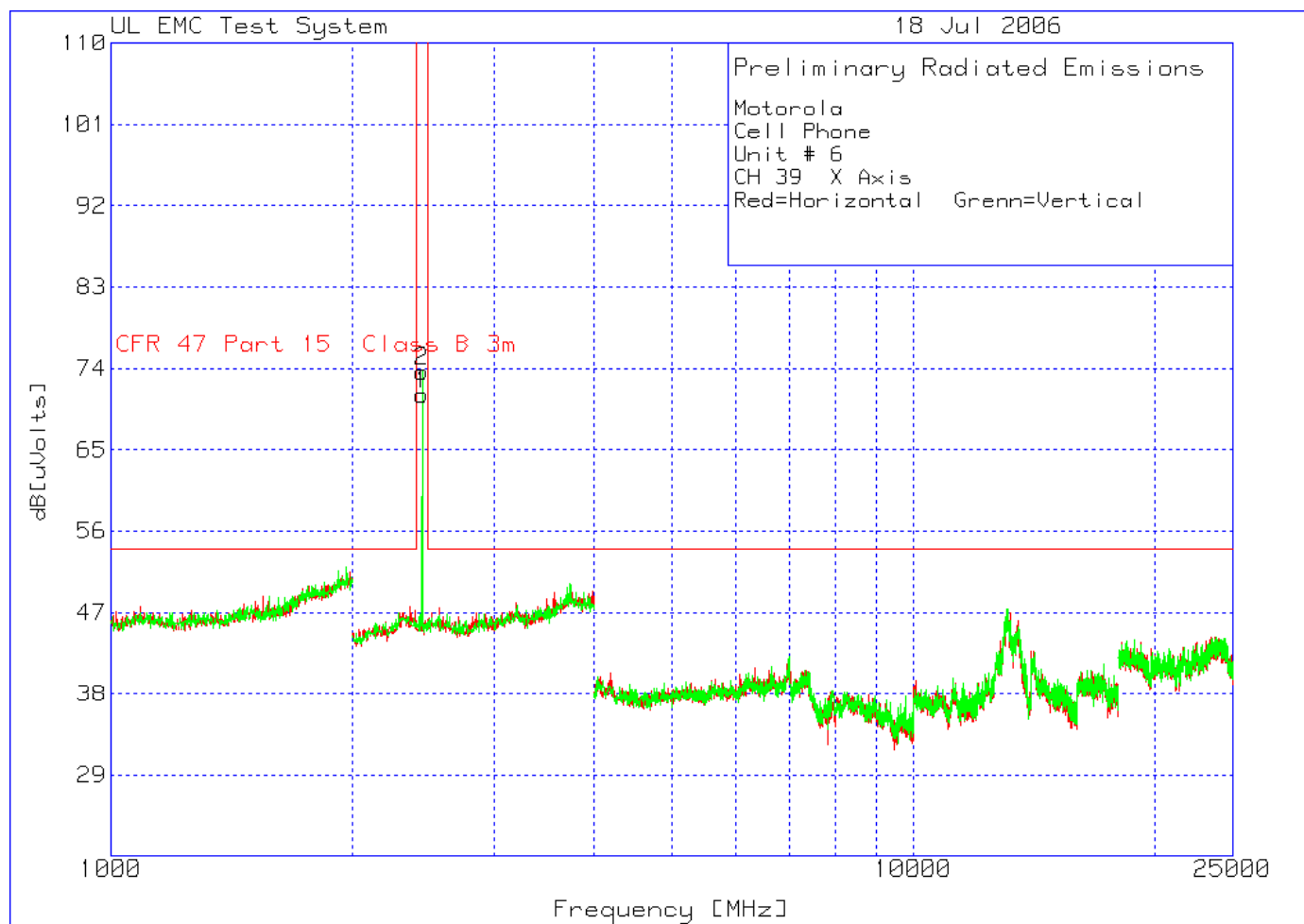
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

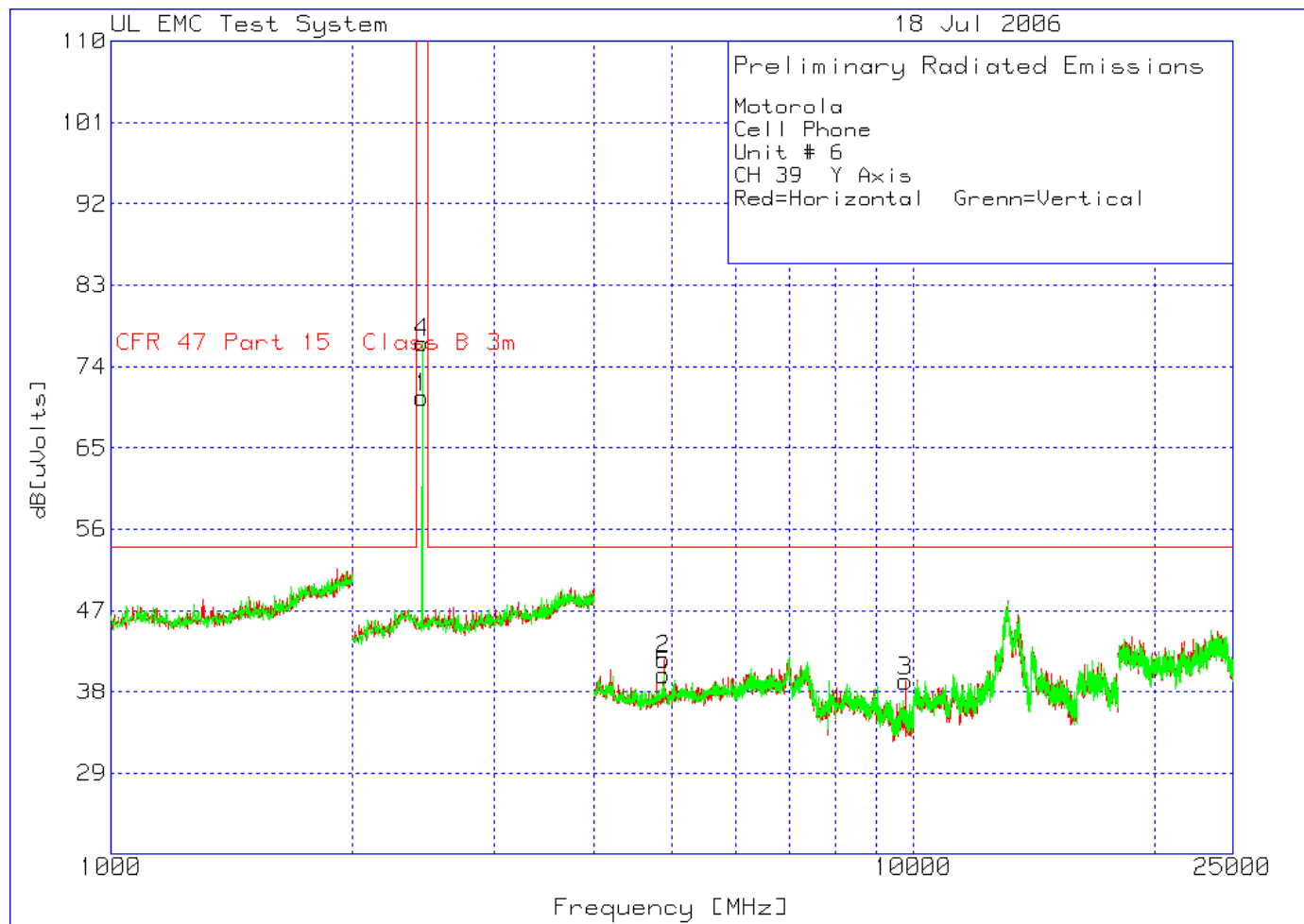
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC. Radiated Emissions

Date Tested: 18 July 2006

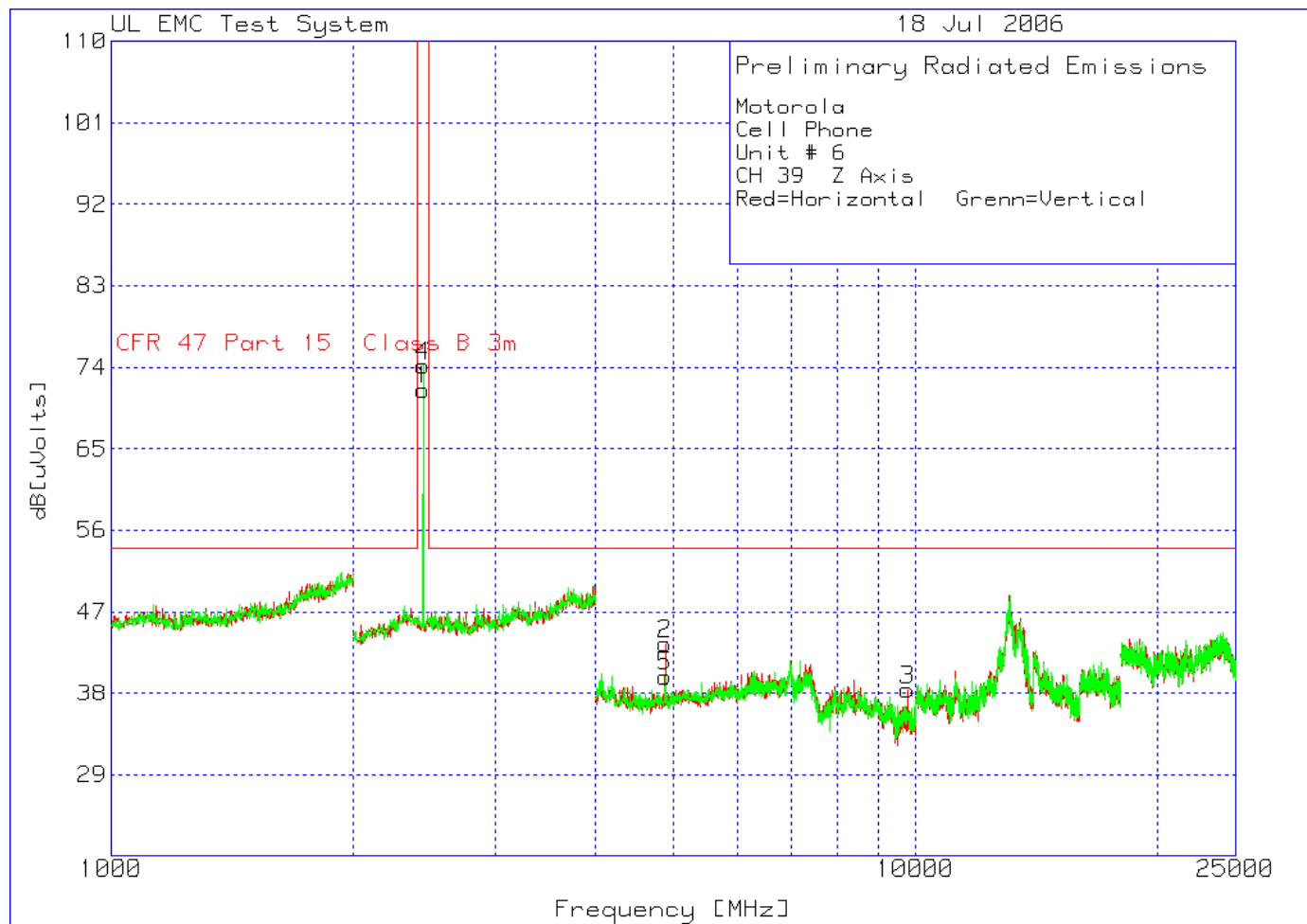
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC. **Radiated Emissions**

Date Tested: 18 July 2006

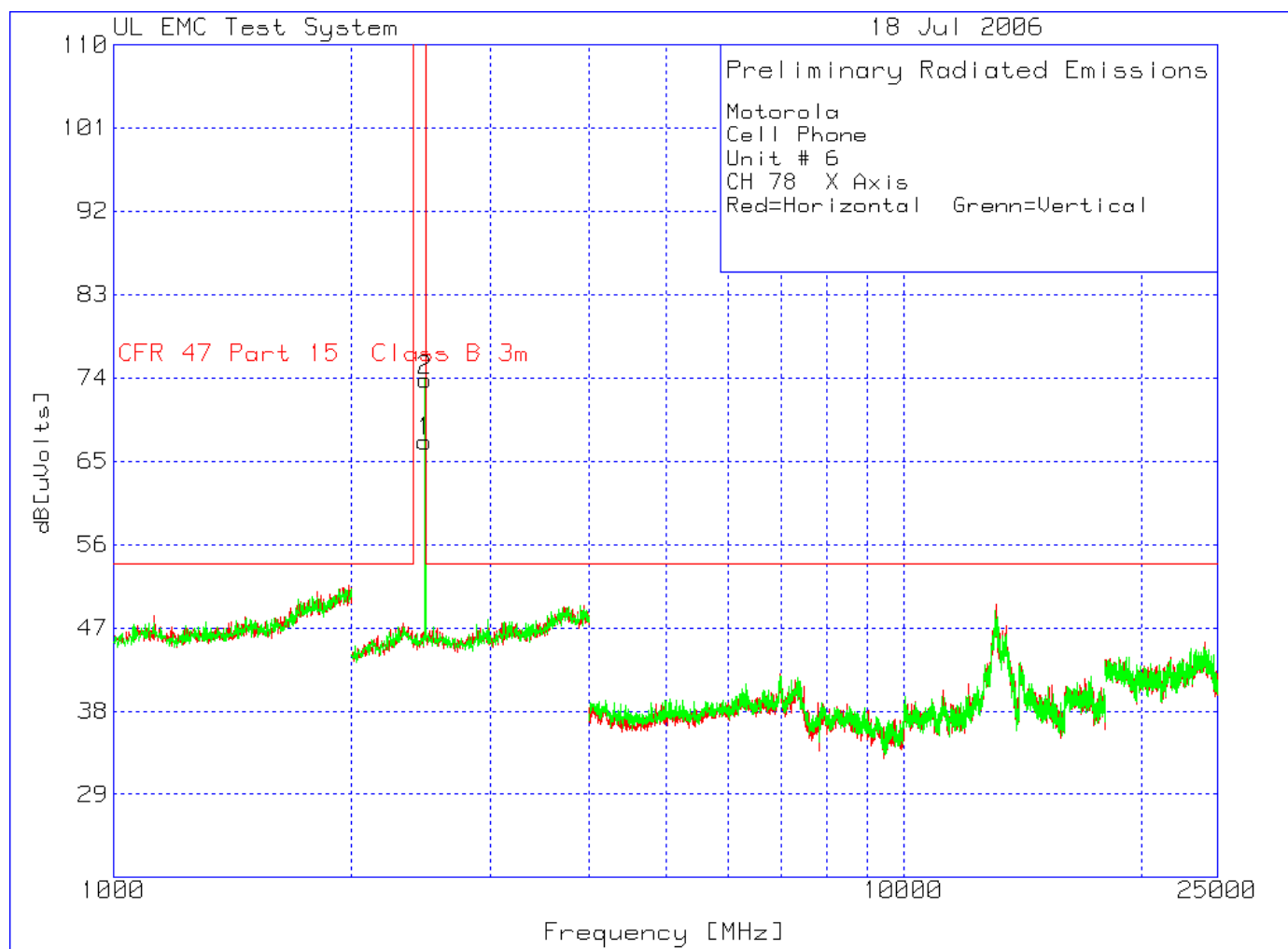
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

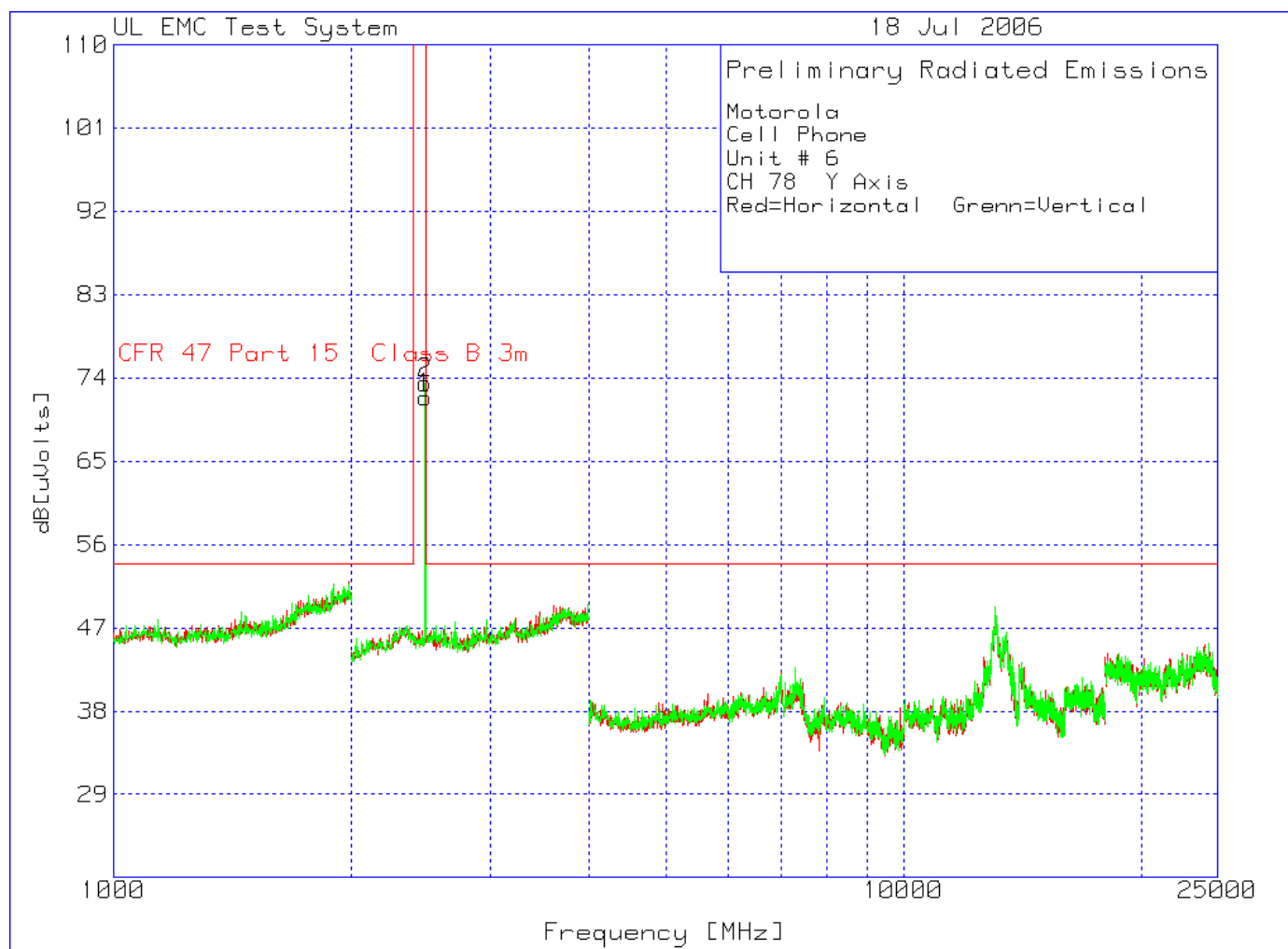
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

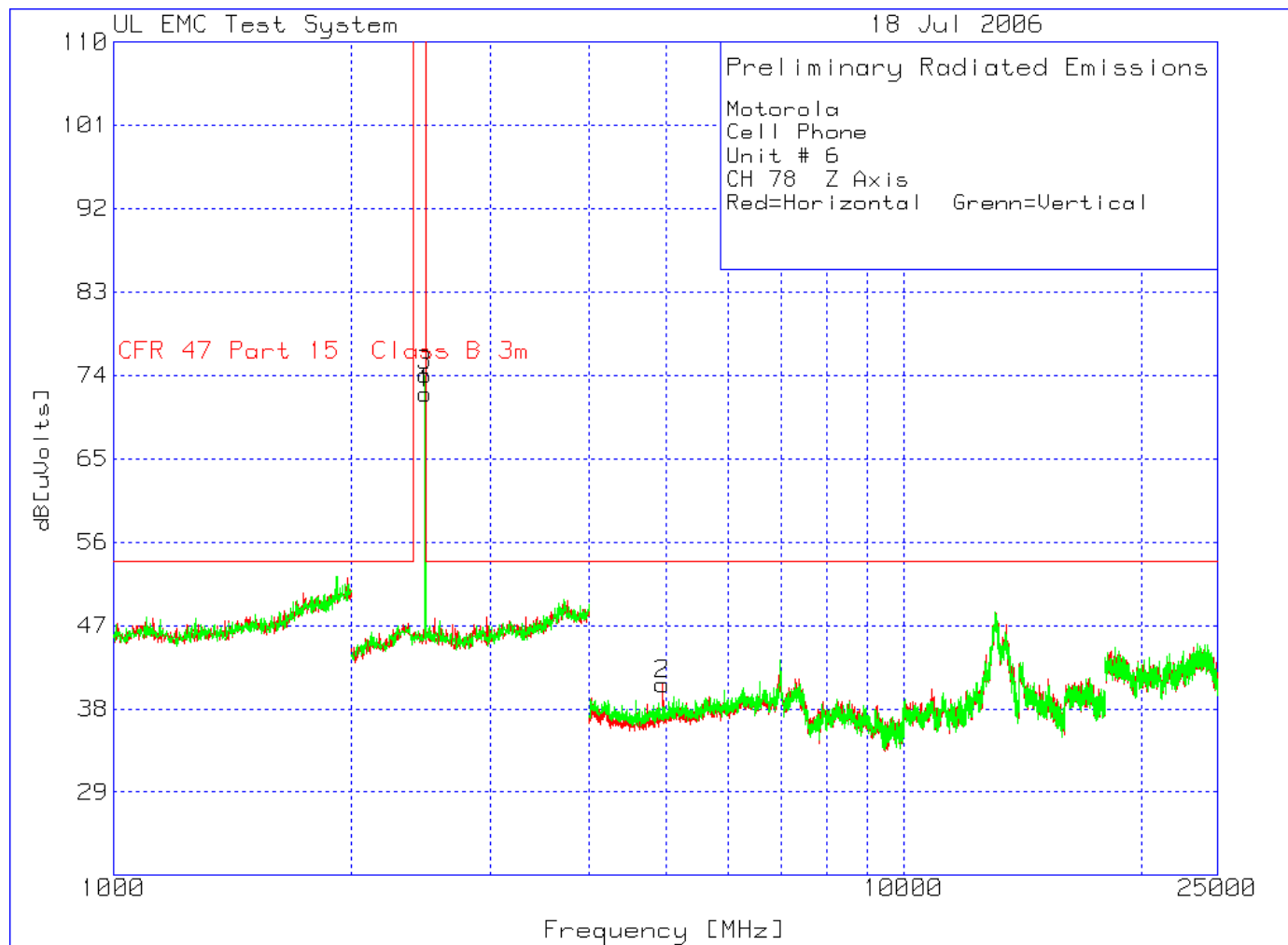
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn Antenna Array



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

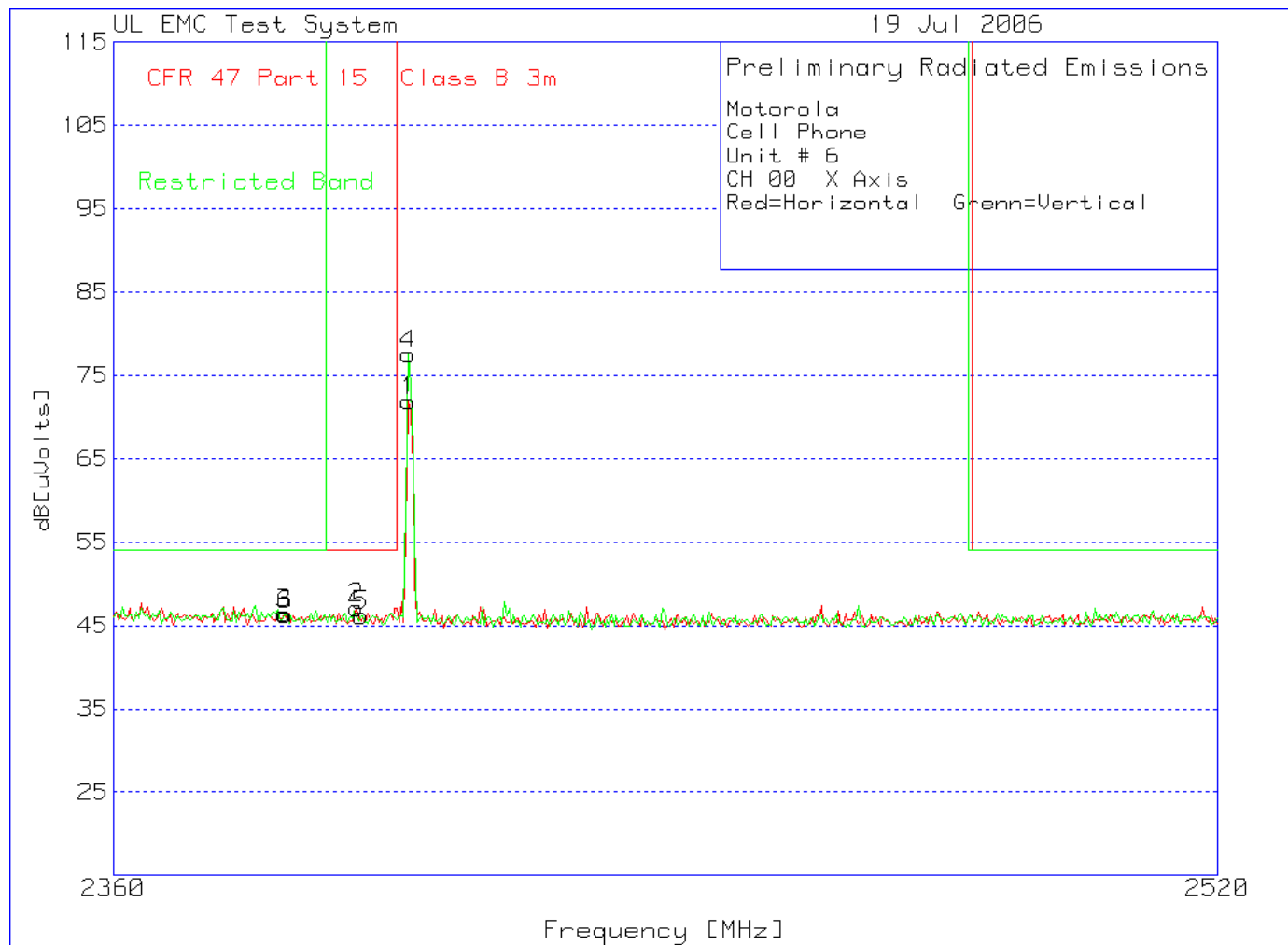
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone
Requirement : CFR 47 Part 15 Class B
Detection Mode : Average (VBW=10Hz)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 1-25GHz Horn

Preliminary peak scans were performed in low, mid and high channels as well as with EUT configured along X, Y and Z orthogonal axis. Final maximized (azimuth and height) average measurements were not considered necessary as preliminary peak measurements were greater than 6dB under the FCC limit.

UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 19 July 2006

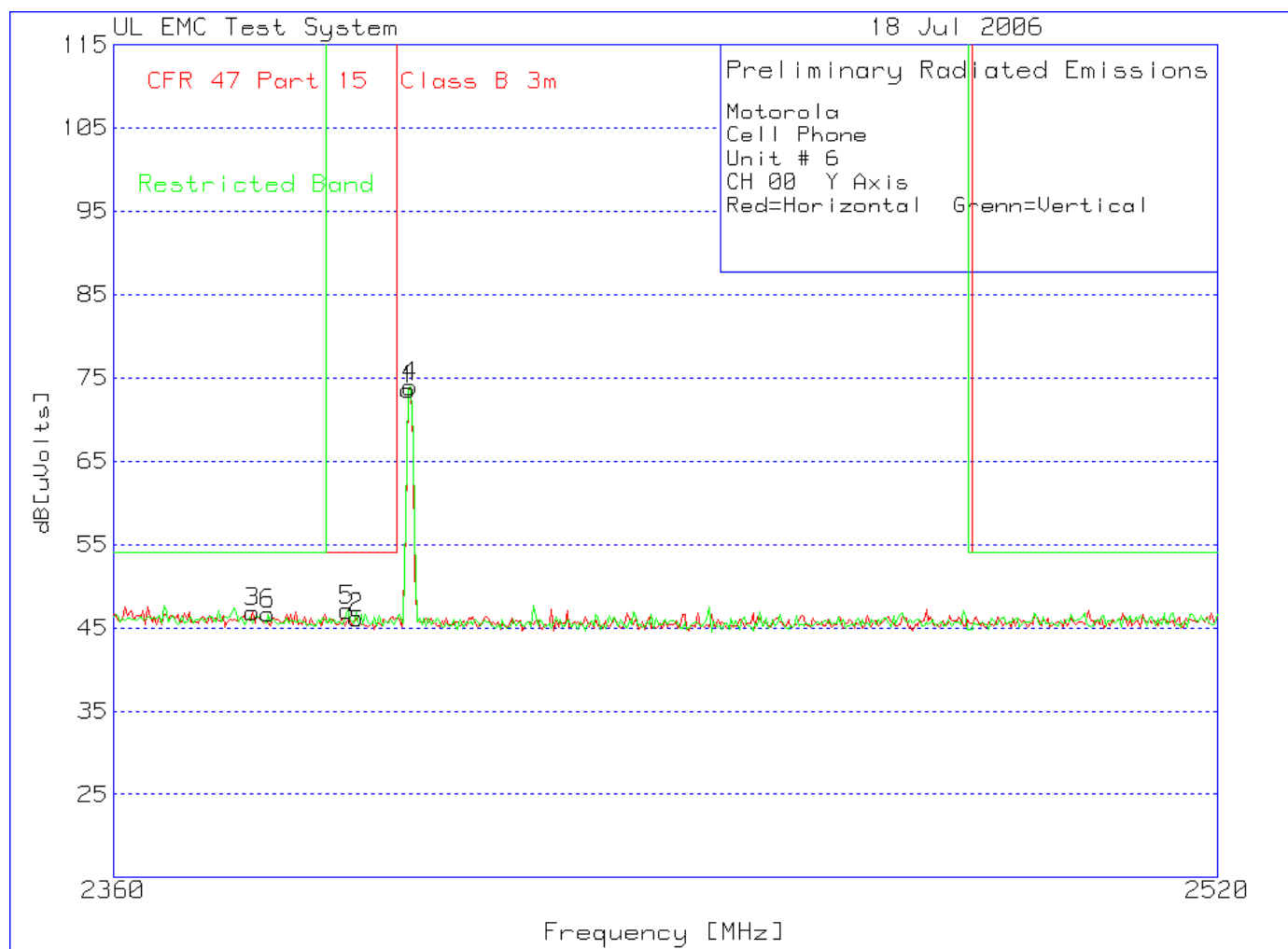
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC. Radiated Emissions

Date Tested: 18 July 2006

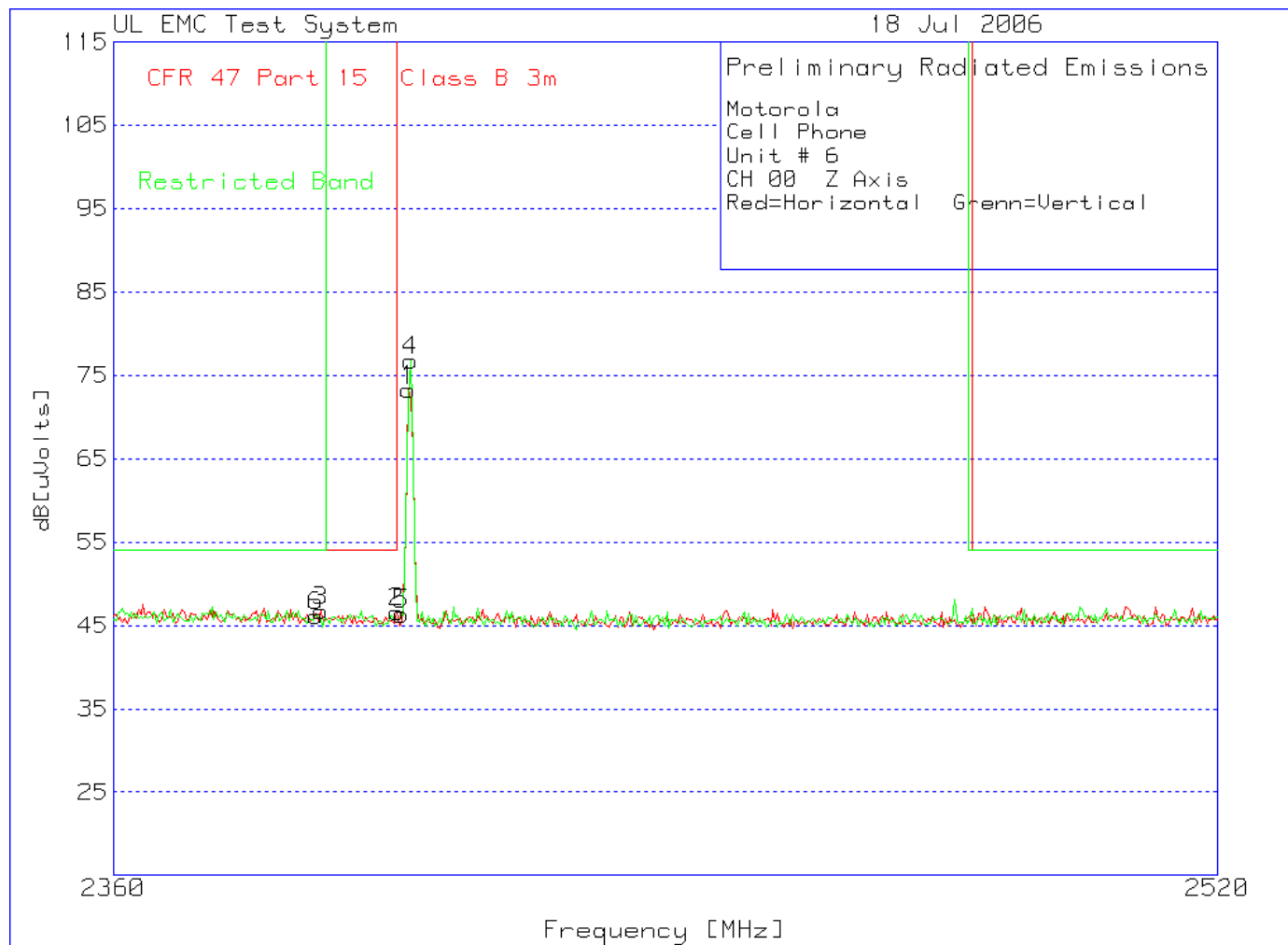
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

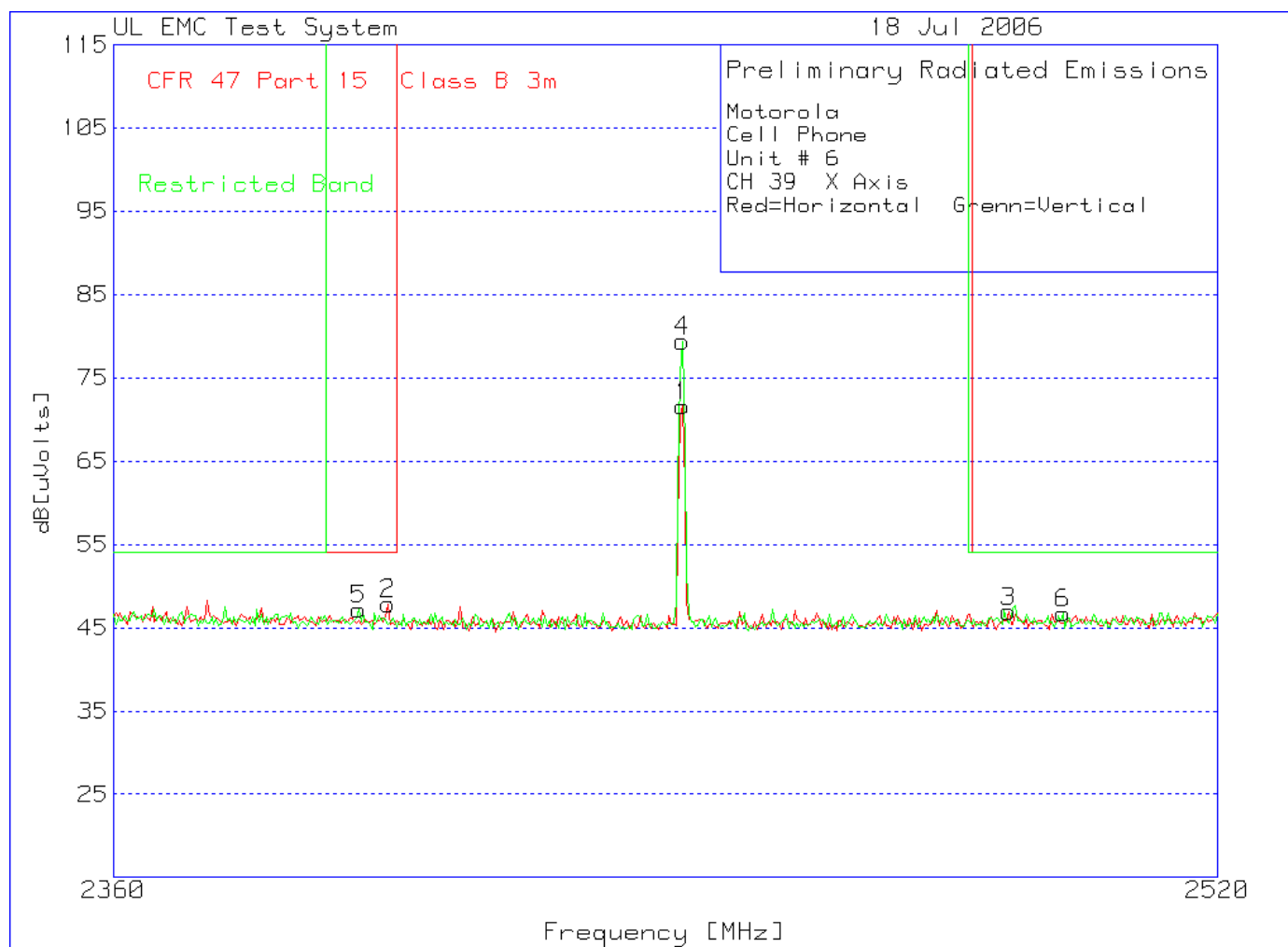
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

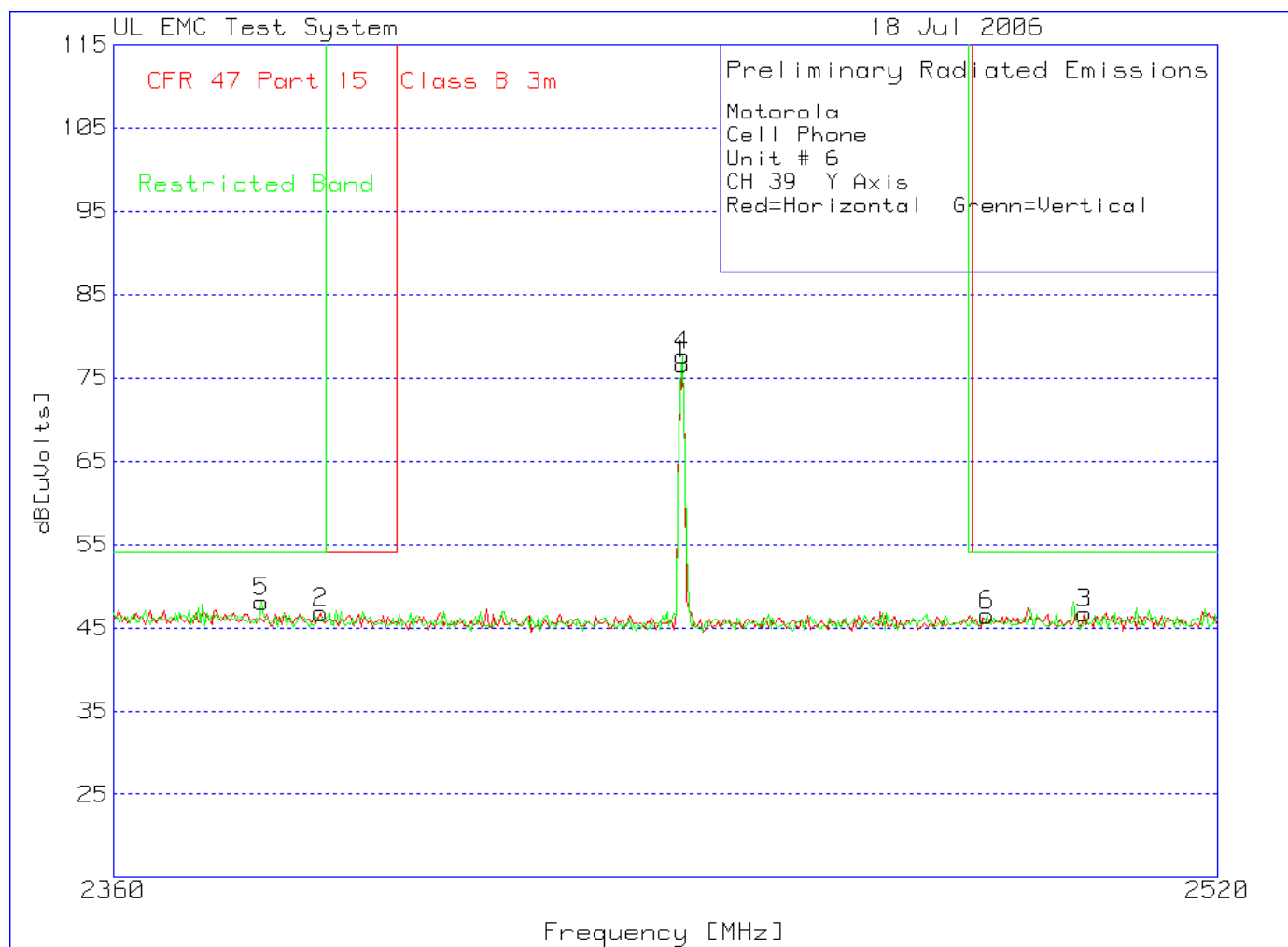
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

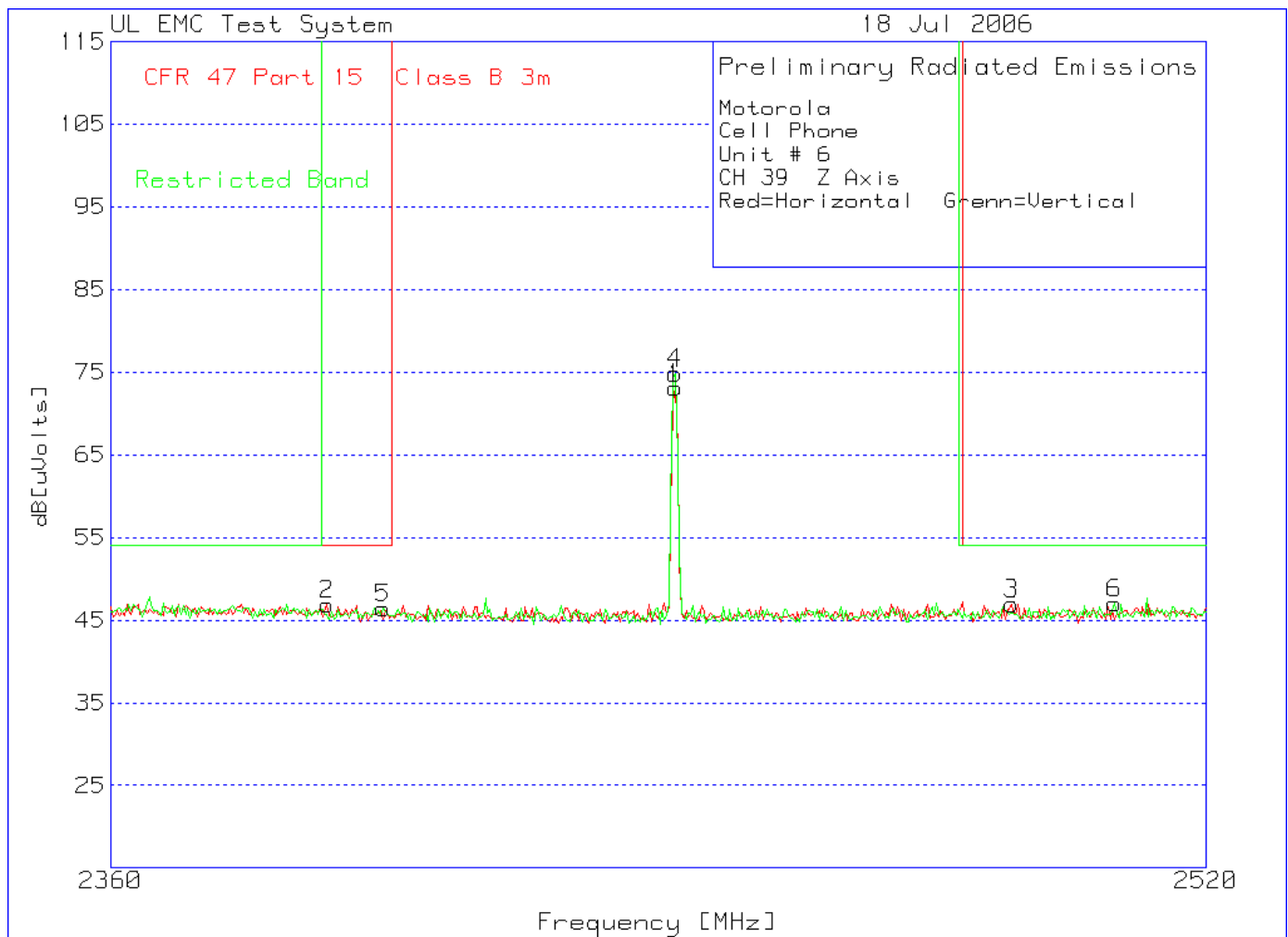
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

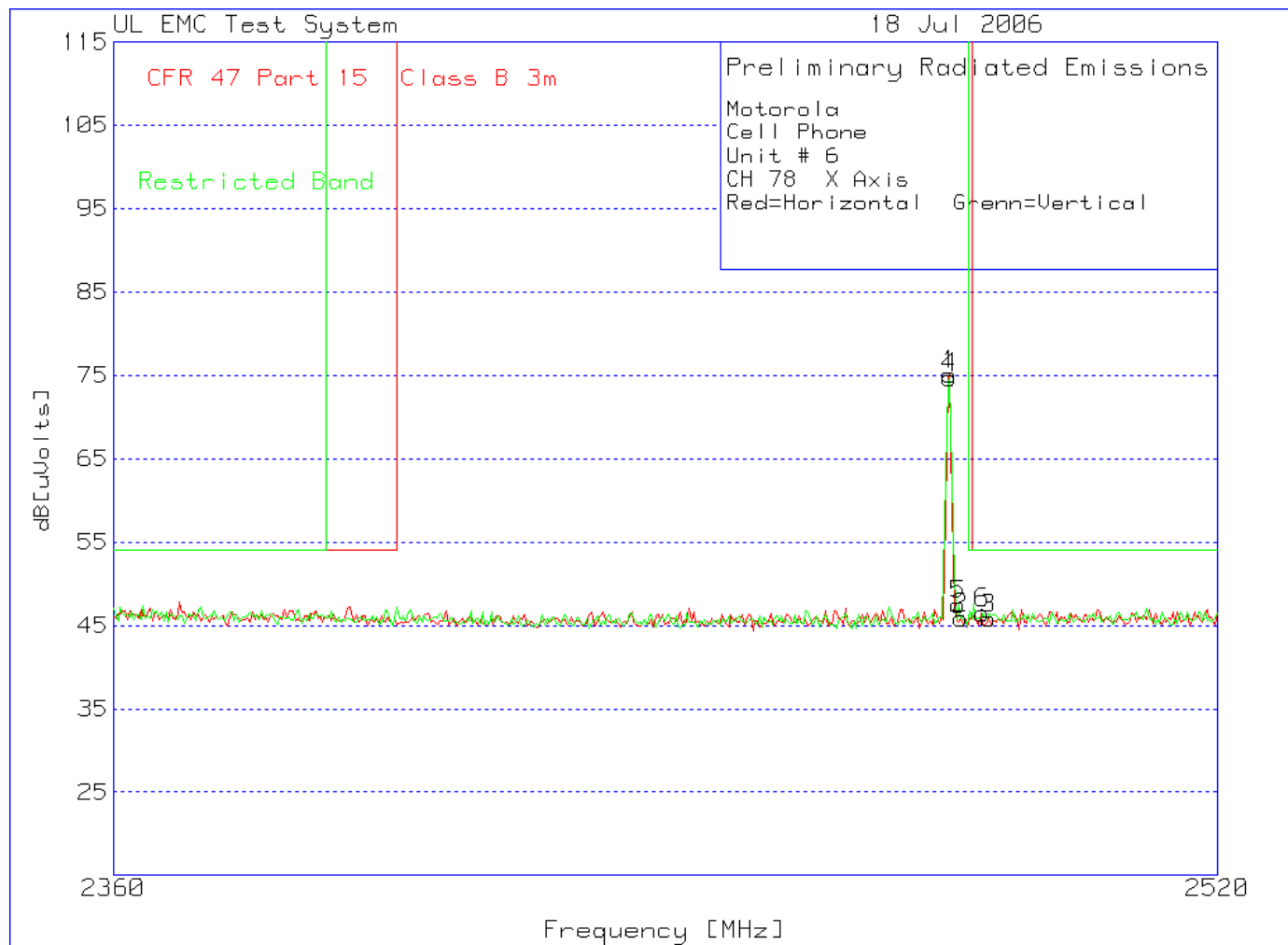
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

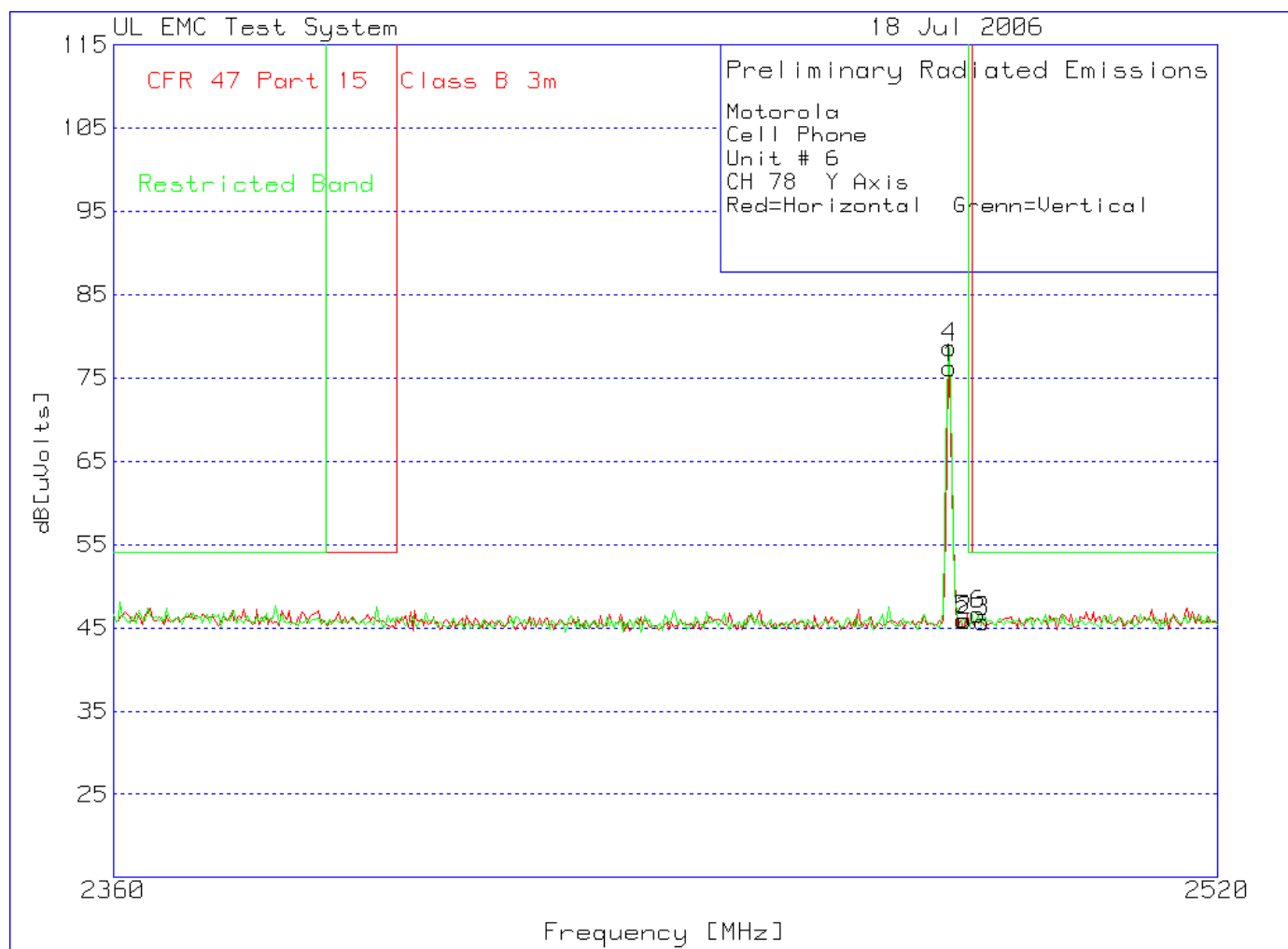
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

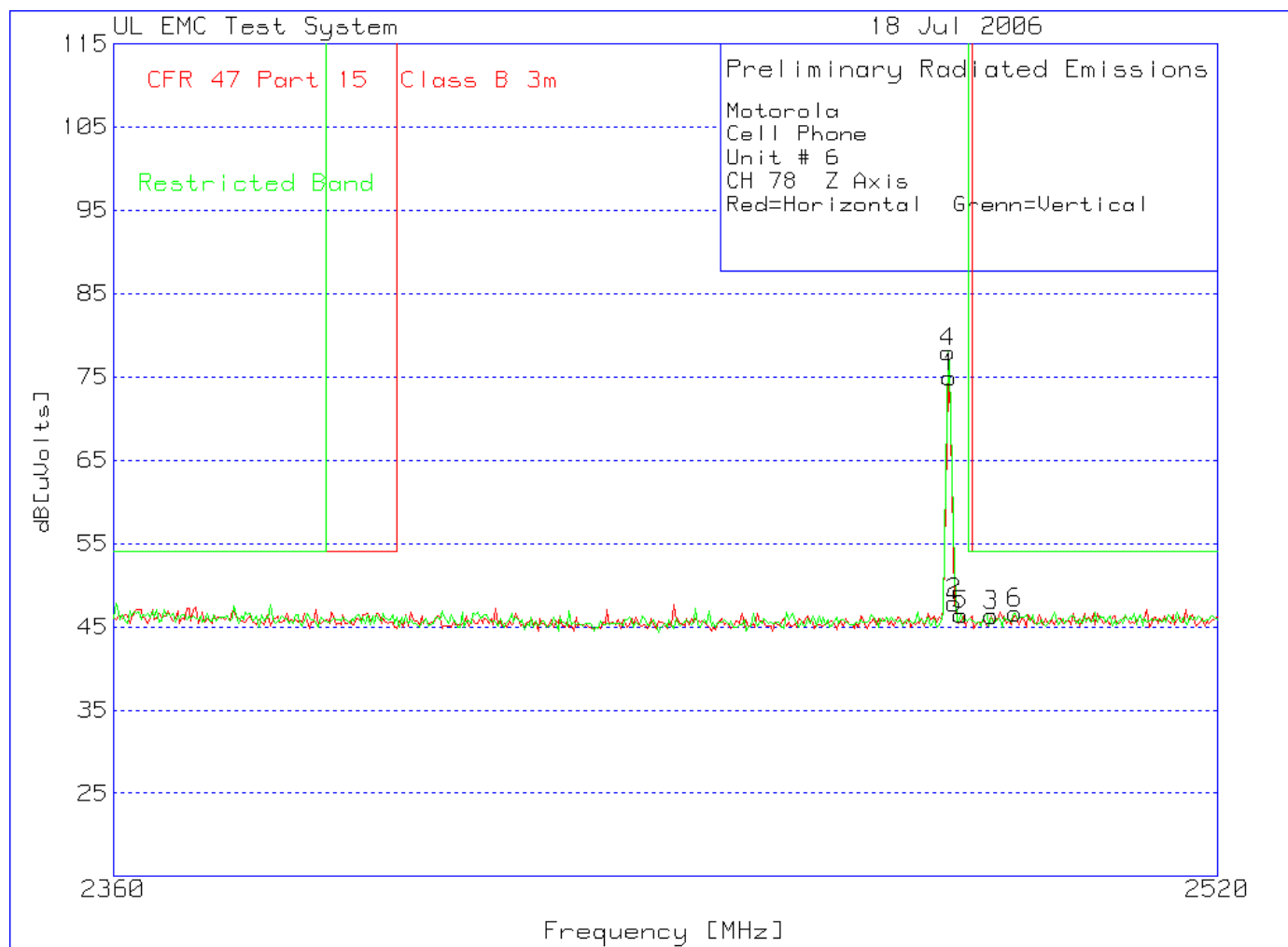
Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 18 July 2006

Manufacturer : Motorola Inc.
Equipment Under Test : IHDT56GX1 Cell Phone (Inband)
Requirement : CFR 47 Part 15 Class B
Detection Mode : Peak (pk)
Bandwidth : 1 MHz
Measurement Distance : 3 meter
Antenna Type : 2-4GHz Horn



APPENDIX C

BT Operating Instructions provided by Motorola in an e-mail communication dated July 14, 2006.
For confidentiality reasons the information is not provided and it is available upon authorized request.