PERSONAL COMMUNICATIONS SECTOR

PRODUCT SAFETY AND COMPLIANCE EMC LABORATORY

EMC TEST REPORT - Addendum

Test Report Number – 13913-2BT

Report Date – May 3, 2004

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature: Michael E. Hill Name: Michael E. Hill

Title: Senior Electrical Engineer Date : 2004-05-06

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A2LA Certificate Number: 1846-01

ACCREDITED

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Test Report Details

Tests Performed By:	Motorola Personal Communications Sector Product Safety and Compliance Group 600 North US Hwy 45 Libertyville, IL 60048 PH (847) 523-6167 Fax (847) 523-4538 Motorola PCS FRN: 0004321311 FCC Registration Number: 316588 Industry Canada Number: IC3908
Radiated Emissions Performed By:	Underwriters Laboratories International EMC Services 333 Pfingsten RD Northbrook, IL 60062 Contact: Lubomir Madjarov (Tel) 847/664-3957 (Fax) 847/313-3957
Tests Requested By:	Motorola Inc. Personal Communications Sector 600 North US Hwy 45 Libertyville, IL 60048
Product Type:	Cellular Phone
Signaling Capability:	GSM 1900, GSM 850 Bluetooth
Model Number:	V3
Serial Numbers:	LRZ0430016, LRZ0470020, LRZ0430053, LRZ0430005, LRZ0430059, LRZ0430029
Testing Complete Date:	May 3, 2004

Applicable Standards

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:

__X__Part 15 Subpart C – Intentional Radiators
_____Part 22 Subpart H - Public Mobile Services
_____Part 24 - Personal Communications Services
_____ Part 90 - Private Land Mobile Radio Service

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4 2001, RSS-118 (AMPS), RSS-128 (TDMA), RSS-129 (CDMA), RSS-133 (PCS)

DA 00-705, “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” published by the Federal Communications Commission was also used in the testing of this product.

Summary of Testing

Test	Test Name	Pass/Fail
1	Carrier Frequency Separation	Pass
2	Number of Hopping Frequencies	Pass
3	Time of Occupancy (Dwell Time)	Pass
4	20 dB Bandwidth	Pass
5	Spurious RF Conducted Emissions	Pass
6	Field Strength of Spurious Emissions	Pass
7	Max Power	N/A
8	Band Edges	See plots
9	Conducted Spurious Emissions	Pass

Test	Test Name	Results
1	Carrier Frequency Separation	1.00MHz
2	Number of Hopping	79
3	Time of Occupancy (Dwell Time)	2.93ms
4	20 dB Bandwidth	586 KHz
5	Spurious RF Conducted Emissions	See plots
6	Field Strength of Spurious Emissions	See plots
7	Max Power	15.58 dBm
8	Band Edges	See plots
9	Conducted Spurious Emissions	See plots

The margin with respect to the limit is the minimum margin for all modes and bands. ( ) indicates the margin at which the product exceeds the limit.

General and Special Conditions

The EUT was tested using a fully charged battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

All testing was done in an indoor controlled environment with an average temperature of 22º C and relative humidity of 50%.

Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

Measuring Equipment and Calibration Information

Manufacturer Name	Item Name Description	Model #	Serial Number	Calibration Due Date
Hewlett Packard	Spectrum Analyzer, EMC	E7405	US39440191	13-Nov-04
Rohde Schwartz	Receiver, EMI Test	ESI26	838786/010	29-Apr-04
Hewlett Packard	PREAMP	8447F	2805A03419	19-May-04
Gigatronics	Power Sensor	80701A	1834037	20-May-04
Gigatronics	Power Meter	8651A	8650561	21-May-04
KWM	Filter - 1900 MHz HP	HPF-L-14768	8427-02	15-Aug-04
KWM	Filter - 800 MHz HP	HPF-L-14767	8427-03	16-Aug-04
Hewlett Packard	PREAMP - 1 - 26.5 GHz	8449B	3008A00535	12-Nov-04
ETS	Antenna - Log Periodic	3148	1189	29-Apr-04
ETS	Antenna - Biconical 20MHz-	3110B	3369	29-Apr-04
ETS	Antenna - Horn 700MHz-20GHz	3115	6222	29-Sep-04
A. H. System	Antenna - Horn 700MHz-18GHz	SAS-200/571	365	17-Dec-04
ETS	Log-Periodic Antenna	3148	1189	04/29/2004
ETS	Biconical Antenna	3110B	3369	04/29/2004
	UL Test Equipment			
Hewlett Packard	QP Adapter	85650A	2811A01069	1/08/2005
Hewlett Packard	S/A Display	8566B	2542A12974	1/08/2005
Hewlett Packard	S/A	8566B	2637A03376	1/08/2005
Hewlett Packard	RF Preselector	85685A	2810A00692	1/08/2005
Rohde & Schwarz	S/A	FSEK20	DE2525315	1/09/2005
EMCO	Horn Antenna 1-18GHz	3115	2638	7/10/2004
EMCO	Horn Antenna 18-26.5GHz	3160-09	9904-1165	N/A*
Chase	Bi-Con Antenna 30-300MHz	VBA6106A	1246	6/23/2004
Chase	Log-Periodic Antenna	UPA6108	1120	6/23/2004

* Per ANSI C63.5-1998 (Revision of ANSI C63.5-1988) pg. 6, under 5.1 General “It is unnecessary to calibrate standard gain horn antennas for use above 1GHz; rather, they are used as gain standards to calibrate other antennas (see 12.3.1 of IEEE Std 149-1979).”

All equipment is on a one-year calibration cycle.

Description of Bluetooth Transmitter

The V3 cell phone offers Bluetooth as a feature. The Bluetooth spread-spectrum, frequency hopping transceiver is designed to operate between 2400 and 2483 MHz. The Bluetooth antenna is mounted on the PCB inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a Bluetooth transmitter, it is designed operate with other Bluetooth devices as defined by industrial standard. In this application, the device is battery-operated. Therefore conducted AC line emissions testing as described in CFR47, Part 15.207 was not necessary.

Measurement Procedures and Data

CARRIER FREQUENCY SEPARATION

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

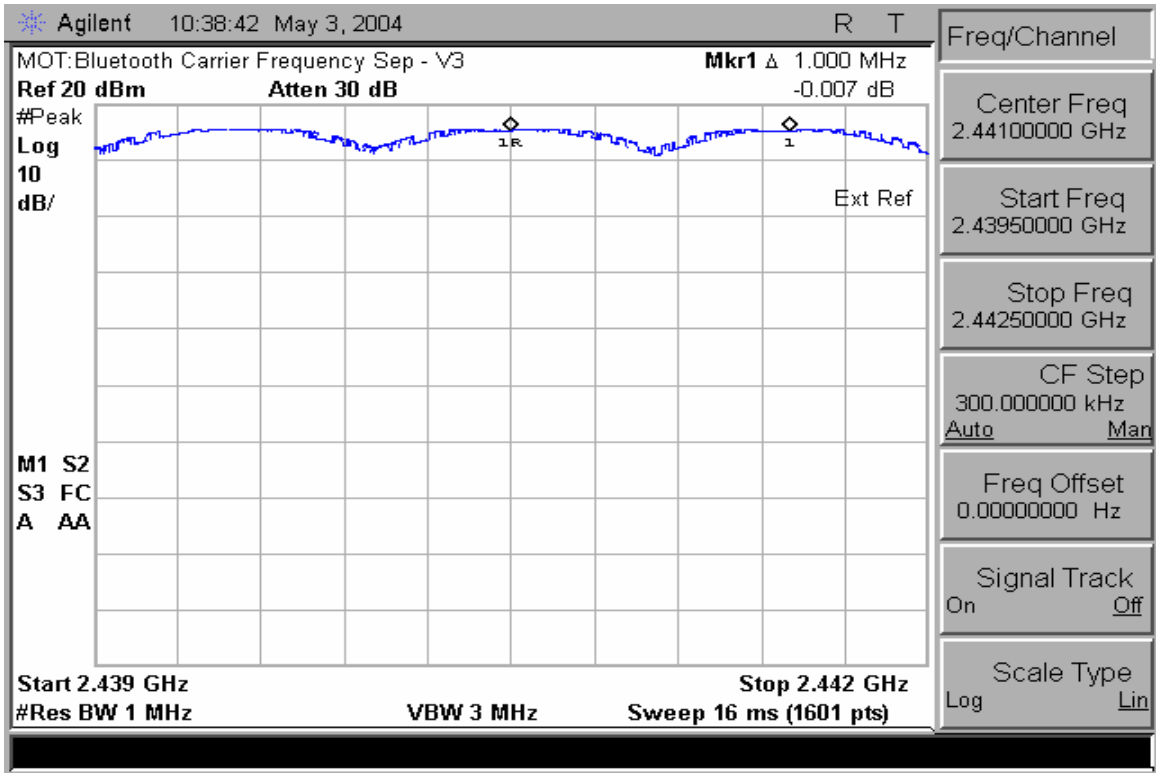
The Bluetooth transmitter of the V3 had its hopping function enabled. The following spectrum analyzer settings were used:

1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
3. Video (or Average) Bandwidth (VBW) ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

Measurement Results

See attached.



Carrier Frequency Separation

NUMBER OF HOPPING FREQUENCIES

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

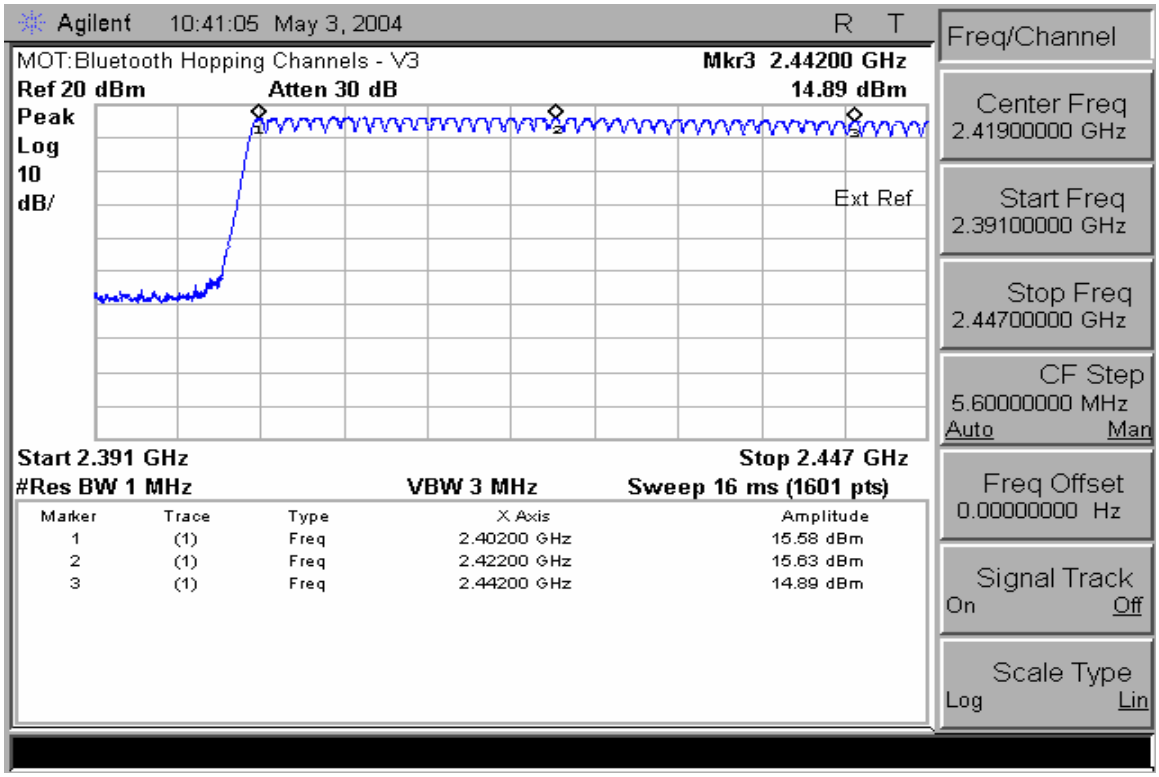
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = the frequency band of operation
2. RBW ≥ 1% of the span
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

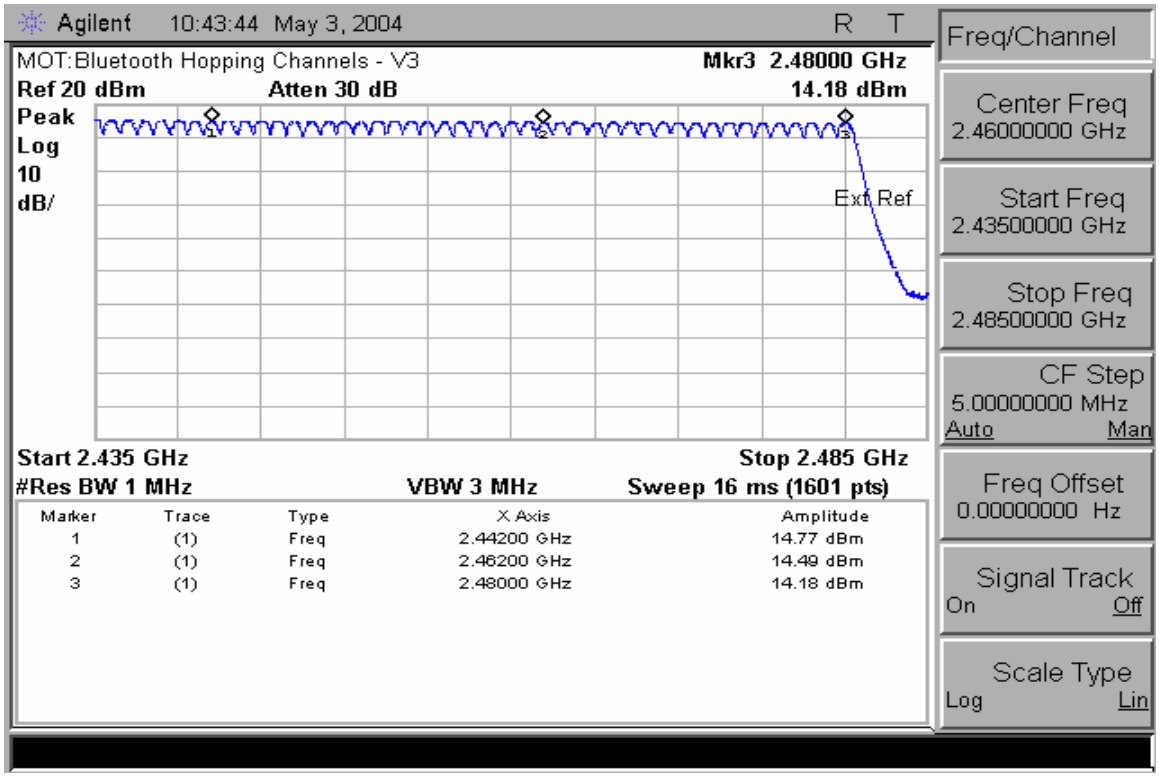
The trace was allowed to stabilize.

Measurement Results

See attached.



Number of Hopping Frequencies (Channels 0 – 40)



Number of Hopping Frequencies (Channels 40 – 78)

TIME OF OCCUPANCY (DWELL TIME)

CFR47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

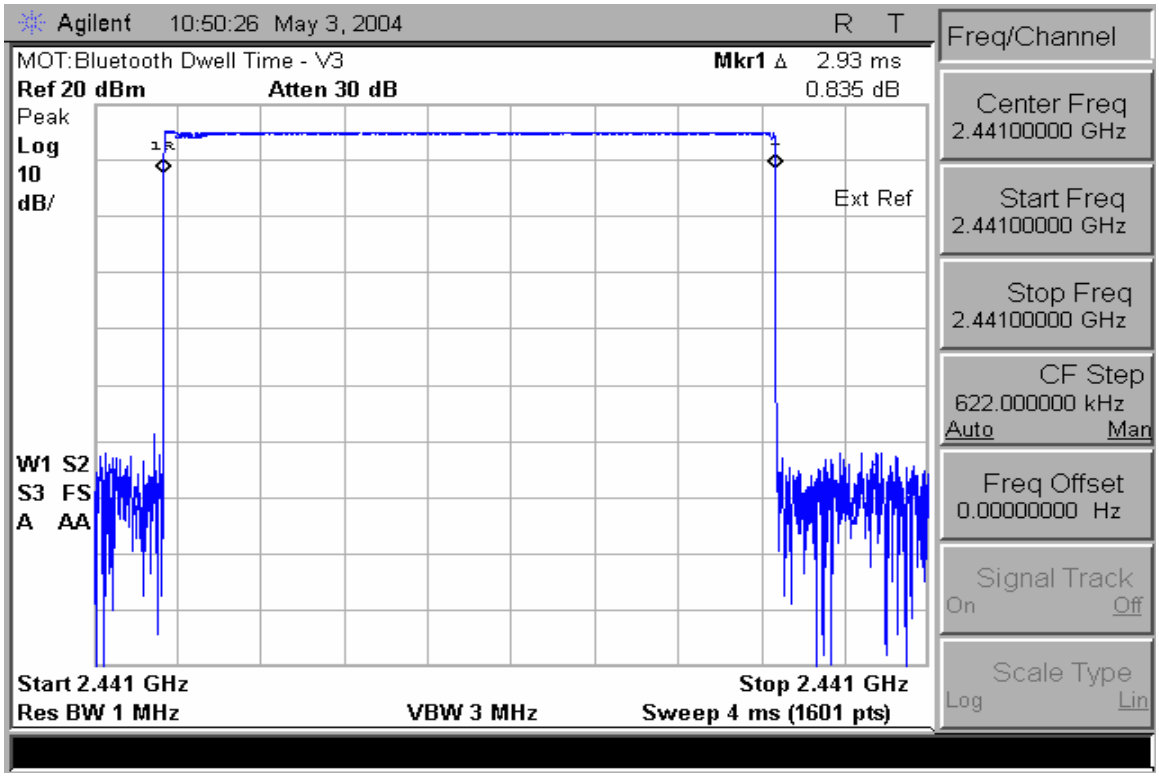
The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW ≥ RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

The marker-delta function was used to determine the dwell time.

Measurement Results

Attached



Dwell Time

As defined in DA 0075, dwell time is used to calculate a Duty Cycle Correction Factor for radiated emissions:

DCCF = 20 log [(dwell time)/100ms] = 20 log [2.93ms/100ms] = -30.66

20dB Bandwidth

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

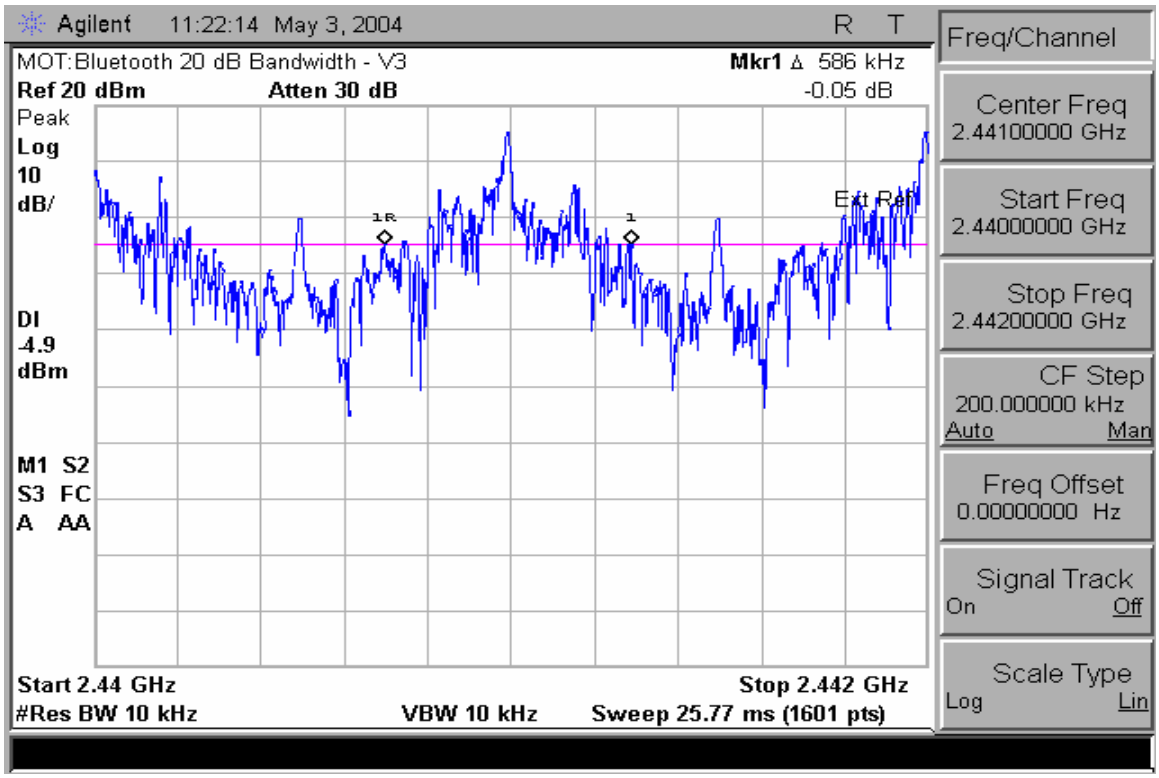
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW ≥ 1% of the 20dB bandwidth
3. VBW ≥ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

Measurement Results

Attached



20 dB Bandwidth

FIELD STRENGTH OF SPURIOUS EMISSIONS

CFR47 Part 2.1053, 15.249

Measurement Procedure

The Equipment-Under-Test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The Equipment-Under-Test is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole.

The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain, and antenna correction factors.

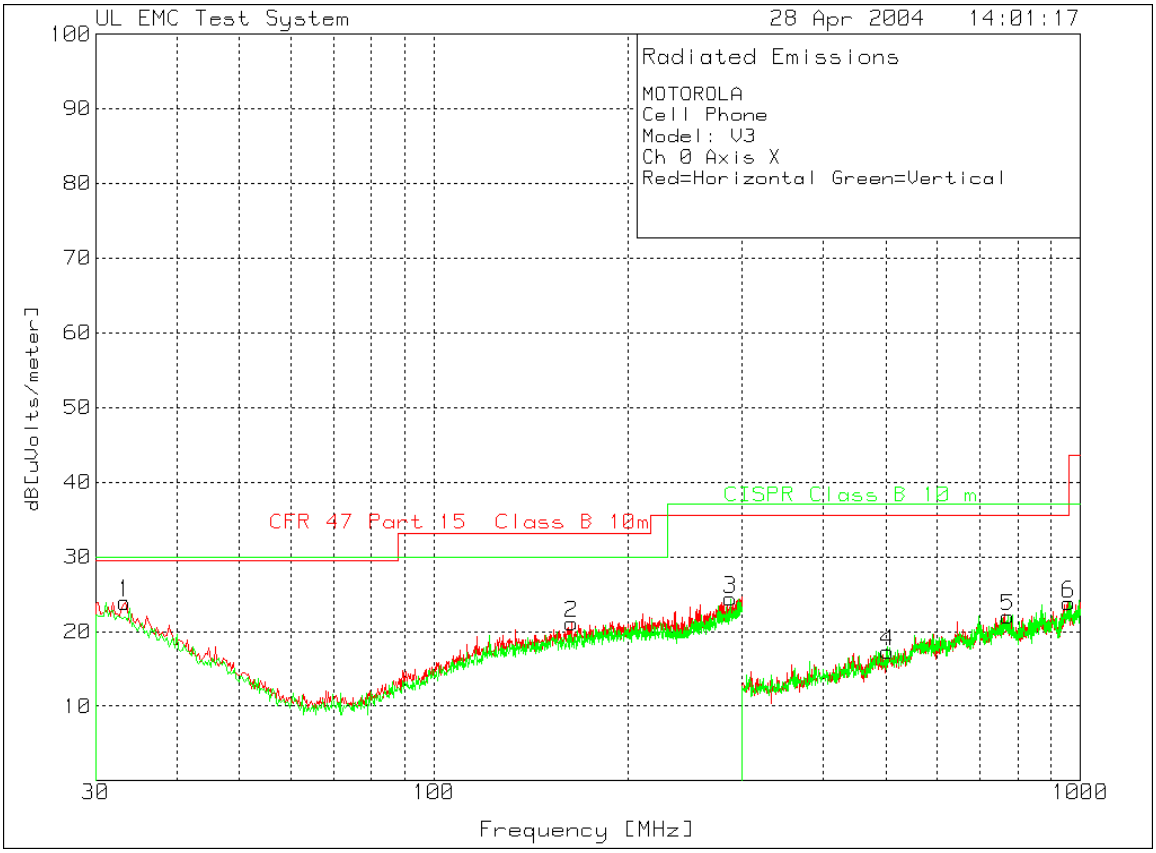
Field Strength (dBuV/m) = EMI Receiver Level (dBuV) + Cable Loss (dB) - Amplifier Gain (dB) + Antenna Correction Factor (1/m)

A fully charged battery was used for the supply voltage.

This data was taken at Underwriter's Laboratories.

Measurement Results

Attached

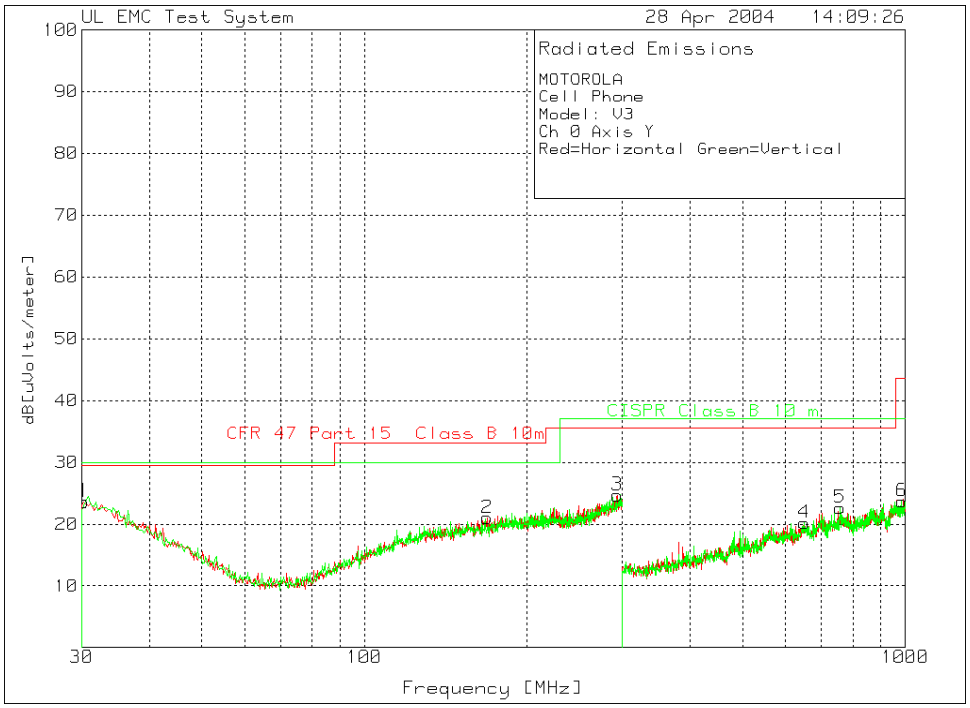


30 -1000MHz Low Channel Dual Polarization X-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 0 Axis X
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	33.24	32.3 pk	-26.9	18.5	23.9	29.6	30
Azimuth:1	Height:101 Horz	**Margin [dB]**			**-5.7**	**-6.1**	
2	163.11	32.6 pk	-26.5	15	21.1	33.1	30
Azimuth:357	Height:101 Horz	**Margin [dB]**			**-12**	**-8.9**	
Range: 2 30 - 300MHz							
3	287.31	32.1 pk	-25.7	18	24.4	35.6	37
Azimuth:324	Height:101 Vert	**Margin [dB]**			**-11.2**	**-12.6**	
Range: 3 300 - 1000MHz							
4	503	31.3 pk	-31.9	17.9	17.3	35.6	37
Azimuth:280	Height:101 Horz	**Margin [dB]**			**-18.3**	**-19.7**	
Range: 4 300 - 1000MHz							
5	771.8	31.3 pk	-31.4	22.1	22	35.6	37
Azimuth:9	Height:101 Vert	**Margin [dB]**			**-13.6**	**-15**	
6	958.7	30.8 pk	-31.4	24.4	23.8	35.6	37
Azimuth:148	Height:101 Vert	**Margin [dB]**			**-11.8**	**-13.2**	

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

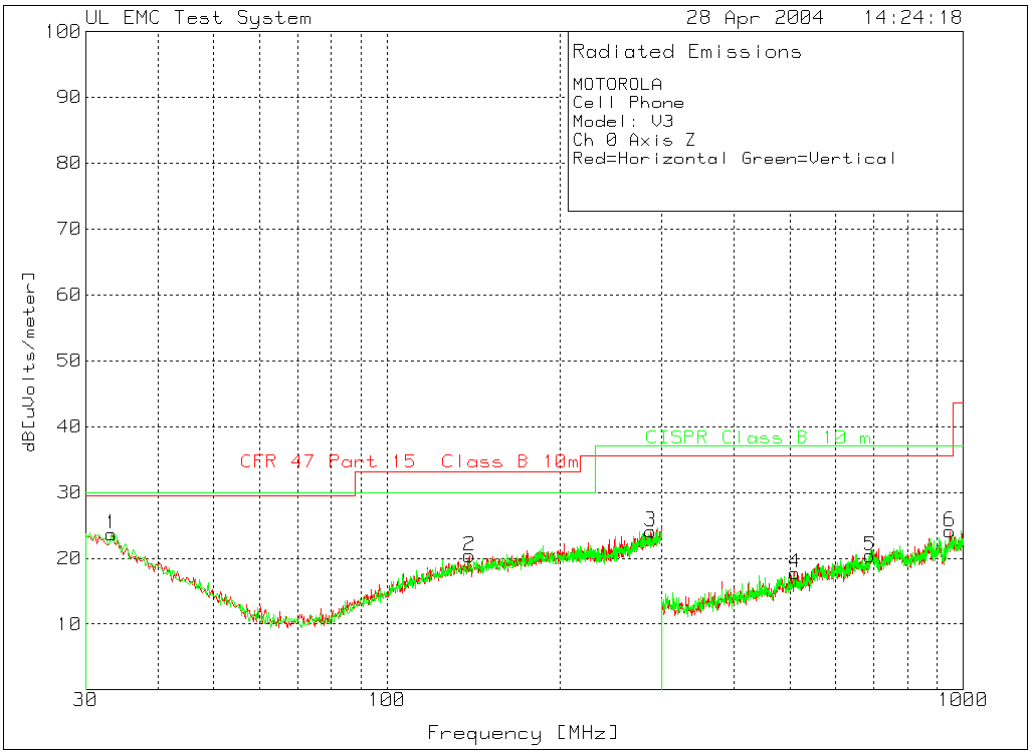


30 -1000MHz Low Channel Dual Polarization Y-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 0 Axis Y
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	30.27	31.3 pk	-26.9	19.2	23.6	29.6	30
Azimuth:269	Height:101 Horz				**Margin [dB]**	**-6**	**-6.4**
2	168.51	32.2 pk	-26.5	15.3	21	33.1	30
Azimuth:67	Height:101 Horz				**Margin [dB]**	**-12.1**	-9
3	293.25	32.2 pk	-25.6	18.1	24.7	35.6	37
Azimuth:235	Height:101 Horz				**Margin [dB]**	**-10.9**	**-12.3**
Range: 4 300 - 1000MHz							
4	650.7	31 pk	-31.3	20.5	20.2	35.6	37
Azimuth:195	Height:101 Vert				**Margin [dB]**	**-15.4**	**-16.8**
5	756.4	32.2 pk	-31.2	21.6	22.6	35.6	37
Azimuth:33	Height:101 Vert				**Margin [dB]**	**-13**	**-14.4**
6	985.3	30.7 pk	-31	24	23.7	43.5	37
Azimuth:195	Height:101 Vert				**Margin [dB]**	**-19.8**	**-13.3**

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

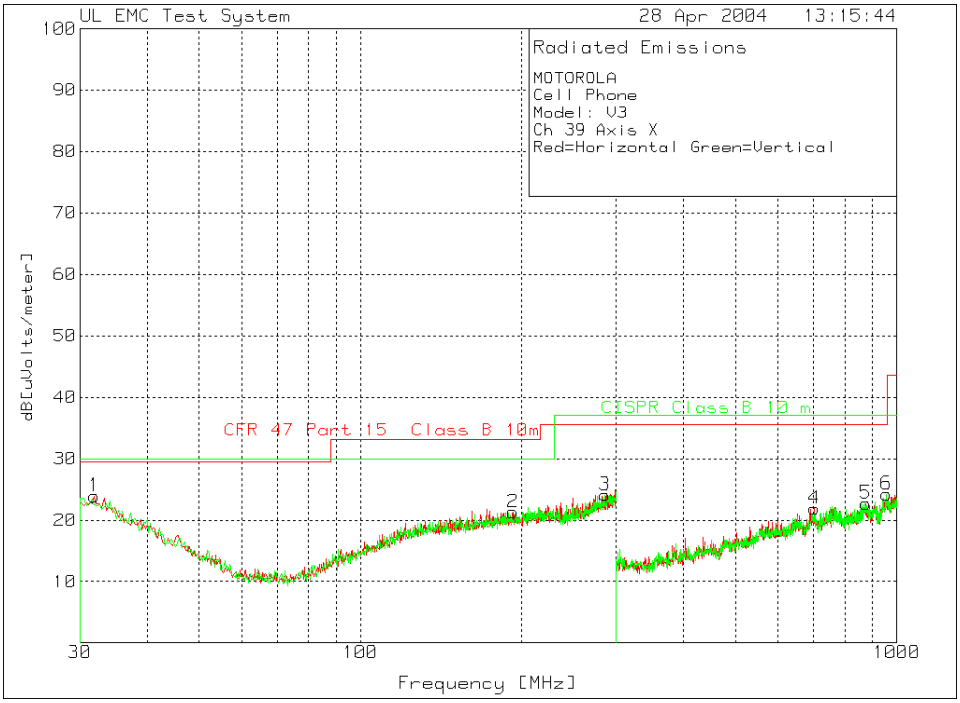


30 -1000MHz Low Channel Dual Polarization Z-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 0 Axis Z
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	33.24	32.1 pk	-26.9	18.5	23.7	29.6	30
	Azimuth:357	Height:101 Horz			**Margin [dB]**	**-5.9**	**-6.3**
2	139.08	32.6 pk	-26.6	14.4	20.4	33.1	30
	Azimuth:357	Height:101 Horz			**Margin [dB]**	**-12.7**	**-9.6**
3	286.77	31.8 pk	-25.7	18	24.1	35.6	37
	Azimuth:337	Height:101 Horz			**Margin [dB]**	**-11.5**	**-12.9**
Range: 3 300 - 1000MHz							
4	510	31.8 pk	-31.9	17.9	17.8	35.6	37
	Azimuth:95	Height:101 Horz			**Margin [dB]**	**-17.8**	**-19.2**
5	689.2	30.5 pk	-31.2	21.1	20.4	35.6	37
	Azimuth:350	Height:101 Horz			**Margin [dB]**	**-15.2**	**-16.6**
6	946.8	31.4 pk	-31.7	24.4	24.1	35.6	37
	Azimuth:211	Height:101 Horz			**Margin [dB]**	**-11.5**	**-12.9**

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

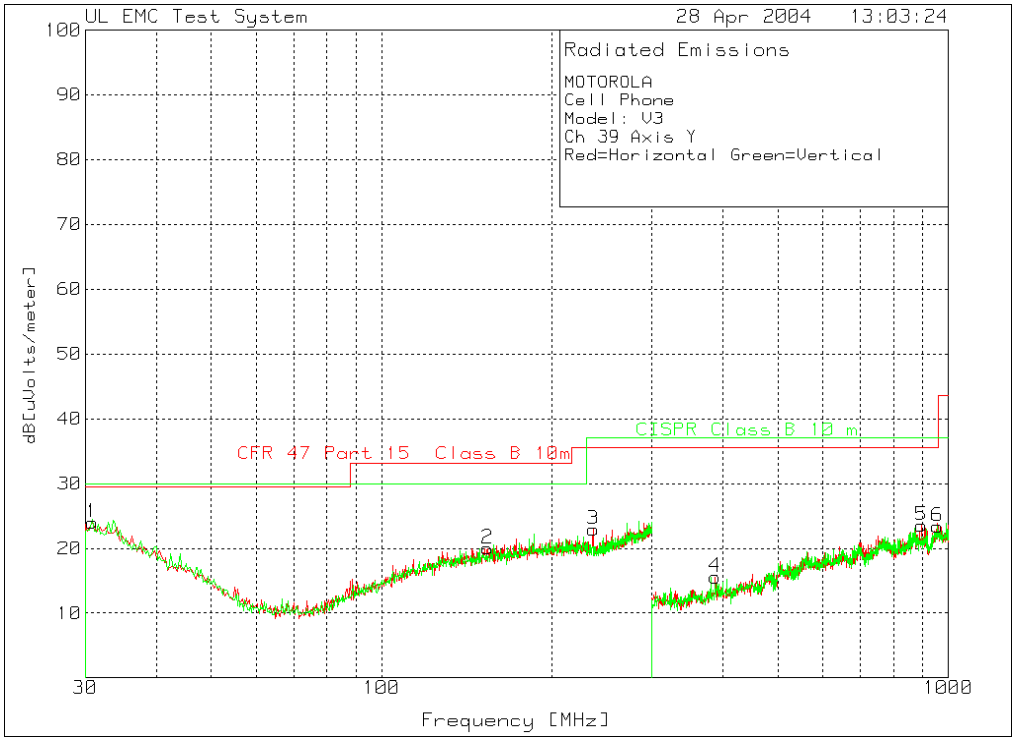


30 -1000MHz Mid Channel Dual Polarization X-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 39 Axis X
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	31.89	31.9 pk	-26.9	18.9	23.9	29.6	30
	Azimuth:324	Height:101 Horz			**Margin [dB]**	**-5.7**	**-6.1**
2	192.27	31.7 pk	-26.3	15.9	21.3	33.1	30
	Azimuth:324	Height:101 Horz			**Margin [dB]**	**-11.8**	**-8.7**
Range: 2 30 - 300MHz							
3	285.69	31.9 pk	-25.7	17.9	24.1	35.6	37
	Azimuth:204	Height:101 Vert			**Margin [dB]**	**-11.5**	**-12.9**
Range: 3 300 - 1000MHz							
4	702.5	31.7 pk	-31.1	21.3	21.9	35.6	37
	Azimuth:172	Height:101 Horz			**Margin [dB]**	**-13.7**	**-15.1**
5	875.4	30.9 pk	-31.9	23.7	22.7	35.6	37
	Azimuth:195	Height:101 Horz			**Margin [dB]**	**-12.9**	**-14.3**
Range: 4 300 - 1000MHz							
6	956.6	31.2 pk	-31.5	24.5	24.2	35.6	37
	Azimuth:116	Height:101 Vert			**Margin [dB]**	**-11.4**	**-12.8**

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

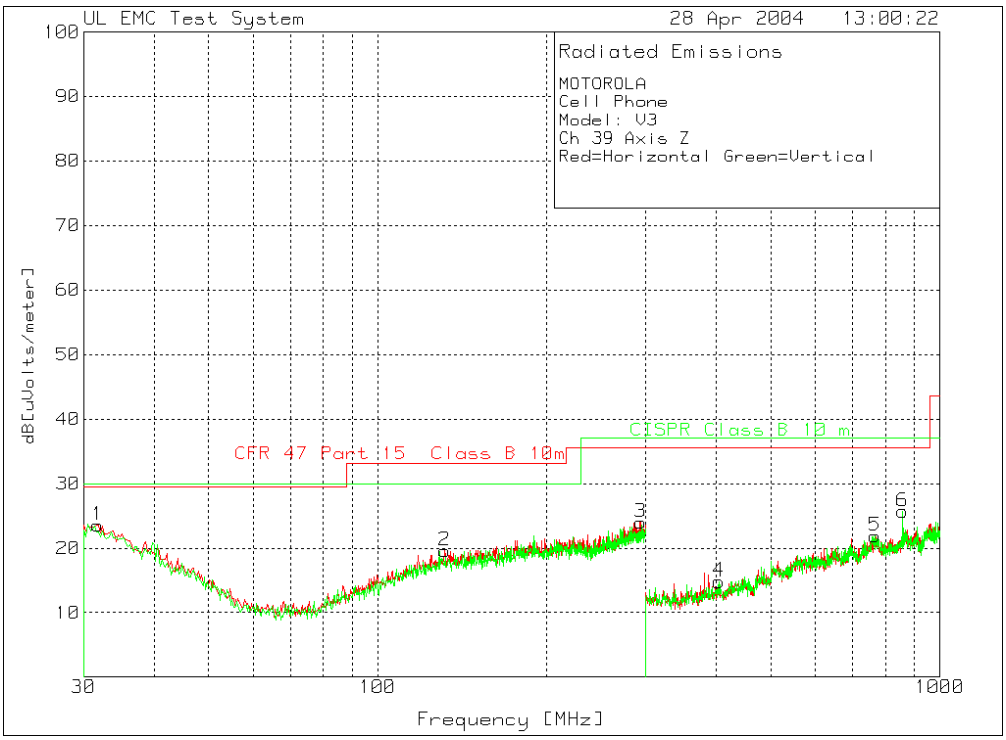


30 -1000MHz Mid-Channel Dual Polarization Y-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 39 Axis Y
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	30.81	31.8 pk	-26.9	19.1	24	29.6	30
Azimuth:9		Height:101 Horz			**Margin [dB]**	**-5.6**	**-6**
2	153.66	31.6 pk	-26.6	15	20	33.1	30
Azimuth:137		Height:101 Horz			**Margin [dB]**	**-13.1**	**-10**
3	236.01	33.3 pk	-26	15.6	22.9	35.6	37
Azimuth:306		Height:101 Horz			**Margin [dB]**	**-12.7**	**-14.1**
Range: 3 300 - 1000MHz							
4	387.5	32.2 pk	-32.3	15.7	15.6	35.6	37
Azimuth:165		Height:101 Horz			**Margin [dB]**	**-20**	**-21.4**
5	896.4	32.1 pk	-31.8	23.2	23.5	35.6	37
Azimuth:118		Height:101 Horz			**Margin [dB]**	**-12.1**	**-13.5**
Range: 4 300 - 1000MHz							
6	956.6	30.4 pk	-31.5	24.5	23.4	35.6	37
Azimuth:148		Height:101 Vert			Margin [dB]	-12.2	-13.6

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

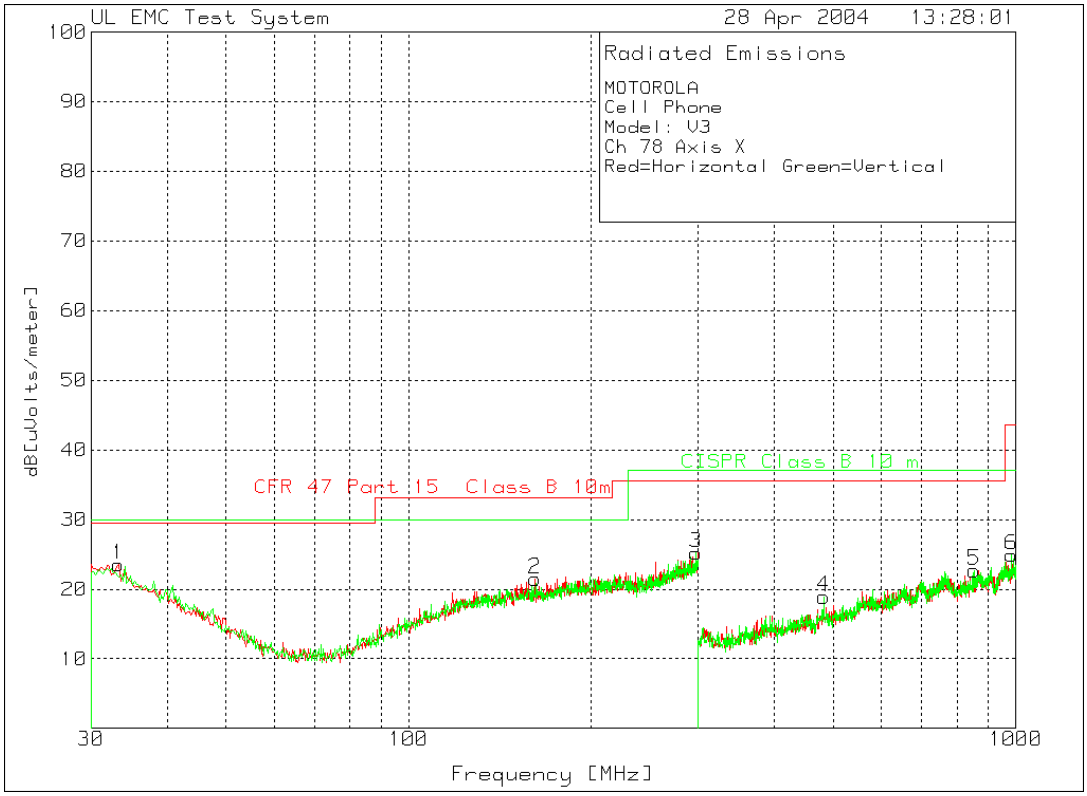


30 -1000MHz Mid Channel Dual Polarization Z-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 39 Axis Z
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	31.755	31.6 pk	-26.9	18.8	23.5	29.6	30
	Azimuth:291	Height:101 Horz			**Margin [dB]**	**-6.1**	**-6.5**
2	131.52	32 pk	-26.6	14.2	19.6	33.1	30
	Azimuth:10	Height:101 Horz			**Margin [dB]**	**-13.5**	**-10.4**
3	293.25	31.5 pk	-25.6	18.1	24	35.6	37
	Azimuth:324	Height:101 Horz			**Margin [dB]**	**-11.6**	**-13**
Range: 4 300 - 1000MHz							
4	404.3	31.3 pk	-32.5	16	14.8	35.6	37
	Azimuth:58	Height:101 Vert			**Margin [dB]**	**-20.8**	**-22.2**
5	766.2	31.4 pk	-31.5	22	21.9	35.6	37
	Azimuth:287	Height:101 Vert			**Margin [dB]**	**-13.7**	**-15.1**
6	859.3	34.6 pk	-31.9	23	25.7	35.6	37
	Azimuth:35	Height:101 Vert			**Margin [dB]**	**-9.9**	**-11.3**

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

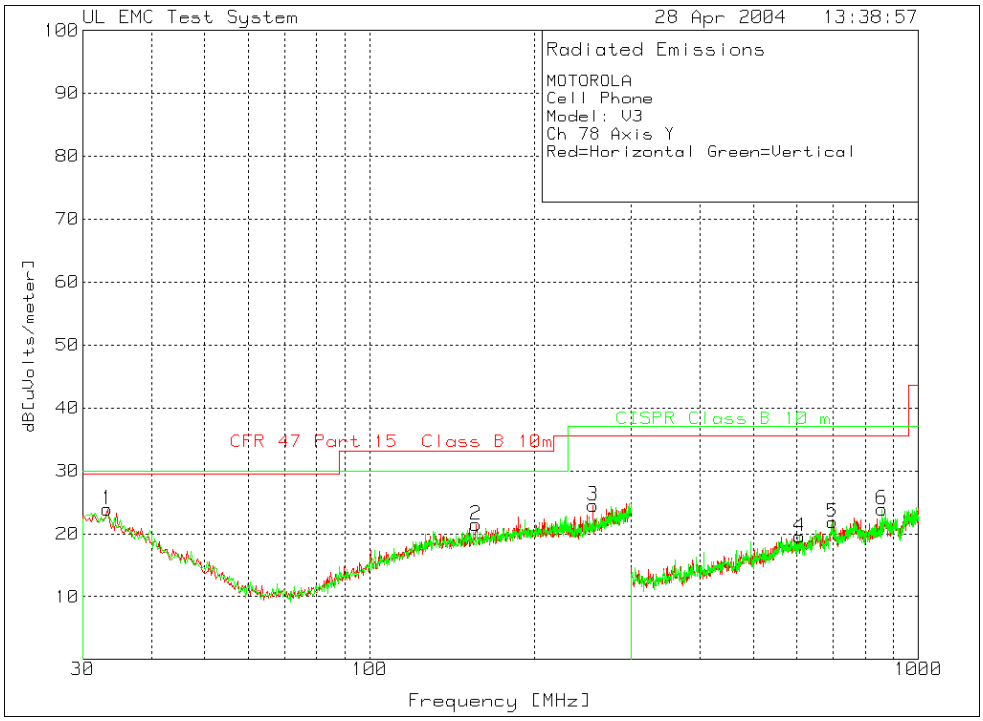


30 -1000MHz High Channel Dual Polarization X-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 78 Axis X
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	33.24	31.9 pk	-26.9	18.5	23.5	29.6	30
Azimuth:271 Height:101 Horz					**Margin [dB]**	**-6.1**	**-6.5**
2	161.49	33 pk	-26.5	15	21.5	33.1	30
Azimuth:103 Height:101 Horz					**Margin [dB]**	**-11.6**	**-8.5**
Range: 2 30 - 300MHz							
3	297.57	32.4 pk	-25.7	18.5	25.2	35.6	37
Azimuth:88 Height:101 Vert					**Margin [dB]**	**-10.4**	**-11.8**
Range: 4 300 - 1000MHz							
4	482.7	32.8 pk	-32	18.1	18.9	5.6	37
Azimuth:10 Height:101 Vert					**Margin [dB]**	**-16.7**	**-18.1**
5	853.7	31.8 pk	-31.9	22.8	22.7	35.6	37
Azimuth:287 Height:101 Vert					**Margin [dB]**	**-12.9**	**-14.3**
6	983.9	31.9 pk	-30.9	23.9	24.9	43.5	37
Azimuth:310 Height:101 Vert					**Margin [dB]**	**-18.6**	**-12.1**

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

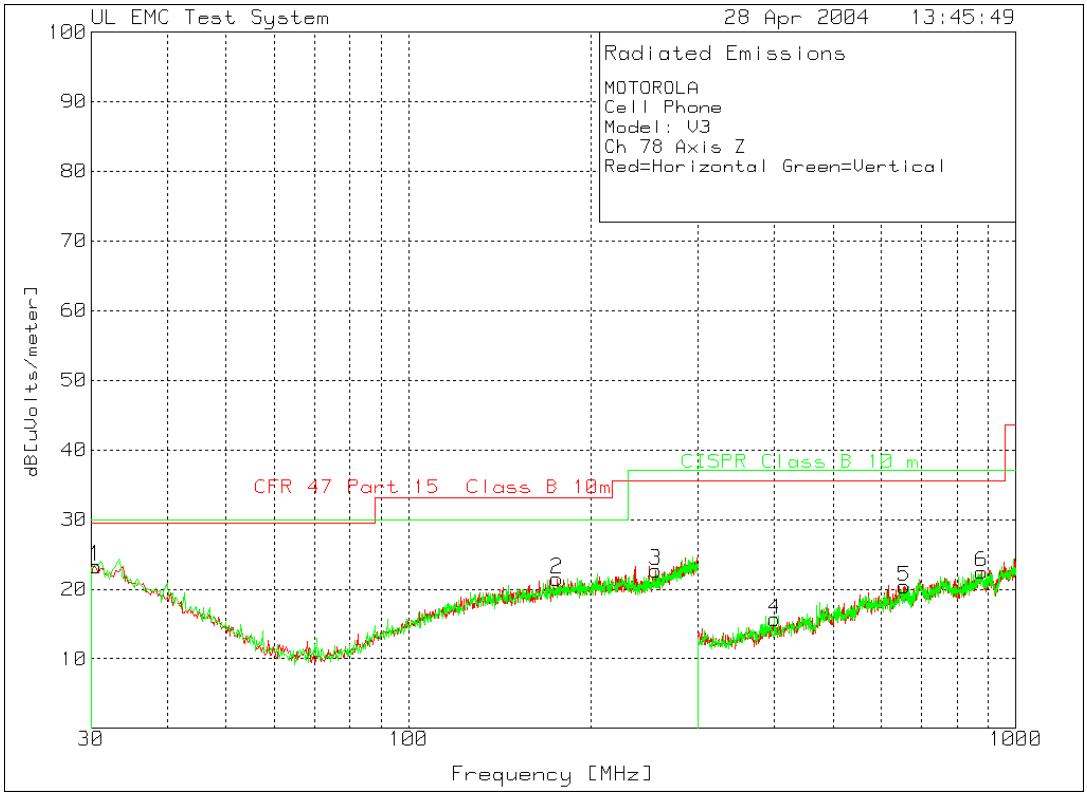


30 -1000MHz High Channel Dual Polarization Y-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 78 Axis Y
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]		Limit:1	2
Range: 1 30 - 300MHz								
1	33.24	32.3 pk	-26.9	18.5	23.9		29.6	30
	Azimuth:168	Height:101 Horz		**Margin [dB]**	**-5.7**	**-6.1**		
2	156.09	32.9 pk	-26.5	15.1	21.5		33.1	30
	Azimuth:100	Height:101 Horz		**Margin [dB]**	**-11.6**	**-8.5**		
3	255.18	33.9 pk	-25.9	16.5	24.5		35.6	37
	Azimuth:100	Height:101 Horz		**Margin [dB]**	**-11.1**	**-12.5**		
Range: 4 300 - 1000MHz								
4	608	31.5 pk	-31.4	19.5	19.6		35.6	37
	Azimuth:264	Height:101 Vert		**Margin [dB]**	**-16**	**-17.4**		
5	697.6	31.3 pk	-31.2	21.8	21.9		35.6	37
	Azimuth:287	Height:101 Vert		**Margin [dB]**	**-13.7**	**-15.1**		
6	859.3	32.8 pk	-31.9	23	23.9		35.6	37
	Azimuth:33	Height:101 Vert		**Margin [dB]**	**-11.7**	**-13.1**		

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

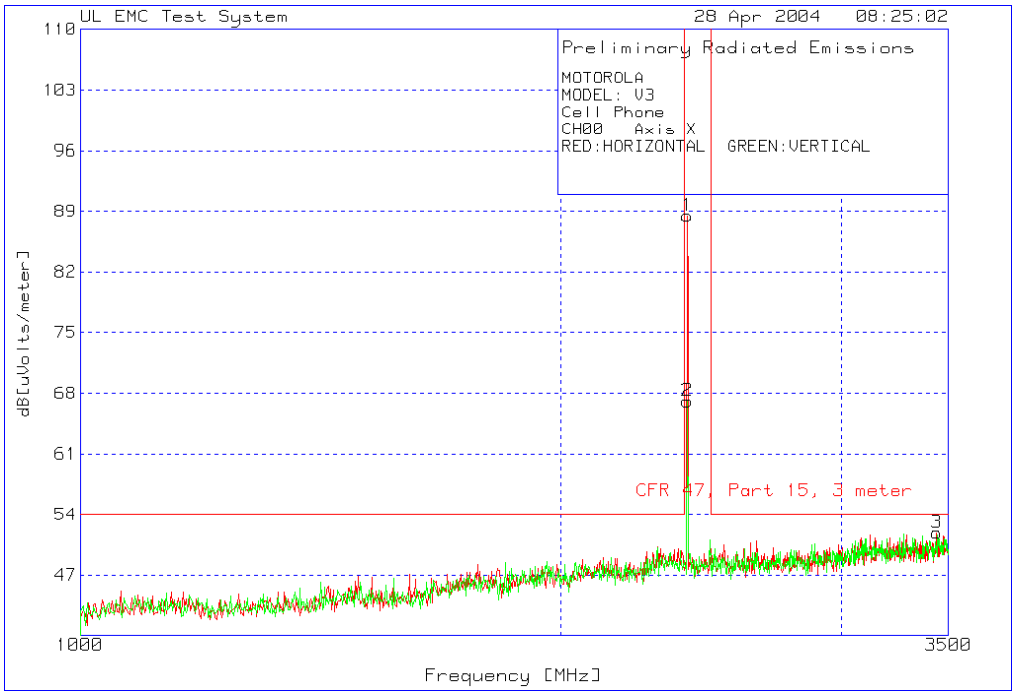


30 -1000MHz High Channel Dual Polarization Z-Orientation

MOTOROLA
Cell Phone
Model: V3
Ch 78 Axis Z
Red=Horizontal Green=Vertical

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	30.54	31 pk	-26.9	19.2	23.3	29.6	30
	Azimuth:168	Height:101 Horz		**Margin [dB]**	**-6.3**	**-6.7**	
2	175.53	32.4 pk	-26.4	15.5	21.5	33.1	30
	Azimuth:357	Height:101 Horz		**Margin [dB]**	**-11.6**	**-8.5**	
3	255.18	32.1 pk	-25.9	16.5	22.7	35.6	37
	Azimuth:134	Height:101 Horz		**Margin [dB]**	**-12.9**	**-14.3**	
Range: 3 300 - 1000MHz							
4	400.8	32 pk	-32.3	16	15.7	35.6	37
	Azimuth:328	Height:101 Horz		**Margin [dB]**	**-19.9**	**-21.3**	
5	654.9	31.1 pk	-31.2	20.5	20.4	35.6	37
	Azimuth:3	Height:101 Horz		**Margin [dB]**	**-15.2**	**-16.6**	
6	878.2	31 pk	-32	23.5	22.5	35.6	37
	Azimuth:9	Height:101 Horz		**Margin [dB]**	**-13.1**	**-14.5**	

LIMIT 1: CFR 47 Part 15 Class B 10m
LIMIT 2: CISPR Class B 10 m
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

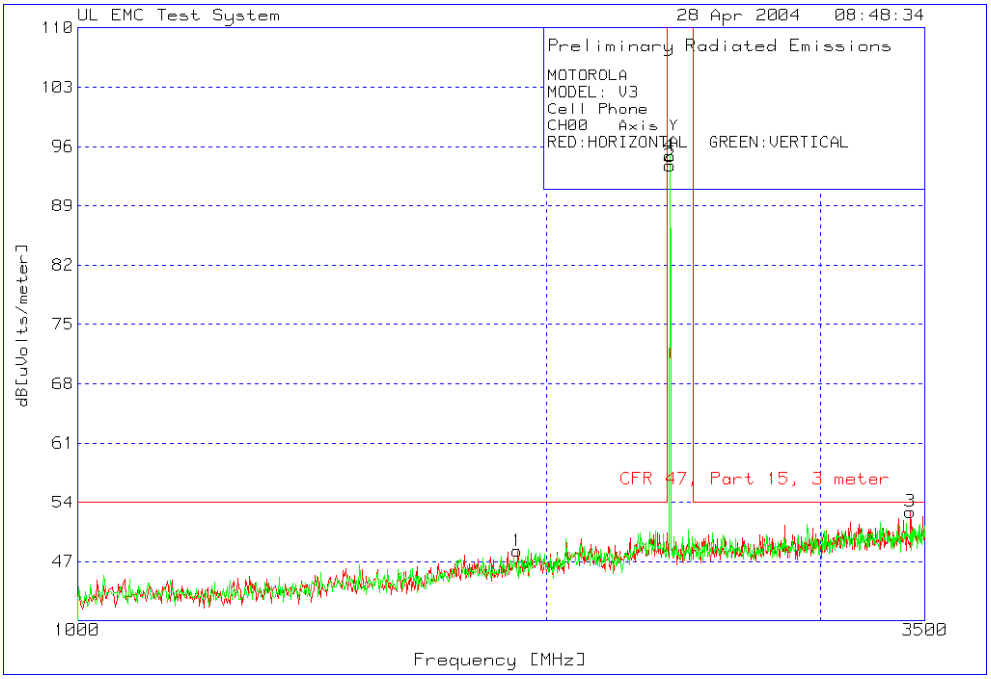


1-3GHz Low Channel X-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	2401.402	57.69 pk	2	28.8	88.49	999
		Height:150 Horz	**Margin [dB]**		**-910.51**	
3	3439.94	18.4 pk	2.3	31.2	51.9	54
		Height:150 Horz	**Margin [dB]**		**-2.1**	
Vertical 1000 - 3500MHz						
2	2401.402	36.29 pk	2	28.8	67.09	999
		Height:101 Vert	**Margin [dB]**		**-931.91**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

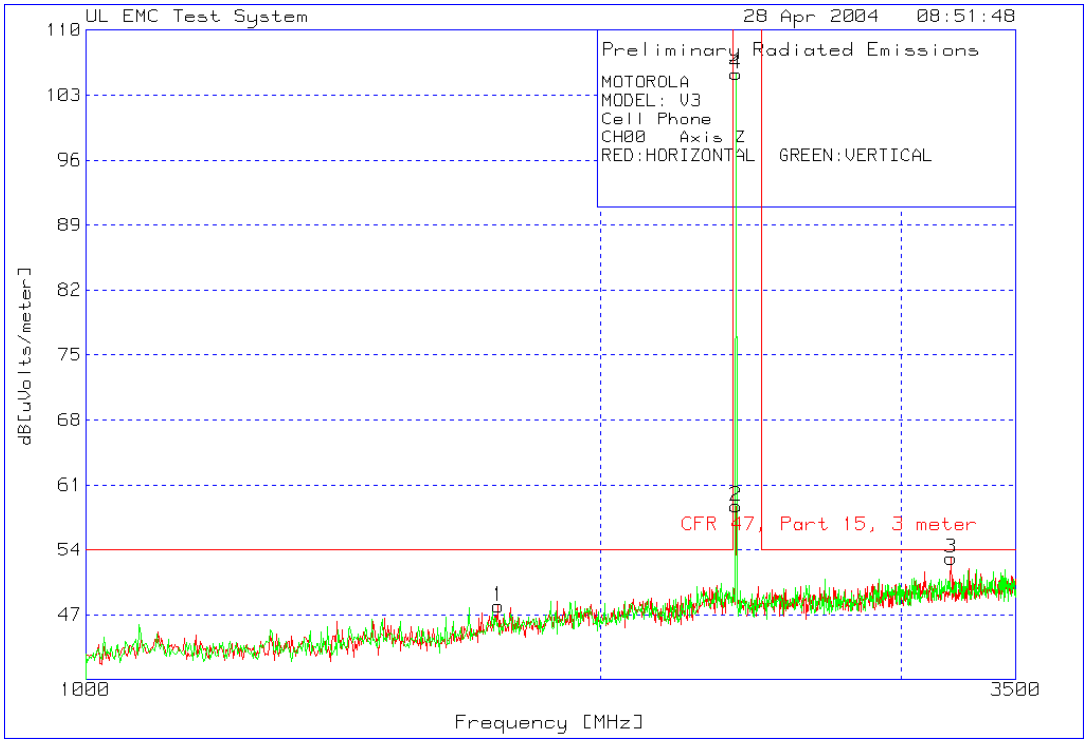


1-3GHz Low Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1915.916	18.66 pk	1.7	27.9	48.26	54
		Height:150 Horz	**Margin [dB]**		**-5.74**	
2	2401.402	62.95 pk	2	28.8	93.75	999
		Height:101 Horz	**Margin [dB]**		**-905.25**	
3	3424.925	19.48 pk	2.3	31.1	52.88	54
		Height:101 Horz	**Margin [dB]**		**-1.12**	
Vertical 1000 - 3500MHz						
4	2401. 402	64.1 pk	2	28.8	94.9	999
		Height:101 Vert	**Margin [dB]**		**-904.1**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

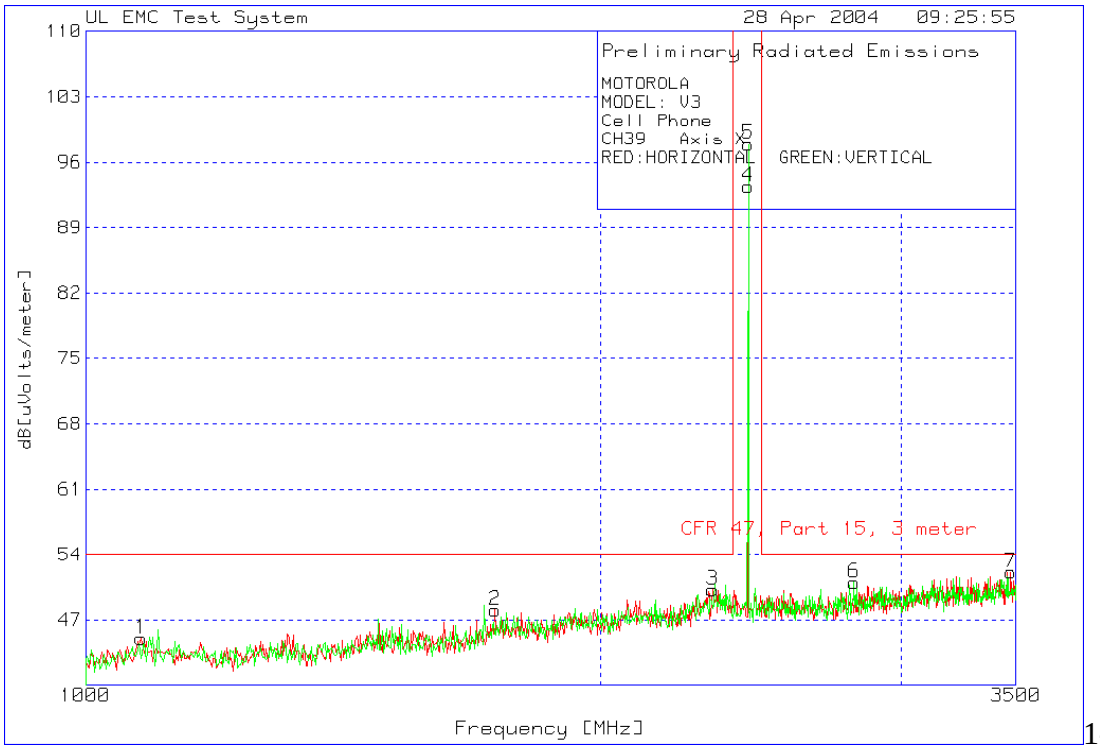


1-3GHz Low Channel Z-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1743.243	19.06 pk	1.5	27.4	47.96	54
		Height:150 Horz	**Margin [dB]**		**-6.04**	
2	2401.402	27.92 pk	2	28.8	58.72	999
		Height:150 Horz	**Margin [dB]**		**-940.28**	
3	3207.208	20.01 pk	2.4	30.7	53.11	54
		Height:150 Horz	**Margin [dB]**		**-.89**	
Vertical 1000 - 3500MHz						
4	2401.402	74.48 pk	2	28.8	105.28	999
		Height:101 Vert	**Margin [dB]**		**-893.72**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

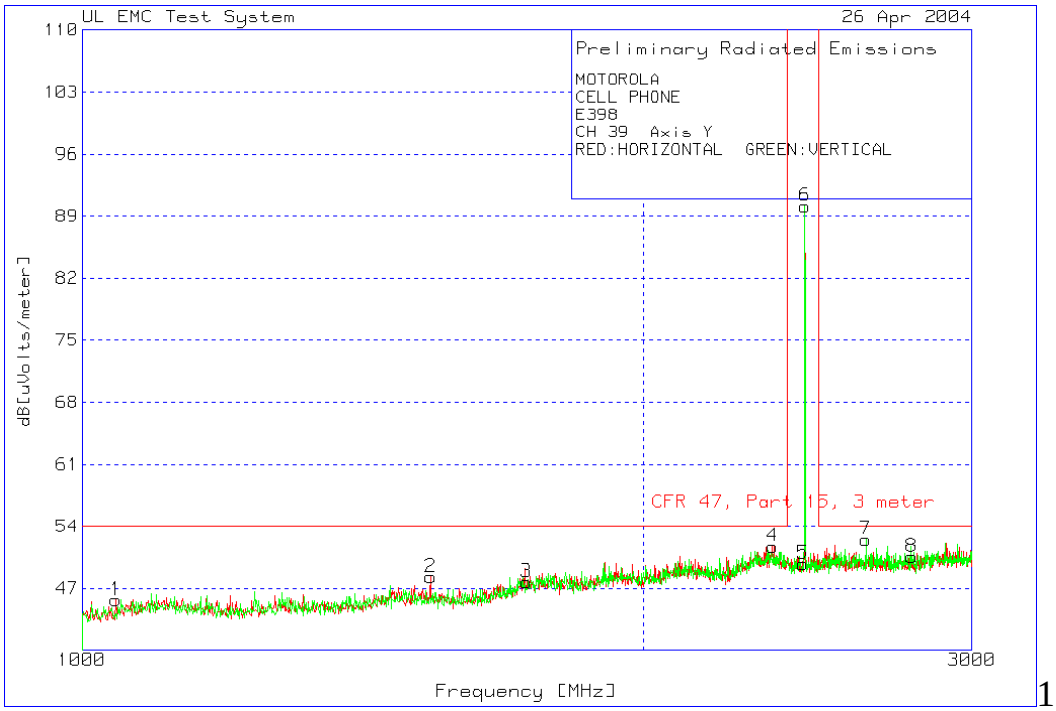


1-3GHz Mid-Channel X-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1077.578	18.51 pk	1.2	25.3	45.01	54
		Height:150 Horz	**Margin [dB]**		**-8.99**	
2	1735.736	19.15 pk	1.5	27.4	48.05	54
		Height:101 Horz	**Margin [dB]**		**-5.95**	
3	2326.327	19.62 pk	1.9	28.7	50.22	54
		Height:101 Horz	**Margin [dB]**		**-3.78**	
4	2441.442	62.6 pk	2	28.8	93.4	999
		Height:101 Horz	**Margin [dB]**		**-905.6**	
7	3474.975	18.52 pk	2.4	31.2	52.12	54
		Height:101 Horz	**Margin [dB]**		**-1.88**	
Vertical 1000 - 3500MHz						
5	2441.442	67.13 pk	2	28.8	97.93	999
		Height:101 Vert	**Margin [dB]**		**-901.07**	
6	2814.315	19.23 pk	2.1	29.7	51.03	54
		Height:101 Vert	**Margin [dB]**		**-2.97**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

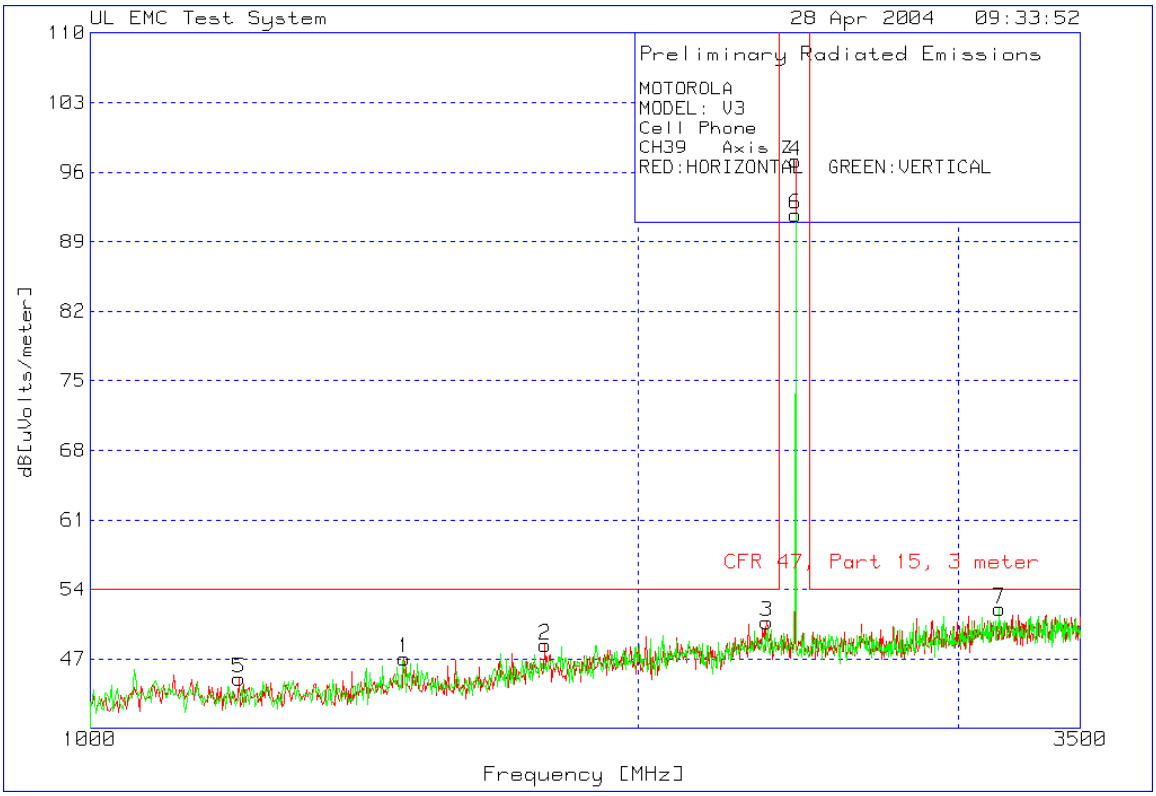


1-3GHz Mid-Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1262.763	19.29 pk	1.2	25.9	46.39	54
	Height:101 Horz		**Margin [dB]**		**-7.61**	
2	2326.327	19.68 pk	1.9	28.7	50.28	54
	Height:101 Horz		**Margin [dB]**		**-3.72**	
3	2441.442	28.43 pk	2	28.8	59.23	999
	Height:101 Horz		**Margin [dB]**		**-939.77**	
5	3049.55	19.39 pk	2.2	30.3	51.89	54
	Height:150 Horz		**Margin [dB]**		**-2.11**	
6	3309.81	18.95 pk	2.3	30.9	52.15	54
	Height:101 Horz		**Margin [dB]**		**-1.85**	
Vertical 1000 - 3500MHz						
4	2441.442	39.05 pk	2	28.8	69.85	999
	Height:150 Vert		**Margin [dB]**		**-929.15**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

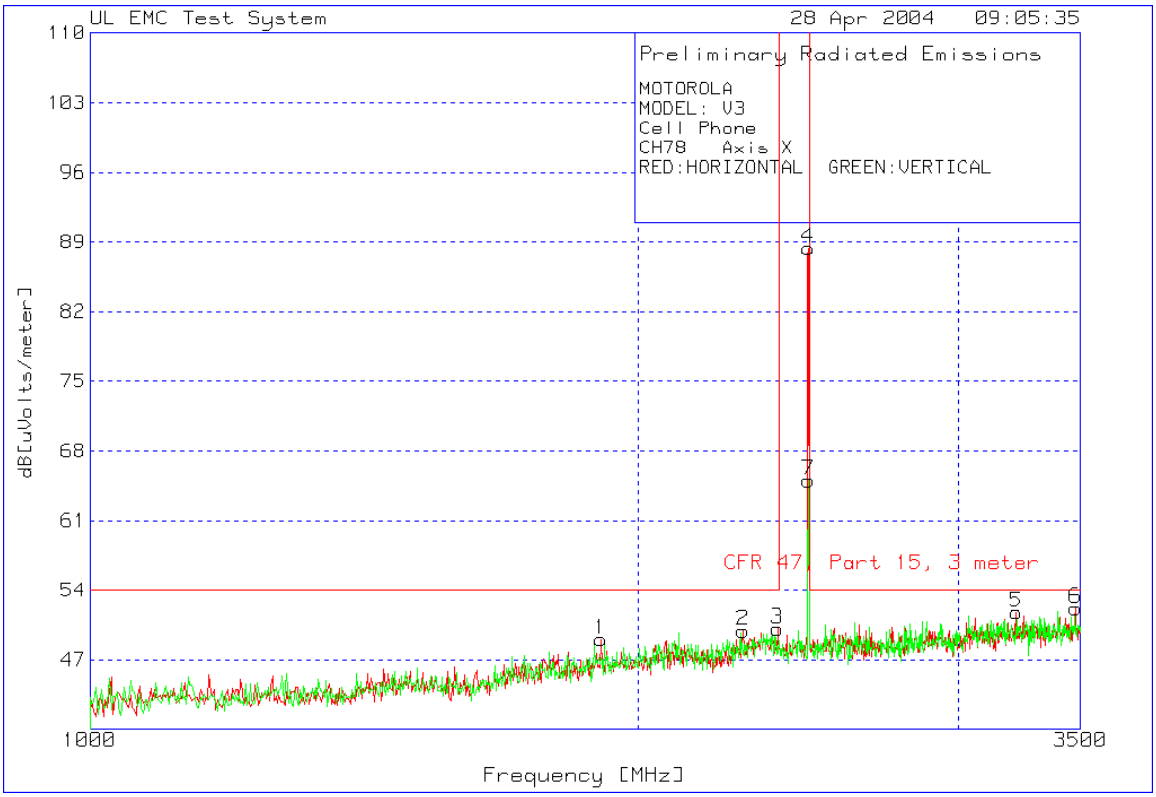


1-3GHz Mid-Channel Z-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1487.988	18.89 pk	1.5	26.7	47.09	54
		Height:150 Horz	**Margin [dB]**		**-6.91**	
2	1778.278	19.3 pk	1.6	27.5	48.4	54
		Height:101 Horz	**Margin [dB]**		**-5.6**	
3	2353.854	20.12 pk	1.9	28.7	50.72	54
		Height:101 Horz	**Margin [dB]**		**-3.28**	
4	2441.442	66.32 pk	2	28.8	97.12	999
		Height:101 Horz	**Margin [dB]**		**-901.88**	
5	1207.708	17.94 pk	1.3	25.8	45.04	54
		Height:101 Horz	**Margin [dB]**		**-8.96**	
Vertical 1000 - 3500MHz						
6	2441.442	60.94 pk	2	28.8	91.74	999
		Height:101 Vert	**Margin [dB]**		**-907.26**	
7	3159.66	19.05 pk	2.4	30.6	52.05	54
		Height:101 Vert	**Margin [dB]**		**-1.95**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

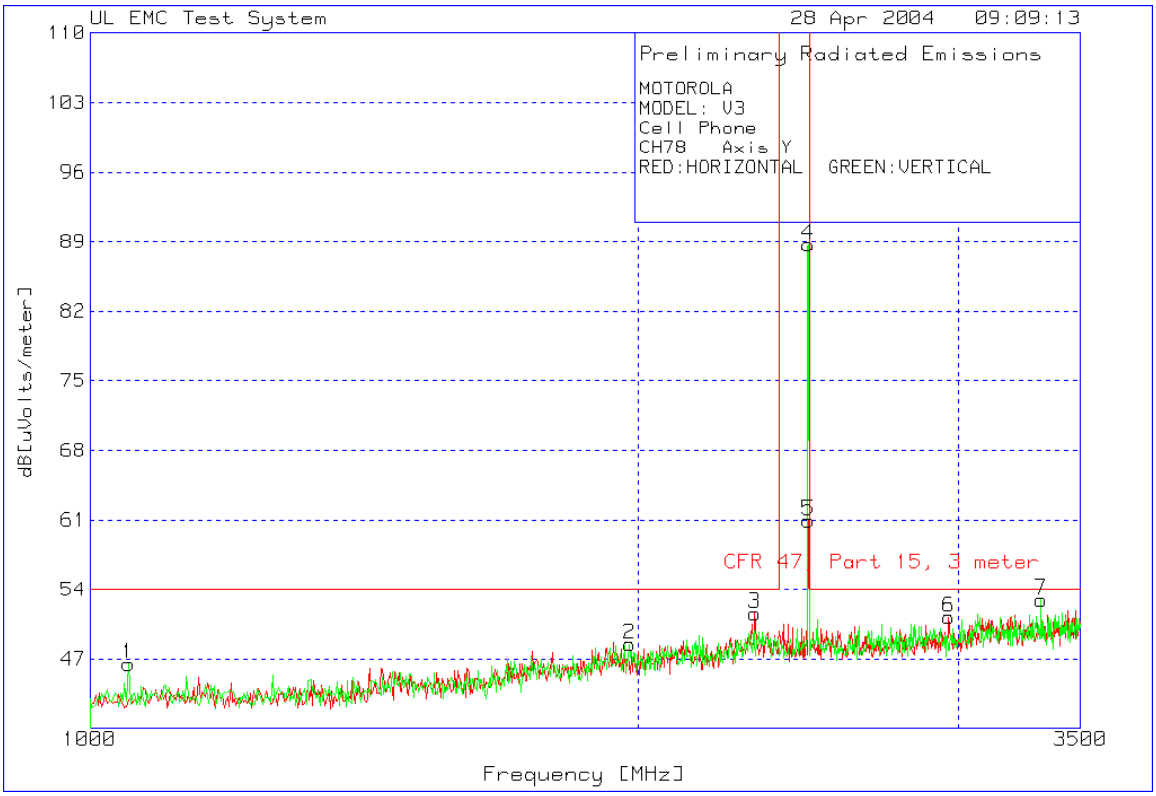


1-3GHz High-Channel X-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1908.409	19.44 pk	1.7	27.9	49.04	54
		Height:101 Horz	**Margin [dB]**		**-4.96**	
2	2283.784	19.53 pk	1.8	28.6	49.93	54
		Height:101 Horz	**Margin [dB]**		**-4.07**	
3	2386.387	19.4 pk	2	28.7	50.1	54
		Height:101 Horz	**Margin [dB]**		**-3.9**	
4	2481.482	57.58 pk	1.9	28.9	88.38	999
		Height:150 Horz	**Margin [dB]**		**-910.62**	
5	3227.228	18.67 pk	2.4	30.7	51.77	54
		Height:101 Horz	**Margin [dB]**		**-2.23**	
6	3477.478	18.48 pk	2.4	31.3	52.18	54
		Height:150 Horz	**Margin [dB]**		**-1.82**	
Vertical 1000 - 3500MHz						
7	2481.482	34.24 pk	1.9	28.9	65.04	999
		Height:150 Vert	**Margin [dB]**		**-933.96**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

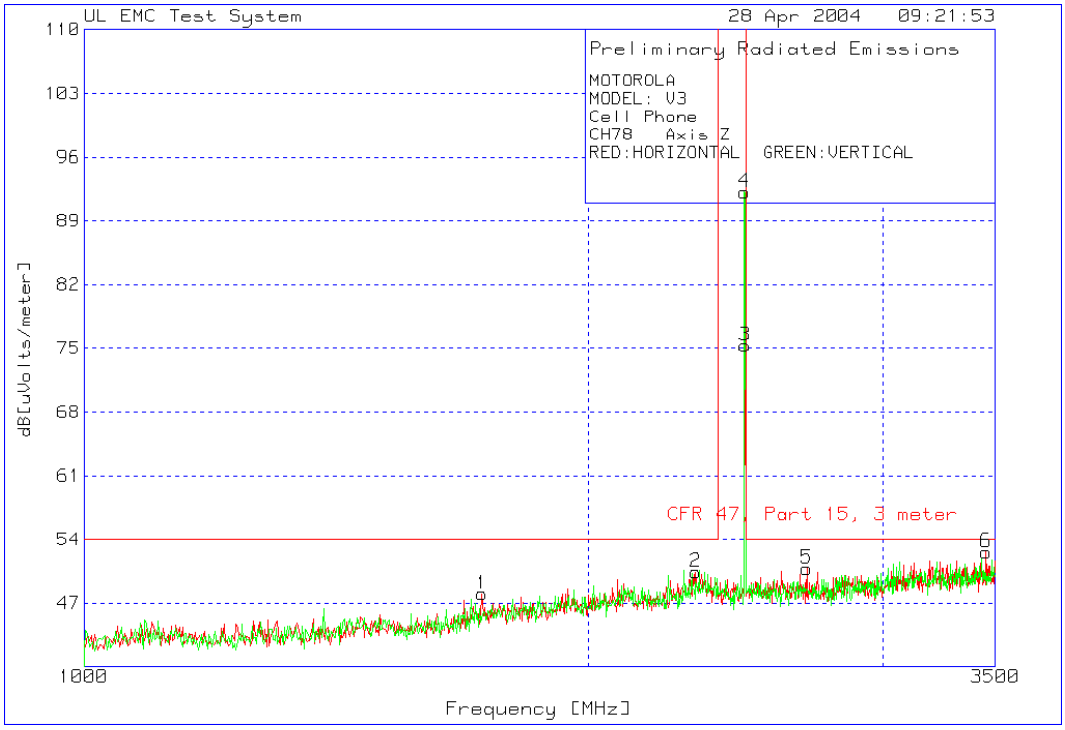

UL EMC Test System
28 Apr 2004 09:09:13
Preliminary Radiated Emissions
MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis Y
RED:HORIZONTAL GREEN:VERTICAL
CFR 47 Part 15, 3 meter
dB[uVolts/meter]
110
103
96
89
82
75
68
61
54
47
1000
3500
Frequency [MHz]

1-3GHz High-Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
3	2318.819	21.11 pk	1.9	28.6	51.61	54
		Height:101 Horz	**Margin [dB]**	**-2.39**		
5	2481.482	30.11 pk	1.9	28.9	60.91	999
		Height:101 Horz	**Margin [dB]**	**-938.09**		
6	2961.962	19.09 pk	2	30.1	51.19	54
		Height:101 Horz	**Margin [dB]**	**-2.81**		
Vertical 1000 - 3500MHz						
1	1050.05	20.01 pk	1.2	25.3	46.51	54
		Height:150 Vert	**Margin [dB]**	**-7.49**		
2	1978.479	18.66 pk	1.7	28.1	48.46	54
		Height:101 Vert	**Margin [dB]**	**-5.54**		
4	2481.482	57.9 pk	1.9	28.9	88.7	999
		Height:101 Vert	**Margin [dB]**	**-910.3**		
7	3329.83	19.76 pk	2.3	30.9	52.96	54
		Height:150 Vert	**Margin [dB]**	**-1.04**		

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

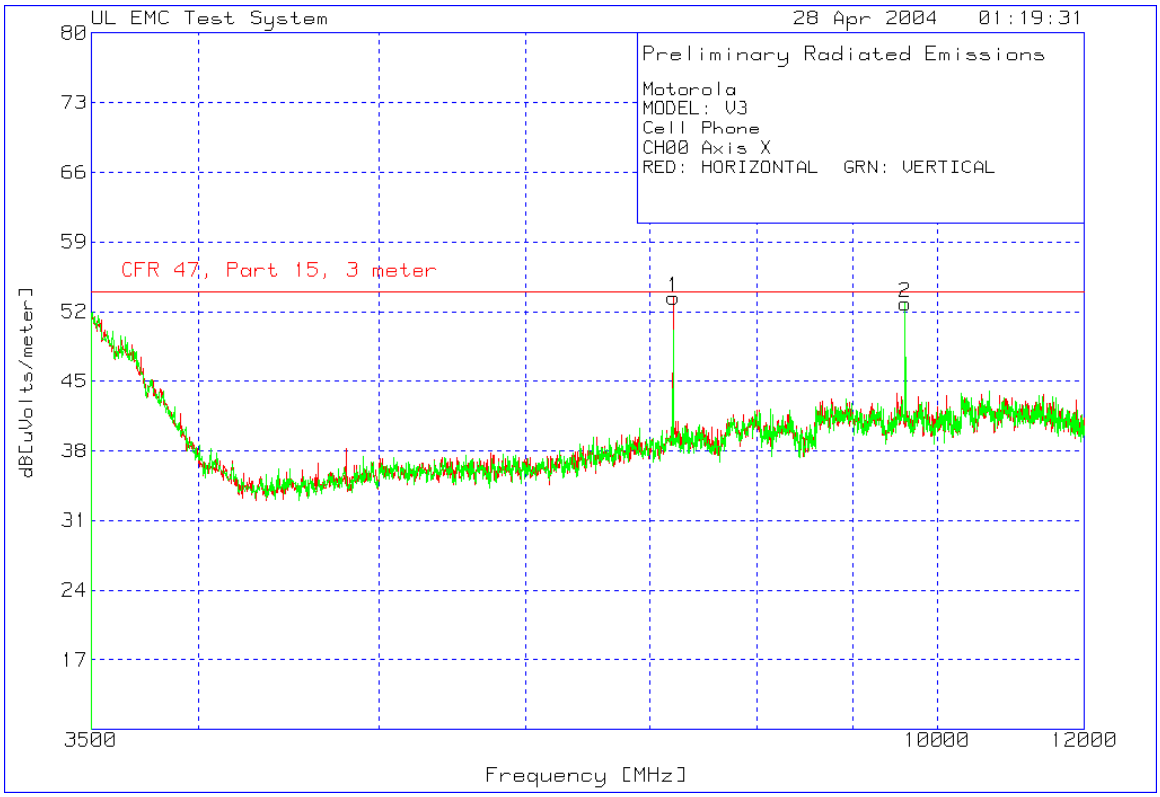


1-3GHz High-Channel Z-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 1000 - 3500MHz						
1	1728.228	19.11 pk	1.5	27.4	48.01	54
	Height:101 Horz	**Margin [dB]**		**-5.99**		
2	2318.819	19.93 pk	1.9	28.6	50.43	54
	Height:101 Horz	**Margin [dB]**		**-3.57**		
3	2481.482	44.49 pk	1.9	28.9	75.29	999
	Height:101 Horz	**Margin [dB]**		**-923.71**		
5	2701.702	19.42 pk	2	29.4	50.82	54
	Height:150 Horz	**Margin [dB]**		**-3.18**		
6	3454.955	19.14 pk	2.3	31.2	52.64	54
	Height:150 Horz	**Margin [dB]**		**-1.36**		
Vertical 1000 - 3500MHz						
4	2478.979	61.38 pk	1.9	28.9	92.18	999
	Height:101 Vert	**Margin [dB]**		**-906.82**		

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

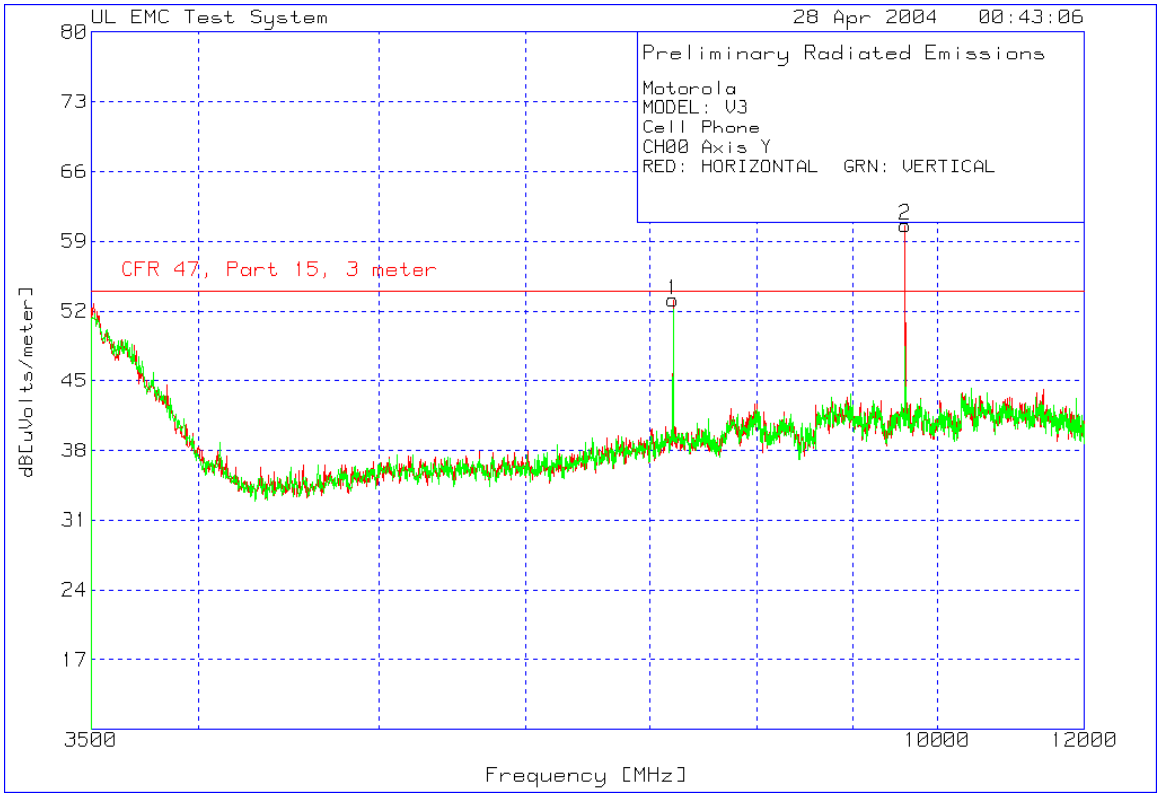


3-12GHz Low-Channel X-Orientation

Motorola
MODEL: V3
Cell Phone
CH00 Axis X
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 3500 - 12000MHz						
1	7207.483	62.22 pk	-45.3	36.5	53.42	54
		Height:101 Horz	**Margin [dB]**		**-.58**	
Vertical 3500 - 12000MHz						
2	9608.844	62.25 pk	-47.7	38.3	52.85	54
		Height:101 Vert	**Margin [dB]**		**-1.15**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

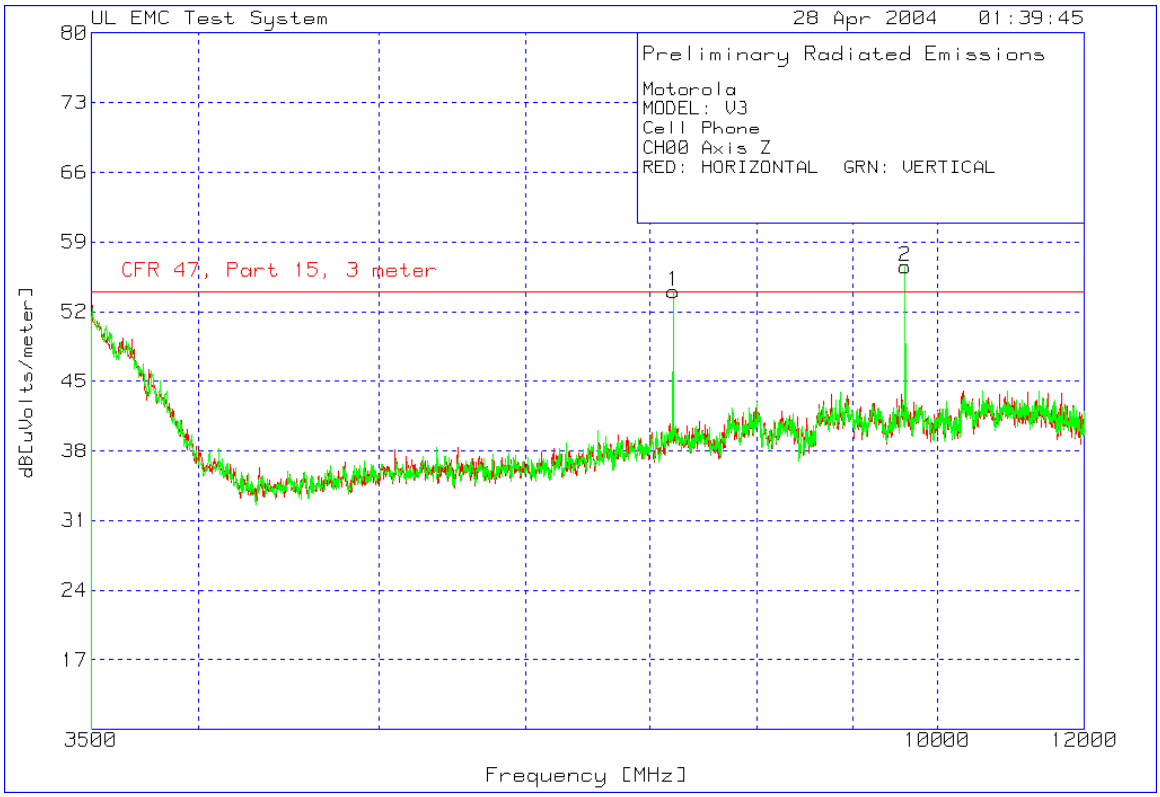


3-12GHz Low-Channel Y-Orientation

Motorola
MODEL: V3
Cell Phone
CH00 Axis Y
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 3500 - 12000MHz						
1	7204.082	62 pk	-45.4	36.5	53.1	54
Height:150 Horz				**Margin[dB]**	**-0.9**	
2	9608.844	70.01 pk	-47.7	38.3	60.61	54
Height:150 Horz				**Margin[dB]**	**6.61**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



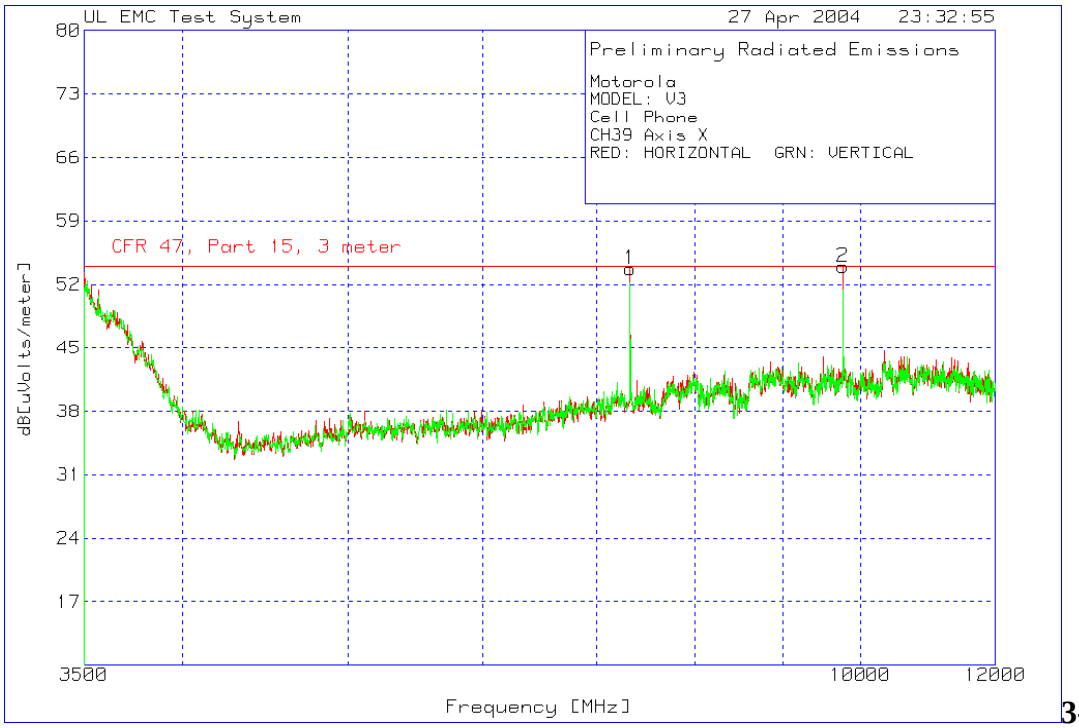
3-12GHz Low-Channel Z-Orientation

Motorola
MODEL: V3
Cell Phone
CH00 Axis Z
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Vertical 3500 - 12000MHz						
1	7207.483	62.81 pk	-45.3	36.5	54.01	54
Height:101 Vert				Margin[dB]	0.01	
2	9608.844	65.9 pk	-47.7	38.3	56.5	54
Height:101 Vert				Margin[dB]	2.5	

The margins for the signals measured above are positive. The duty cycle correction factor was applied:

Frequency (MHz)	Level (dBuV)	Duty Cycle Correction Factor	Corrected Level	Limit	Corrected Margin
7207.483	54.01	-30.66	23.35	54	**-30.65**
9608.844	56.5	-30.66	25.84	54	**-28.16**

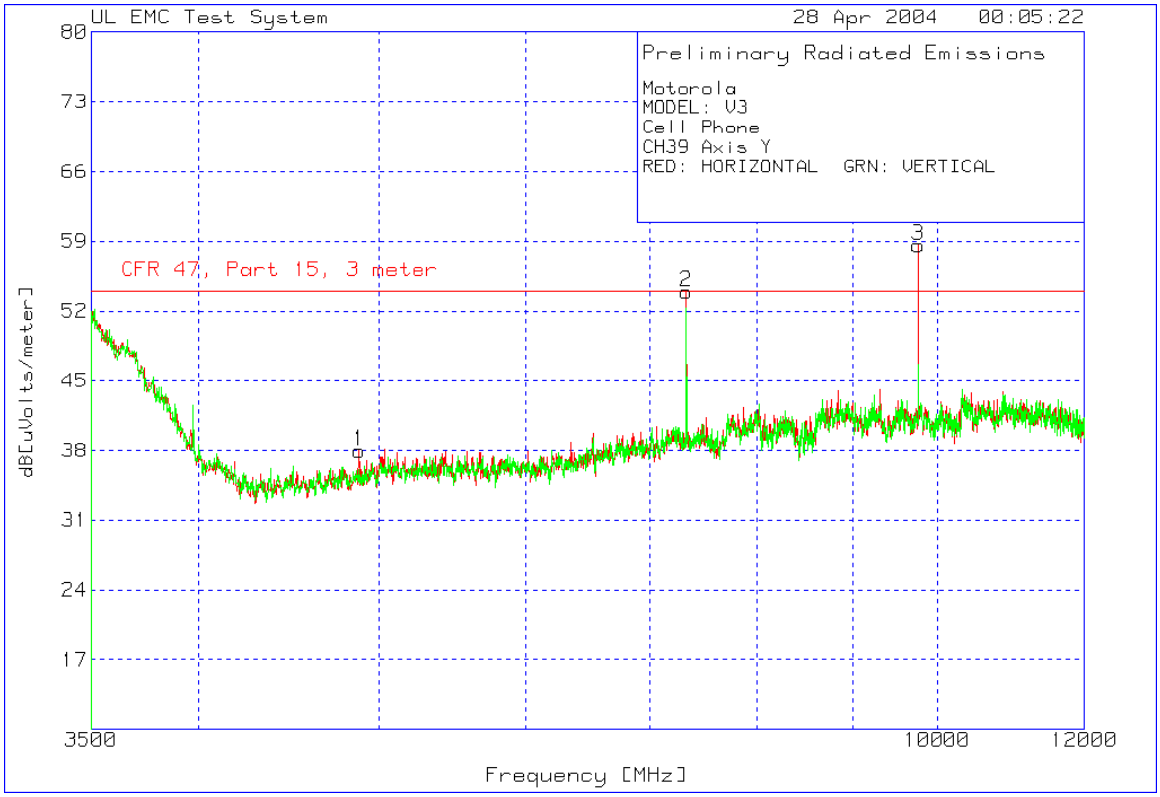


3-12GHz Mid-Channel X-Orientation

Motorola
MODEL: V3
Cell Phone
CH39 Axis X
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 3500 - 12000MHz						
1	7323.13	62.13 pk	-44.9	36.5	53.73	54
Height:150 Horz				**Margin[dB]**	**-0.27**	
2	9765.307	62.87 pk	-47.4	38.5	53.97	54
Height:101 Horz				**Margin[dB]**	**-0.03**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



3-12GHz Mid-Channel Y-Orientation

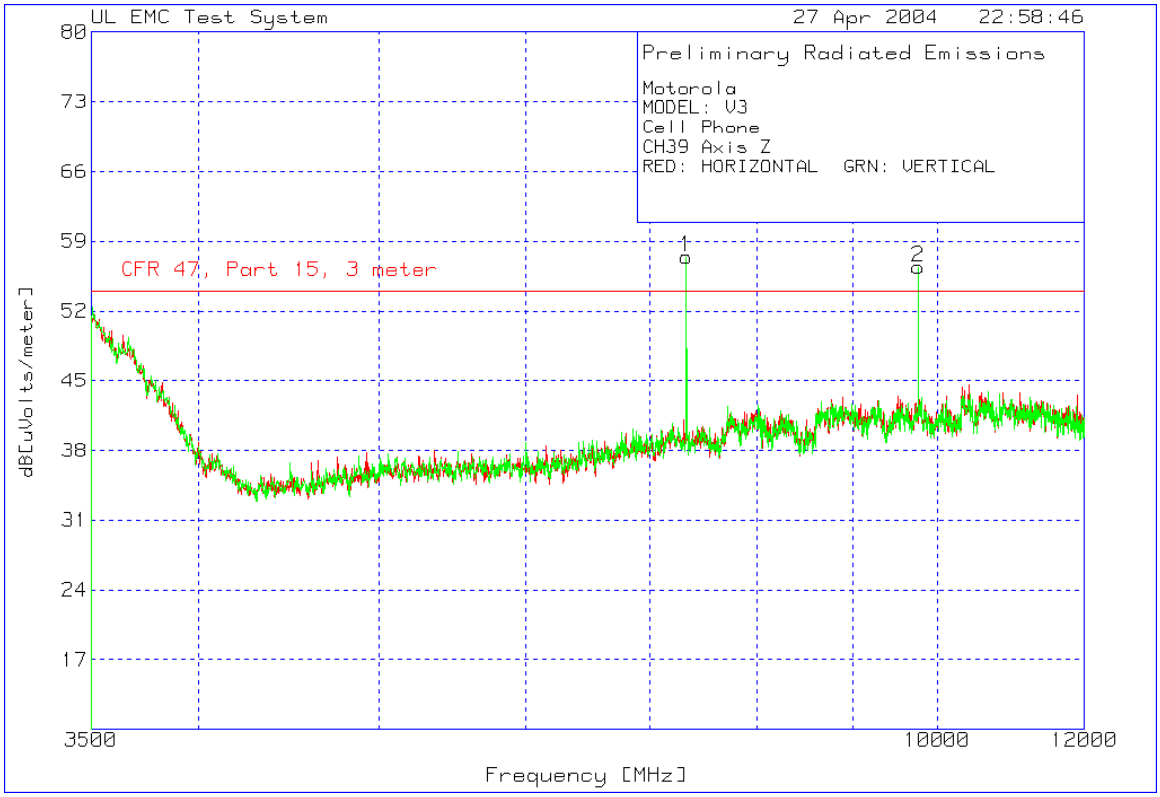
Cell Phone
CH39 Axis Y
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 3500 - 12000MHz						
1	4880.953	53.49 pk	-49.4	33.9	37.99	54
Height:101 Horz				**Margin[dB]**	**-16.01**	
2	7323.13	62.32 pk	-44.9	36.5	53.92	54
Height:150 Horz				**Margin[dB]**	**-0.08**	
3	9765.307	67.49 pk	-47.4	38.5	58.59	54
Height:150 Horz				**Margin[dB]**	**4.59**	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signal:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
9765.307	58.59	-30.66	27.93	54	**-26.07**



3-12GHz Mid-Channel Z-Orientation

Motorola
MODEL: V3
Cell Phone
CH39 Axis Z
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Vertical 3500 - 12000MHz						
1	7323.13	65.83 pk	-44.9	36.5	57.43	54
Height:150 Vert				**Margin[dB]**	**3.43**	
2	9765.307	65.32 pk	-47.4	38.5	56.42	54
Height:101 Vert				**Margin[dB]**	2.42	

LIMIT 1: CFR 47, Part 15, 3 meter
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signals:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
7323.13	57.43	-30.66	26.77	54	**-27.23**
9765.307	56.42	-30.66	25.76	54	**-28.24**

12-18GHz Low-Channel X-Orientation

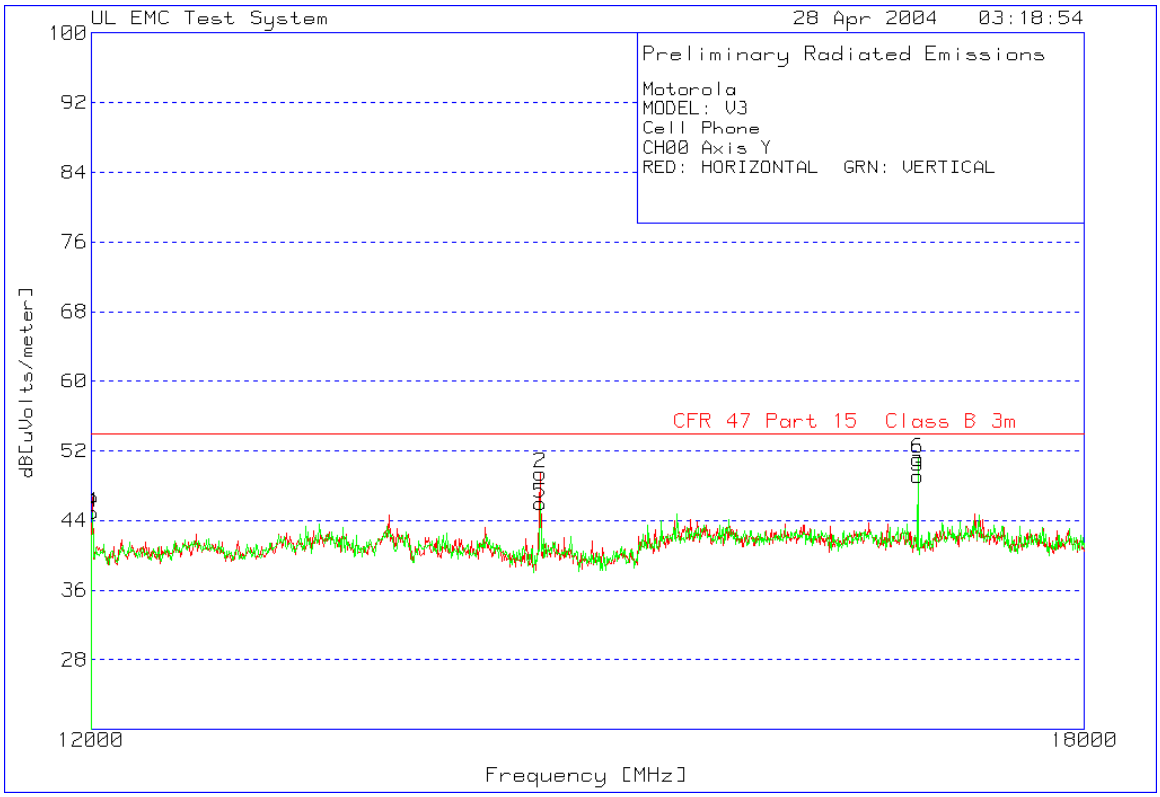
Motorola
MODEL: V3
Cell Phone
CH00 Axis X
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12006.006	57.69 pk	-49.1	39.4	47.99	54
	Height:101 Horz		**Margin [dB]**		**-6.01**	
2	14414.414	52.49 pk	-43.1	39.8	49.19	54
	Height:150 Horz		**Margin [dB]**		**-4.81**	
Vertical 12000 - 18000MHz						
3	16816.817	58.24 pk	-42.1	40.1	56.24	54
	Height:101 Vert		**Margin [dB]**		**2.24**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to the over limit signal:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
16816.817	56.24	-30.66	25.58	54	**--28.23**



12-18GHz Low-Channel Y-Orientation

Motorola
MODEL: V3
Cell Phone
CH00 Axis Y
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12006.006	56.46 pk	-49.1	39.4	46.76	54
		Height:101 Horz	**Margin [dB]**		**-7.24**	
2	14414.414	52.72 pk	-43.1	39.8	49.42	54
		Height:101 Horz	**Margin [dB]**		**-4.58**	
3	16816.817	51.11 pk	-42.1	40.1	49.11	54
		Height:101 Horz	**Margin [dB]**		**-4.89**	
Vertical 12000 - 18000MHz						
4	12006.006	54.62 pk	-49.1	39.4	44.92	54
		Height:150 Vert	**Margin [dB]**		**-9.08**	
5	14414.414	49.24 pk	-43.1	39.8	45.94	54
		Height:101 Vert	**Margin [dB]**		**-8.06**	
6	16816.817	53.11 pk	-42.1	40.1	51.11	54
		Height:101 Vert	**Margin [dB]**		**-2.89**	

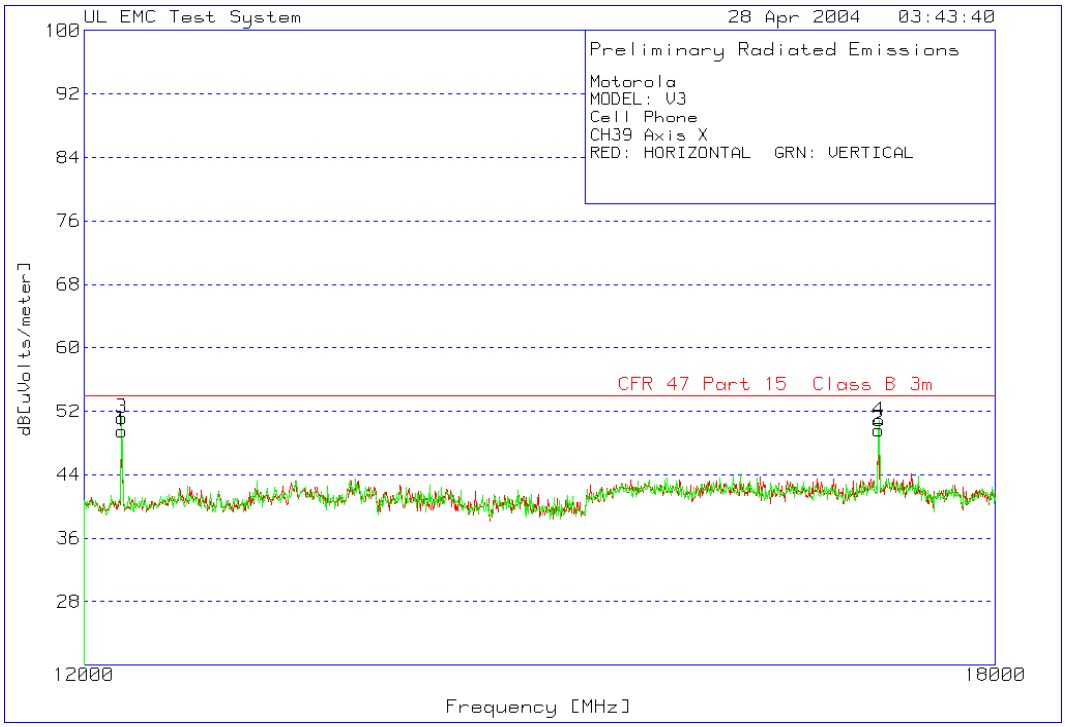
LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

12-18GHz Low-Channel Z-Orientation

Motorola
MODEL: V3
Cell Phone
CH00 Axis Z
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12006.006	56.39 pk	-49.1	39.4	46.69	54
	Height:150 Horz		**Margin [dB]**		**-7.31**	
2	14408.408	50.91 pk	-43	39.8	47.71	54
	Height:150 Horz		**Margin [dB]**		**-6.29**	
3	16816.817	50.53 pk	-42.1	40.1	48.53	54
	Height:150 Horz		**Margin [dB]**		**-5.47**	
Vertical 12000 - 18000MHz						
4	12006.006	58.79 pk	-49.1	39.4	49.09	54
	Height:150 Vert		**Margin [dB]**		**-4.91**	
5	14414.414	45.77 pk	-43.1	39.8	42.47	54
	Height:101 Vert		**Margin [dB]**		**-11.53**	
6	16816.817	49.96 pk	-42.1	40.1	47.96	54
	Height:150 Vert		**Margin [dB]**		**-6.04**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



12-18GHz Mid-Channel X-Orientation

Motorola
MODEL: V3
Cell Phone
CH39 Axis X
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12204.204	58.02 pk	-47.9	39.4	49.52	54
	Height:101 Horz	**Margin [dB]**		**-4.48**		
2	17087.087	51.07 pk	-41.7	40.3	49.67	54
	Height:101 Horz	**Margin [dB]**		**-4.33**		
Vertical 12000 - 18000MHz						
3	12204.204	59.69 pk	-47.9	39.4	51.19	54
	Height:150 Vert	**Margin [dB]**		**-2.81**		
4	17093.093	52.17 pk	-41.6	40.3	50.87	54
	Height:101 Vert	**Margin [dB]**		**-3.13**		

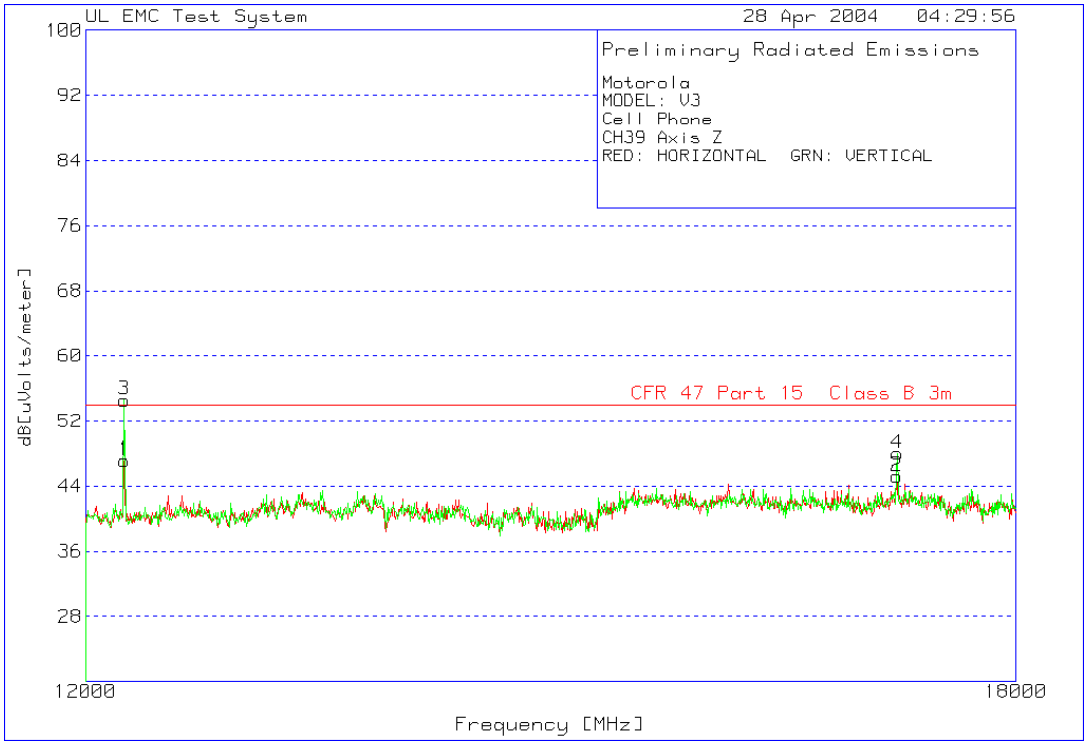
LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

12-18GHz Mid-Channel Y-Orientation

Motorola
MODEL: V3
Cell Phone
CH39 Axis Y
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12204.204	59.24 pk	-47.9	39.4	50.74	54
	Height:101 Horz	**Margin [dB]**		**-3.26**		
2	17087.087	50.19 pk	-41.7	40.3	48.79	54
	Height:101 Horz	**Margin [dB]**		**-5.21**		
Vertical 12000 - 18000MHz						
3	12204.204	55.43 pk	-47.9	39.4	46.93	54
	Height:101 Vert	**Margin [dB]**		**-7.07**		
4	17093.093	47.31 pk	-41.6	40.3	46.01	54
	Height:101 Vert	**Margin [dB]**		**-7.99**		

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



12-18GHz Mid-Channel Z-Orientation

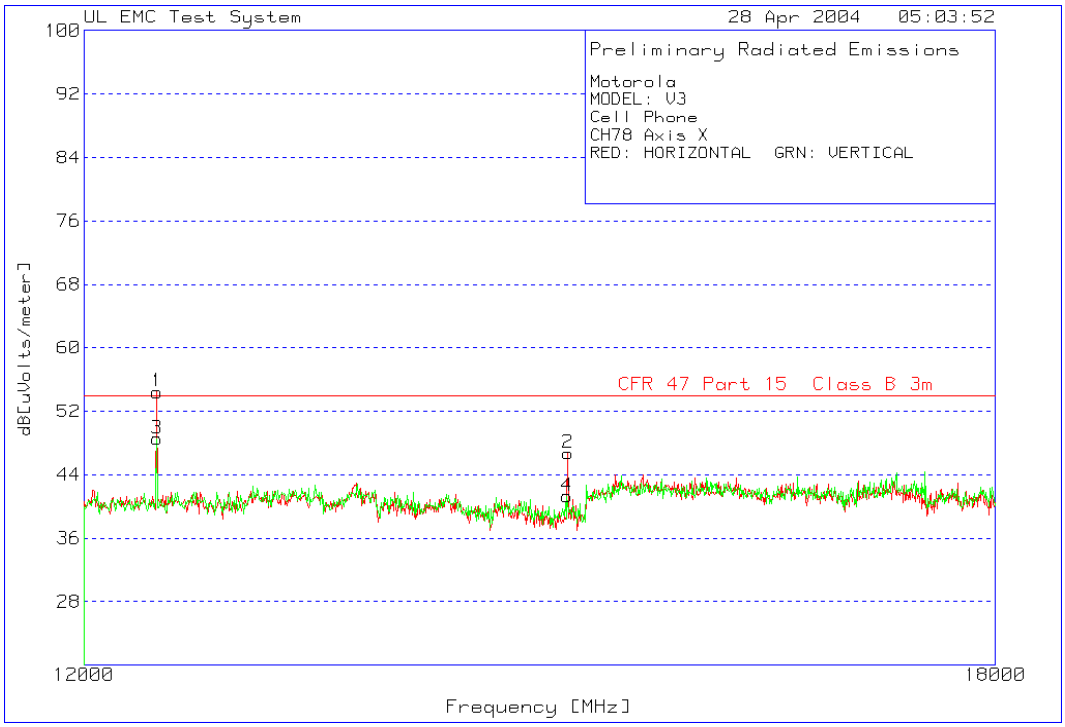
Motorola
MODEL: V3
Cell Phone
CH39 Axis Z
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12204.204	55.65 pk	-47.9	39.4	47.15	54
		Height:101 Horz	**Margin [dB]**		**-6.85**	
2	17087.087	46.66 pk	-41.7	40.3	45.26	54
		Height:101 Horz	**Margin [dB]**		**-8.74**	
Vertical 12000 - 18000MHz						
3	12204.204	63.1 pk	-47.9	39.4	54.6	54
		Height:150 Vert	**Margin [dB]**		**.6**	
4	17093.093	49.33 pk	-41.6	40.3	48.03	54
		Height:101 Vert	**Margin [dB]**		**-5.97**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signals:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
12204.204	54.6	-30.66	23.94	54	**-30.06**



12-18GHz High-Channel X-Orientation

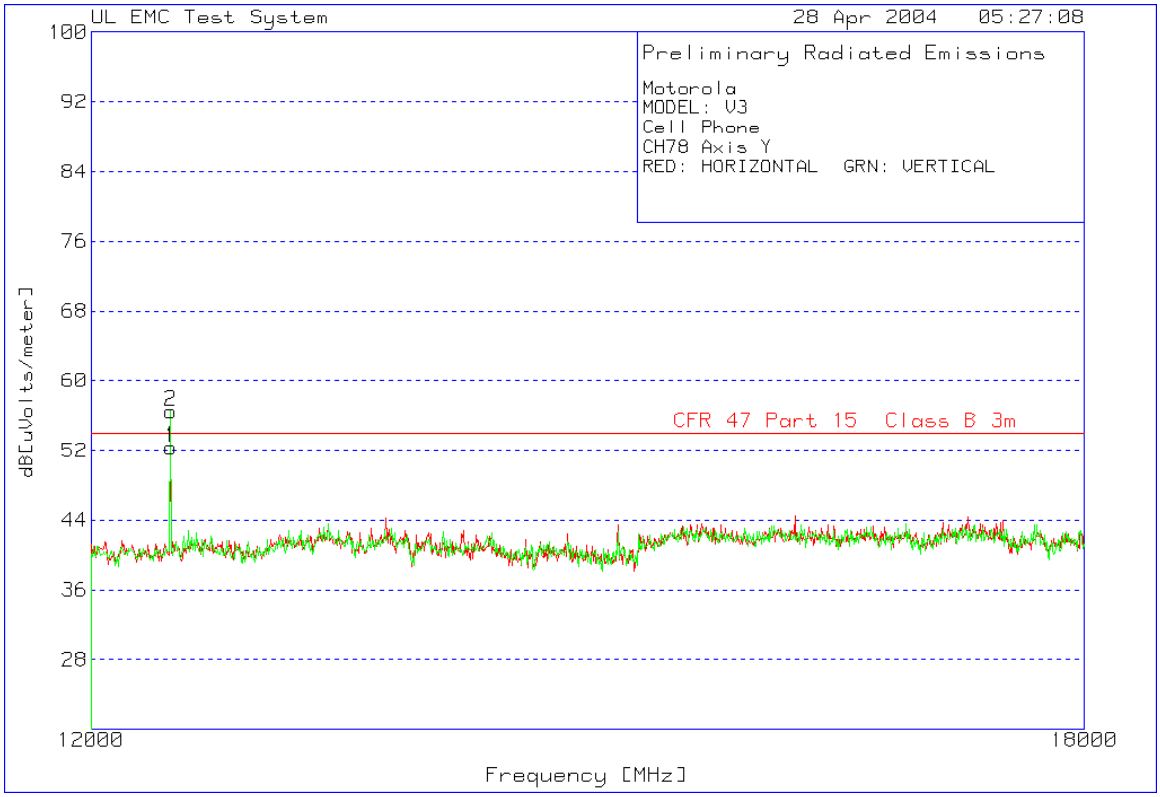
Motorola
MODEL: V3
Cell Phone
CH78 Axis X
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12396.396	62.86 pk	-47.8	39.4	54.46	54
	Height:150 Horz		**Margin [dB]**		**.46**	
2	14882.883	48.91 pk	-42	39.8	46.71	54
	Height:101 Horz		**Margin [dB]**		**-7.29**	
Vertical 12000 - 18000MHz						
3	12396.396	56.95 pk	-47.8	39.4	48.55	54
	Height:101 Vert		**Margin [dB]**		**-5.45**	
4	14876.877	43.69 pk	-42.2	39.8	41.29	54
	Height:150 Vert		**Margin [dB]**		**-12.71**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signal:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
12396.396	54.46	-30.66	23.8	54	**-30.2**



12-18GHz High-Channel Y-Orientation

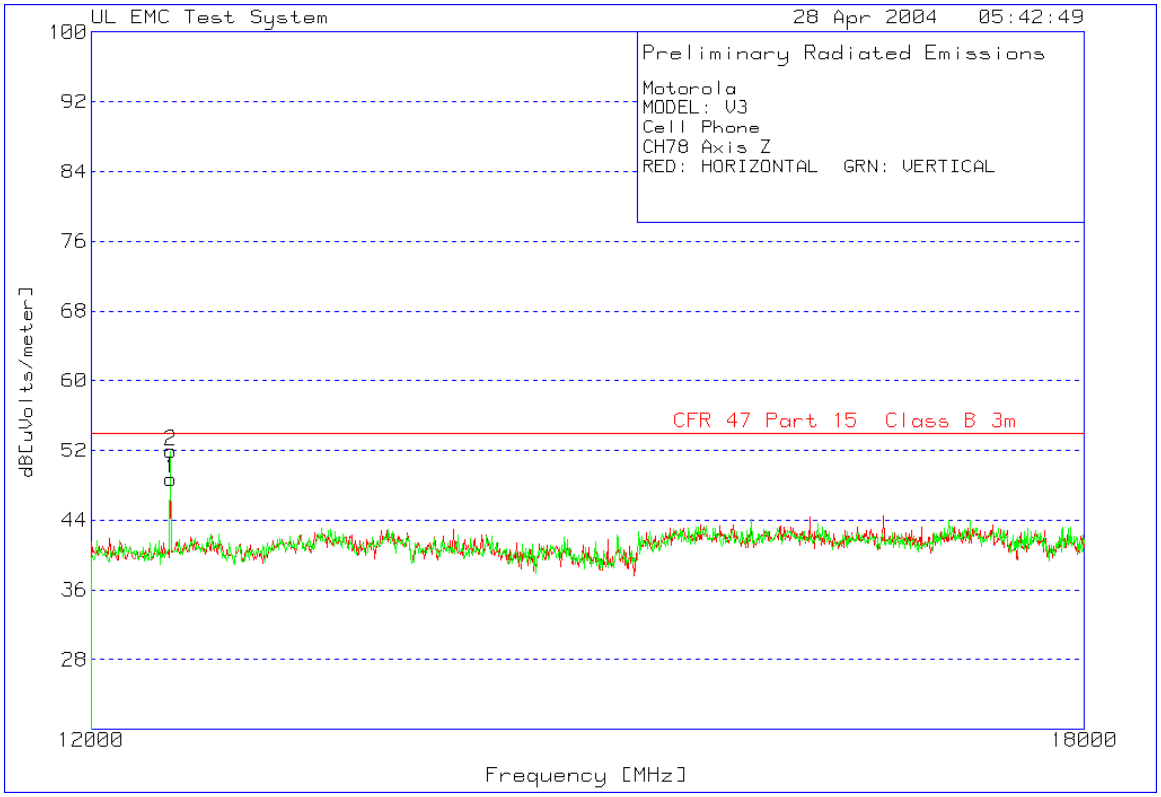
Motorola
MODEL: V3
Cell Phone
CH78 Axis Y
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12396.396	60.75 pk	-47.8	39.4	52.35	54
		Height:101 Horz	**Margin [dB]**		**-1.65**	
Vertical 12000 - 18000MHz						
2	12396.396	64.92 pk	-47.8	39.4	56.52	54
		Height:101 Vert	**Margin [dB]**		**2.52**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signal:

Frequency (MHz)	**Level (dBuV)**	**Duty Cycle Correction Factor**	**Corrected Level**	**Limit**	**Corrected Margin**
12396.396	56.52	-30.66	25.86	54	**-28.14**

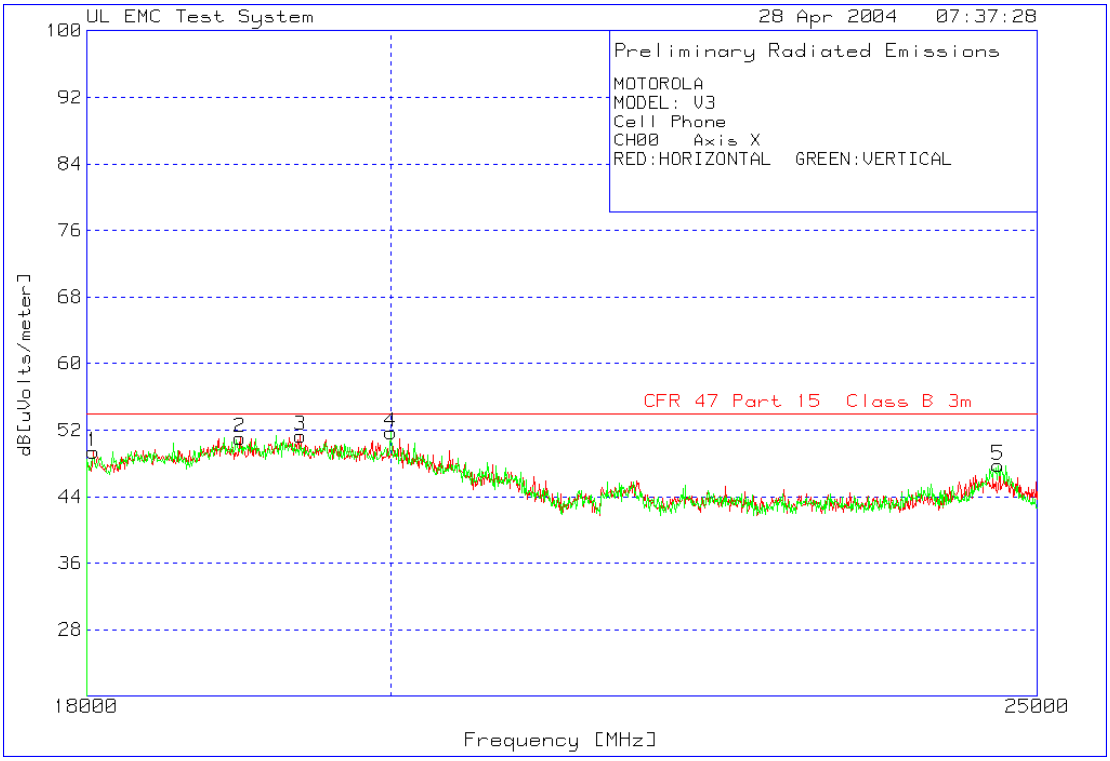


12-18GHz High-Channel Z-Orientation

Motorola
MODEL: V3
Cell Phone
CH78 Axis Z
RED: HORIZONTAL GRN: VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 12000 - 18000MHz						
1	12396.396	57.17 pk	-47.8	39.4	48.77	54
		Height:150 Horz	**Margin [dB]**	**-5.23**		
Vertical 12000 - 18000MHz						
2	12396.396	60.33 pk	-47.8	39.4	51.93	54
		Height:150 Vert	**Margin [dB]**	**-2.07**		

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

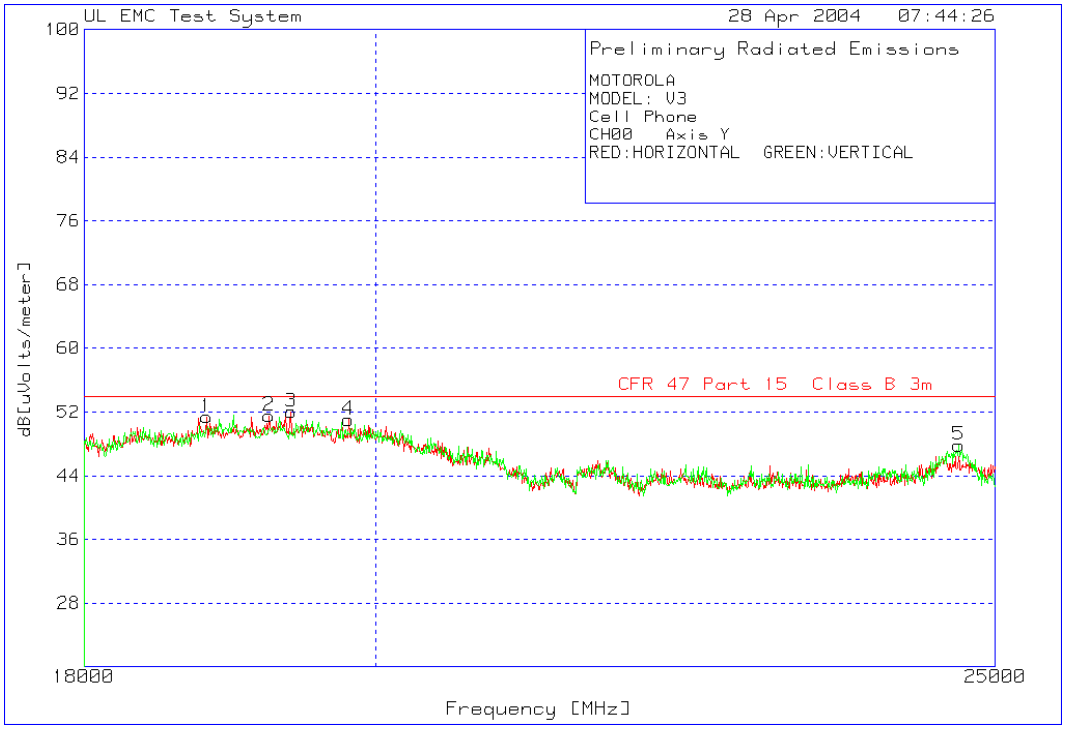


18-25GHz Low-Channel X-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	18042.042	69.89 pk	-60.5	40	49.39	54
		Height:101 Horz	**Margin [dB]**		**-4.61**	
2	18980.981	71.49 pk	-60.6	40.2	51.09	54
		Height:101 Horz	**Margin [dB]**		**-2.91**	
3	19380.38	71.65 pk	-60.6	40.3	51.35	54
		Height:101 Horz	**Margin [dB]**		**-2.65**	
Vertical 18000 - 25000MHz						
4	19996.997	72.63 pk	-61.1	40.2	51.73	54
		Height:101 Vert	**Margin [dB]**		**-2.27**	
5	24663.664	66.27 pk	-58.8	40.3	47.77	54
		Height:150 Vert	**Margin [dB]**		**-6.23**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

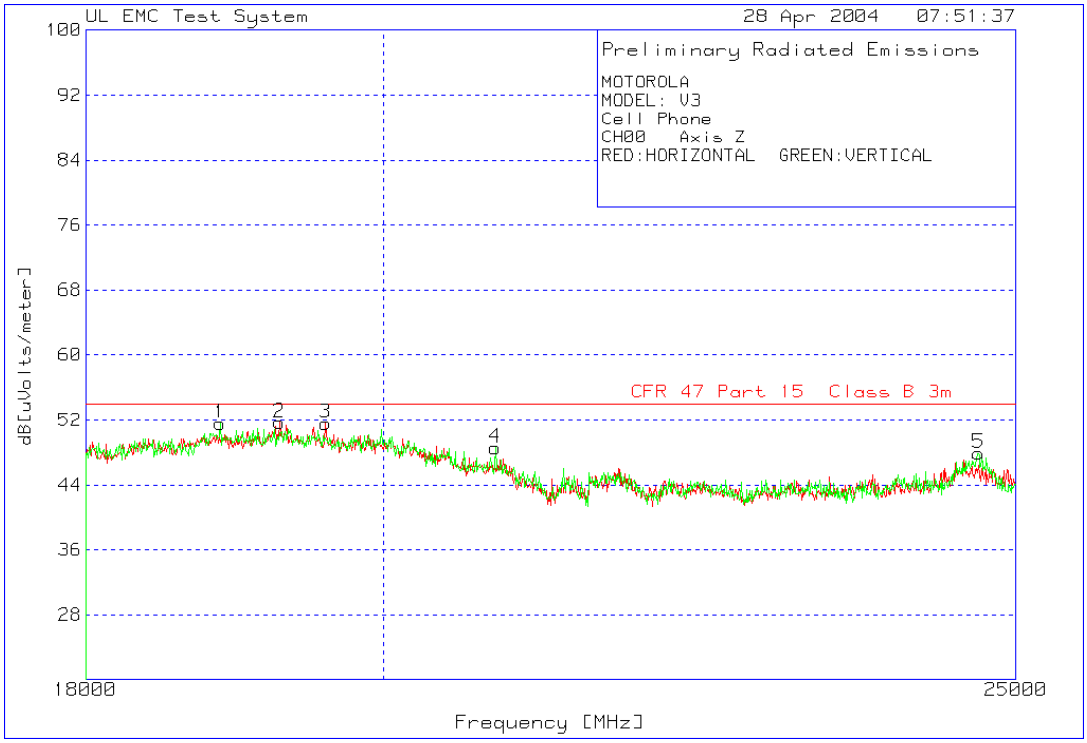


18-25GHz Low-Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	18812.813	71.79 pk	-60.5	40.1	51.39	54
	Height:150 Horz		**Margin [dB]**		**-2.61**	
2	19240.24	71.93 pk	-60.7	40.3	51.53	54
	Height:101 Horz		**Margin [dB]**		**-2.47**	
3	19394.394	72.34 pk	-60.6	40.3	52.04	54
	Height:150 Horz		**Margin [dB]**		**-1.96**	
4	19800.801	71.53 pk	-60.8	40.3	51.03	54
	Height:101 Horz		**Margin [dB]**		**-2.97**	
Vertical 18000 - 25000MHz						
5	24670.671	66.34 pk	-58.8	40.3	47.84	54
	Height:101 Vert		**Margin [dB]**		**-6.16**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

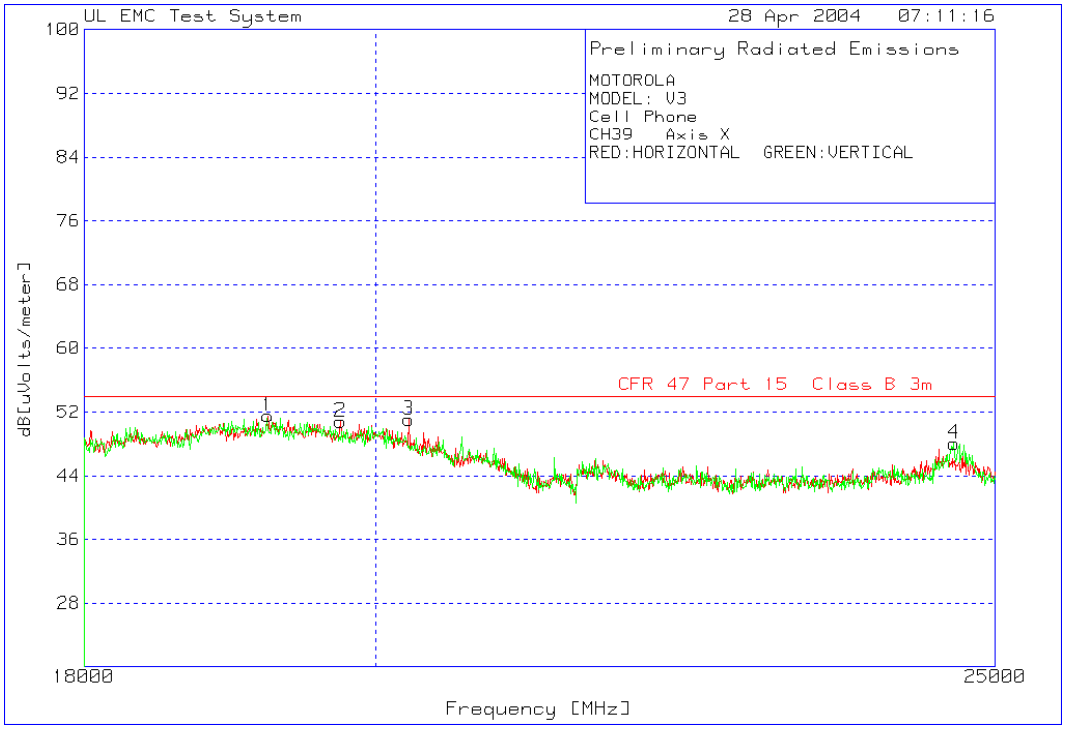


18-25GHz Low-Channel Z-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH00 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
2	19275.275	72.09 pk	-60.7	40.3	51.69	54
	Height:150 Horz	**Margin [dB]**	**-2.31**			
3	19590.591	72.3 pk	-61	40.3	51.6	54
	Height:101 Horz	**Margin [dB]**	**-2.4**			
Vertical 18000 - 25000MHz						
1	18875.876	71.81 pk	-60.4	40.2	51.61	54
	Height:150 Vert	**Margin [dB]**	**-2.39**			
4	20802.803	68.99 pk	-60.6	40.2	48.59	54
	Height:101 Vert	**Margin [dB]**	**-5.41**			
5	24670.671	66.39 pk	-58.8	40.3	47.89	54
	Height:150 Vert	**Margin [dB]**	**-6.11**			

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

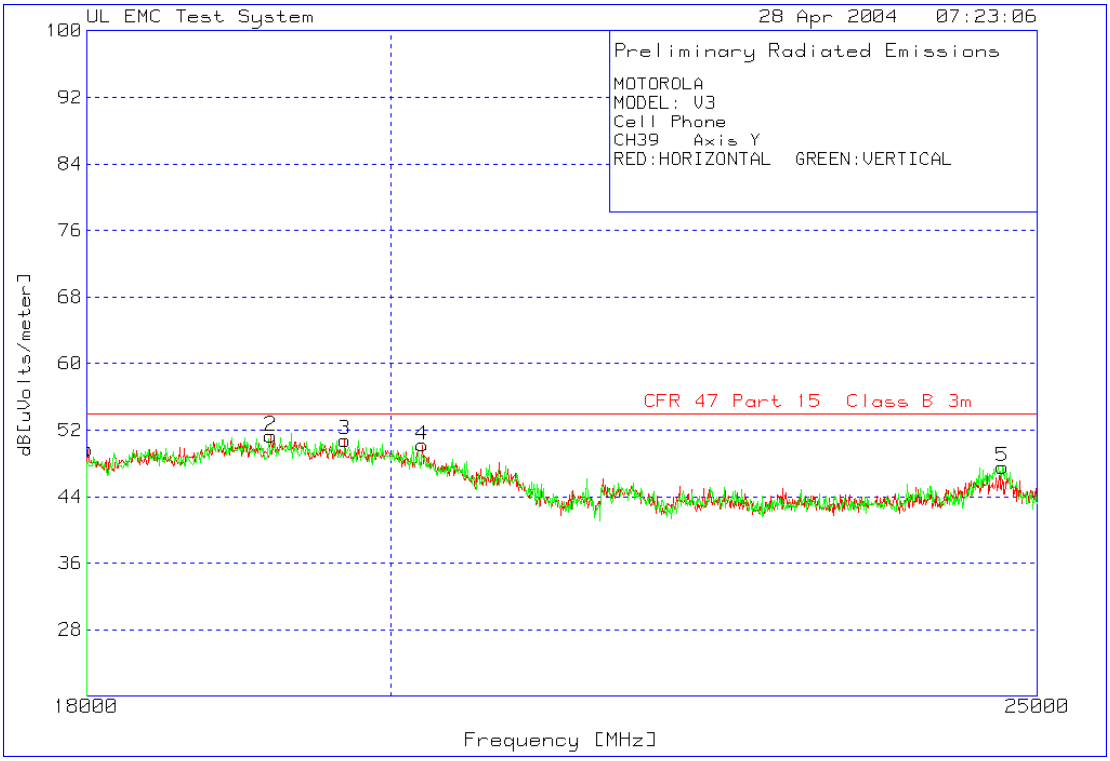


18-25GHz Mid-Channel X-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	19233.233	72 pk	-60.8	40.3	51.5	54
	Height:150 Horz	**Margin [dB]**	**-2.5**			
2	19744.745	71.4 pk	-60.9	40.3	50.8	54
	Height:101 Horz	**Margin [dB]**	**-3.2**			
3	20235.235	72.07 pk	-61.2	40.2	51.07	54
	Height:150 Horz	**Margin [dB]**	**-2.93**			
Vertical 18000 - 25000MHz						
4	24628.629	66.77 pk	-59	40.3	48.07	54
	Height:150 Vert	**Margin [dB]**	**-5.93**			

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

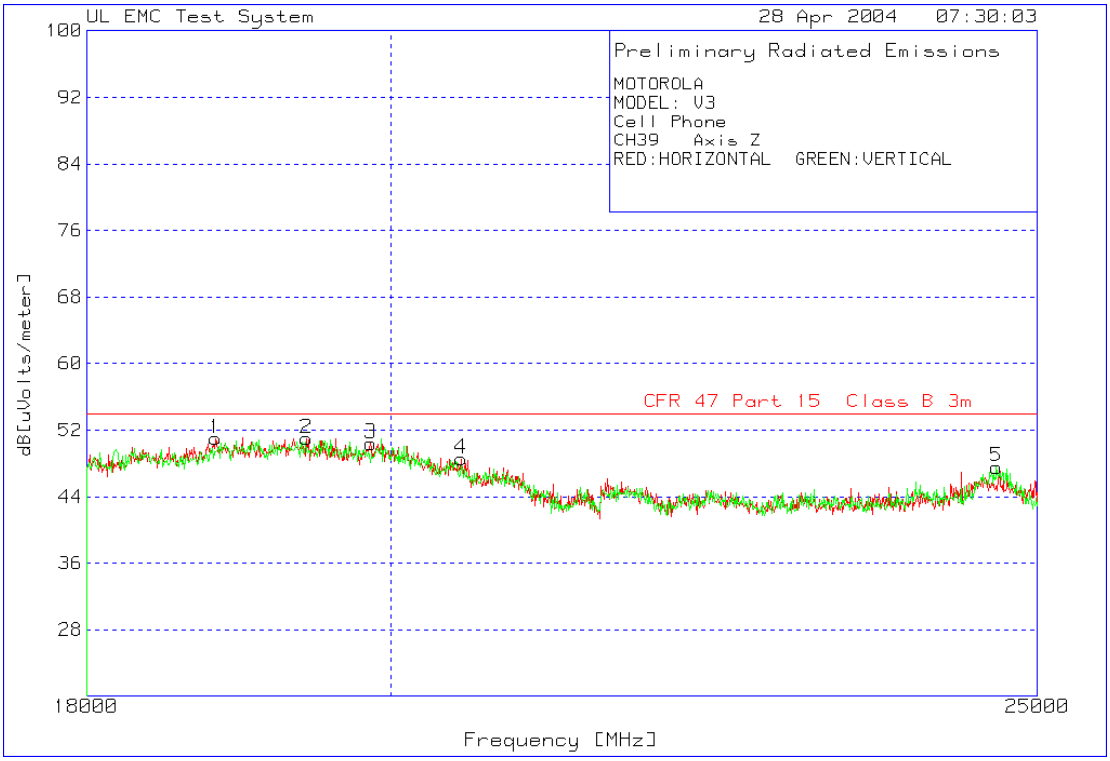


18-25GHz Mid-Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	18007.007	70.31 pk	-60.6	40	49.71	54
		Height:150 Horz	**Margin [dB]**	**-4.29**		
2	19184.184	71.88 pk	-60.9	40.3	51.28	54
		Height:150 Horz	**Margin [dB]**	**-2.72**		
3	19681.682	71.62 pk	-61.1	40.3	50.82	54
		Height:150 Horz	**Margin [dB]**	**-3.18**		
4	20214.214	71.21 pk	-61.2	40.2	50.21	54
		Height:150 Horz	**Margin [dB]**	**-3.79**		
Vertical 18000 - 25000MHz						
5	24698.699	65.88 pk	-58.6	40.3	47.58	54
		Height:150 Vert	**Margin [dB]**	**-6.42**		

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

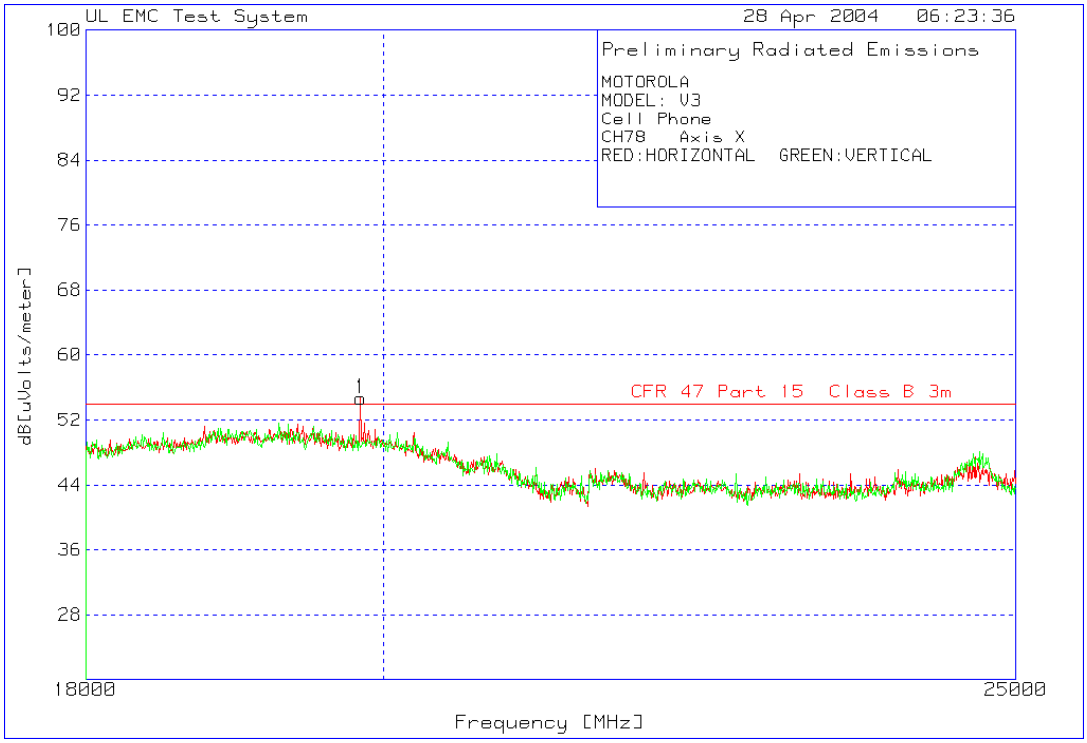


18-25GHz Mid-Channel Z-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH39 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	18819.82	71.38 pk	-60.5	40.1	50.98	54
		Height:101 Horz	**Margin [dB]**	**-3.02**		
2	19422.422	71.37 pk	-60.7	40.3	50.97	54
		Height:150 Horz	**Margin [dB]**	**-3.03**		
3	19856.857	71.01 pk	-60.9	40.3	50.41	54
		Height:101 Horz	**Margin [dB]**	**-3.59**		
4	20487.487	69.54 pk	-61.3	40.3	48.54	54
		Height:101 Horz	**Margin [dB]**	**-5.46**		
Vertical 18000 - 25000MHz						
5	24649.65	66.18 pk	-58.9	40.3	47.58	54
		Height:150 Vert	**Margin [dB]**	**-6.42**		

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



18-25GHz High-Channel X-Orientation

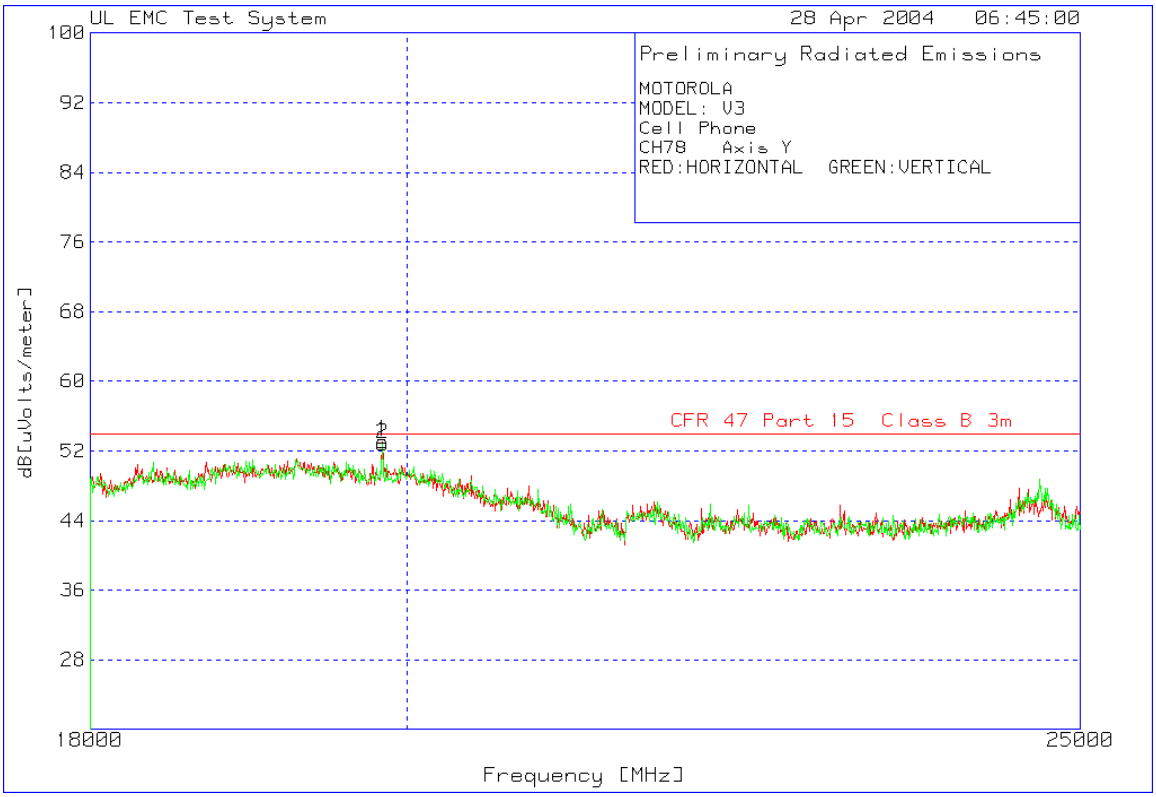
MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis X
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transduce Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	19835.836	75.29 pk	-60.9	40.3	54.69	54
Height:101 Horz				**Margin[dB**	**0.69**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

The duty cycle correction factor was applied to over limit signals:

Frequency (MHz)	Level (dBuV)	Duty Cycle Correction Factor	Corrected Level	Limit	Corrected Margin
19835.836	54.69	-30.66	24.03	54	**-29.97**

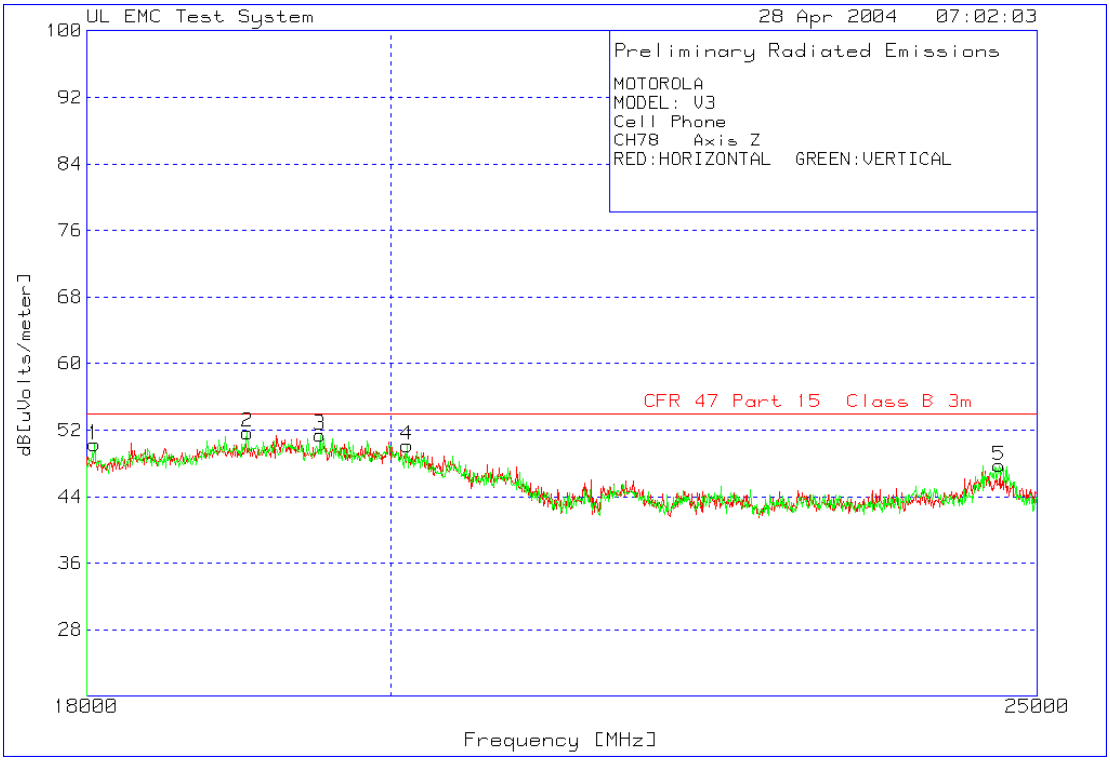


18-25GHz High-Channel Y-Orientation

MOTOROLA
MODEL: V3
Cell Phone
CH78 Axis Y
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Horizontal 18000 - 25000MHz						
1	19835.836	73.69 pk	-60.9	40.3	53.09	54
		Height:101 Horz	**Margin [dB]**	**-.91**		
Vertical 18000 - 25000MHz						
2	19835.836	73.38 pk	-60.9	40.3	52.78	54
		Height:150 Vert	**Margin [dB]**	**-1.22**		

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



18-25GHz High-Channel Z-Orientation

MODEL: V3
Cell Phone
CH78 Axis Z
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1
Vertical 18000-25000MHz						
1	18049.049	70.77 pk	-60.5	40	50.27	54
		Height:150 Vert		**Margin[dB]**	**-3.73**	
2	19030.03	72.24 pk	-60.7	40.2	51.74	54
		Height:101 Vert		**Margin[dB]**	**-2.26**	
3	19513.514	72 pk	-60.9	40.3	51.4	54
		Height:101 Vert		**Margin[dB]**	**-2.6**	
4	20109.109	71.08 pk	-61.1	40.2	50.18	54
		Height:101 Vert		**Margin[dB]**	**-3.82**	
5	24670.671	66.23 pk	-58.8	40.3	47.73	54
		Height:101 Vert		**Margin[dB]**	**-6.27**	

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

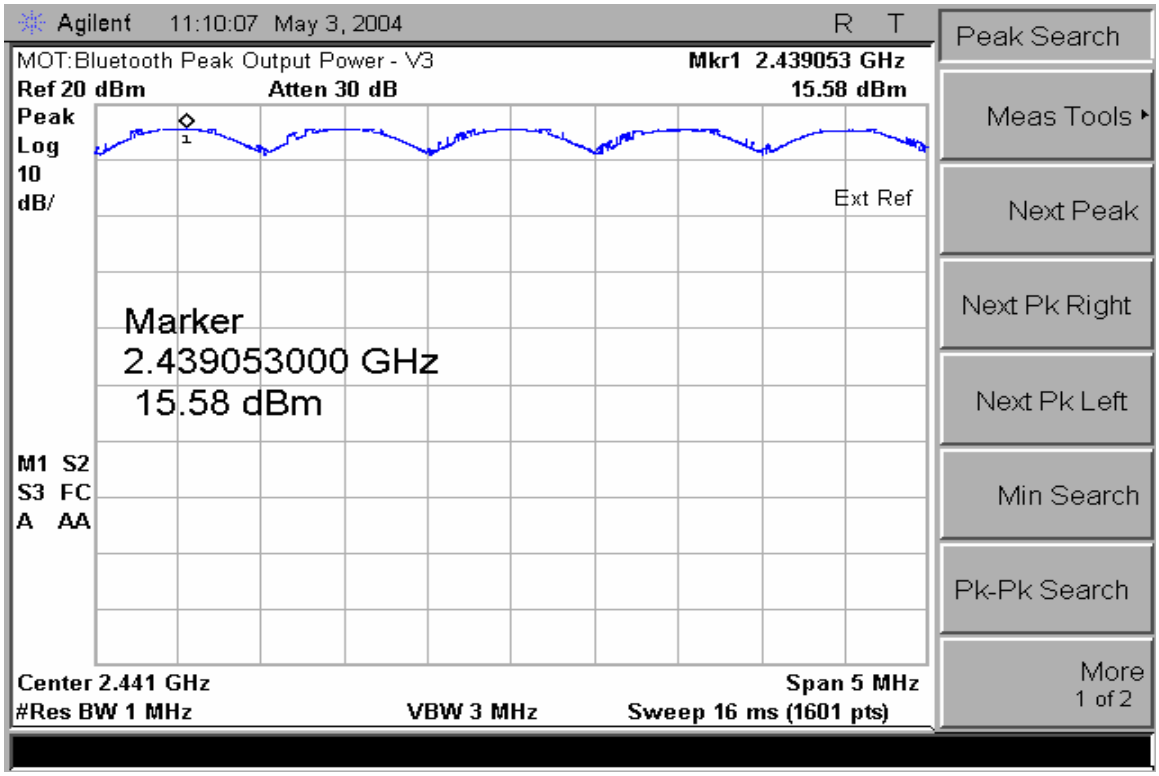
PEAK OUTPUT POWER

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results



Peak Output Power

BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS

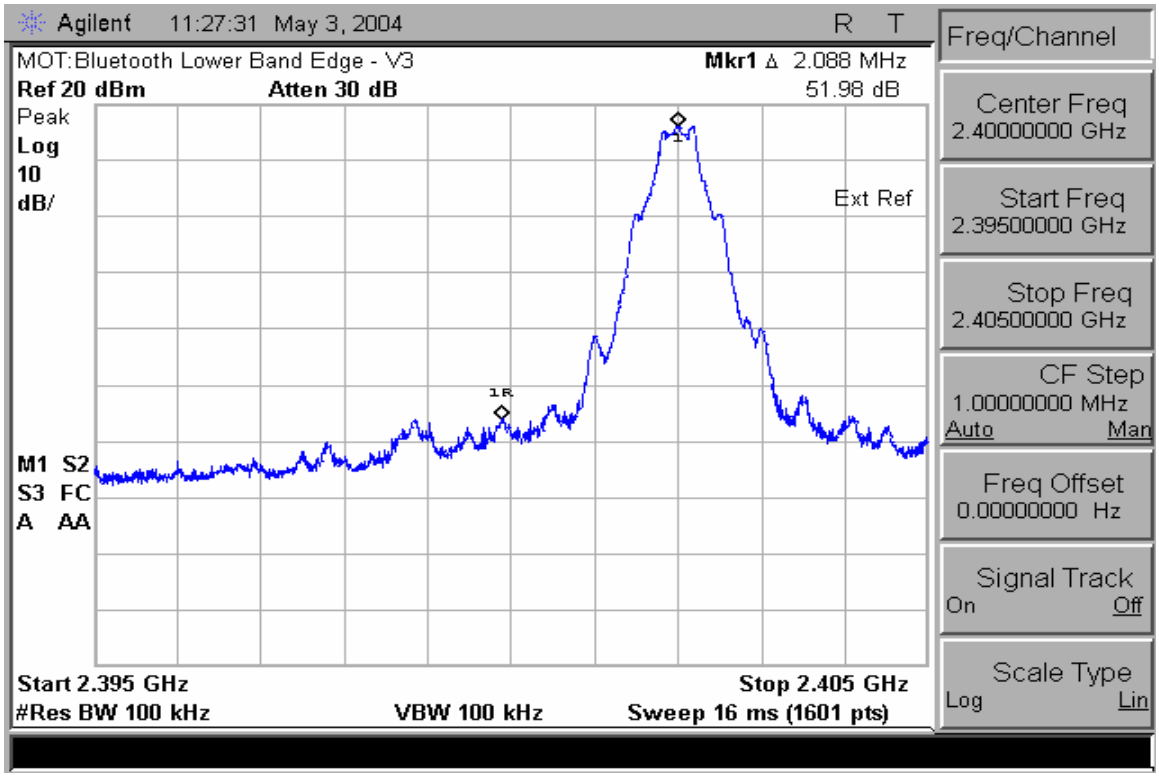
CFR 47 Part 15.247

Measurement Procedure

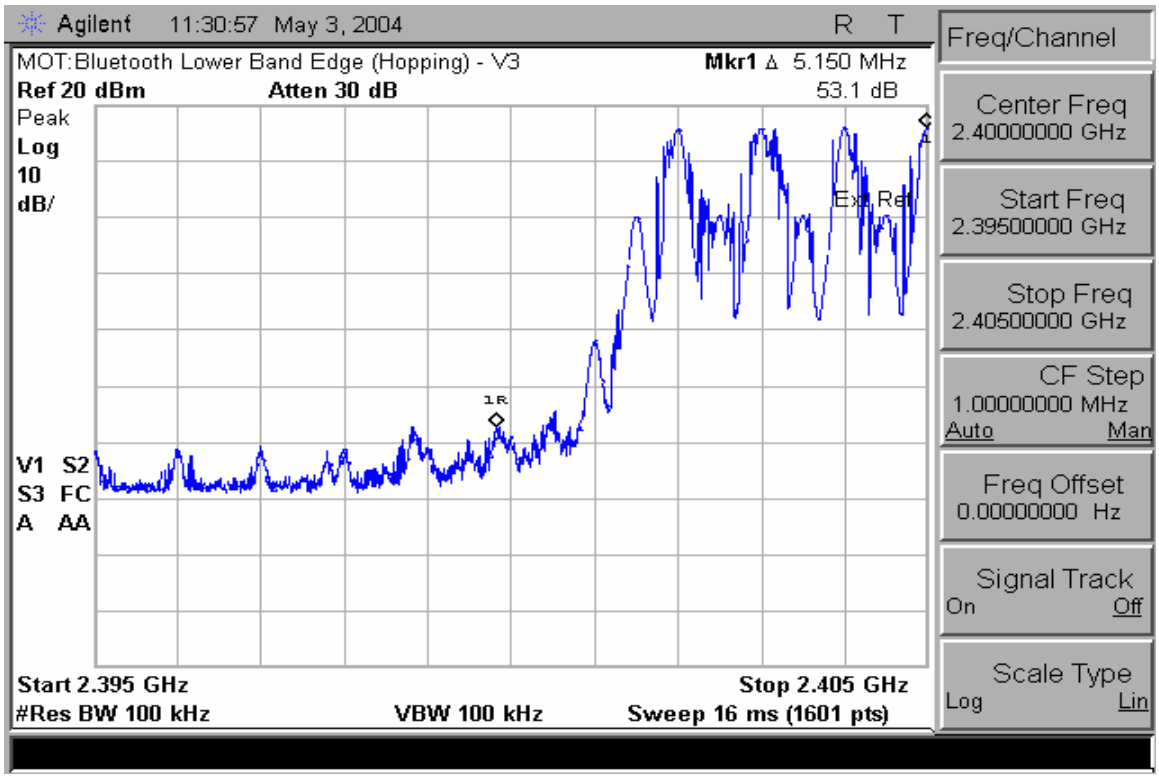
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

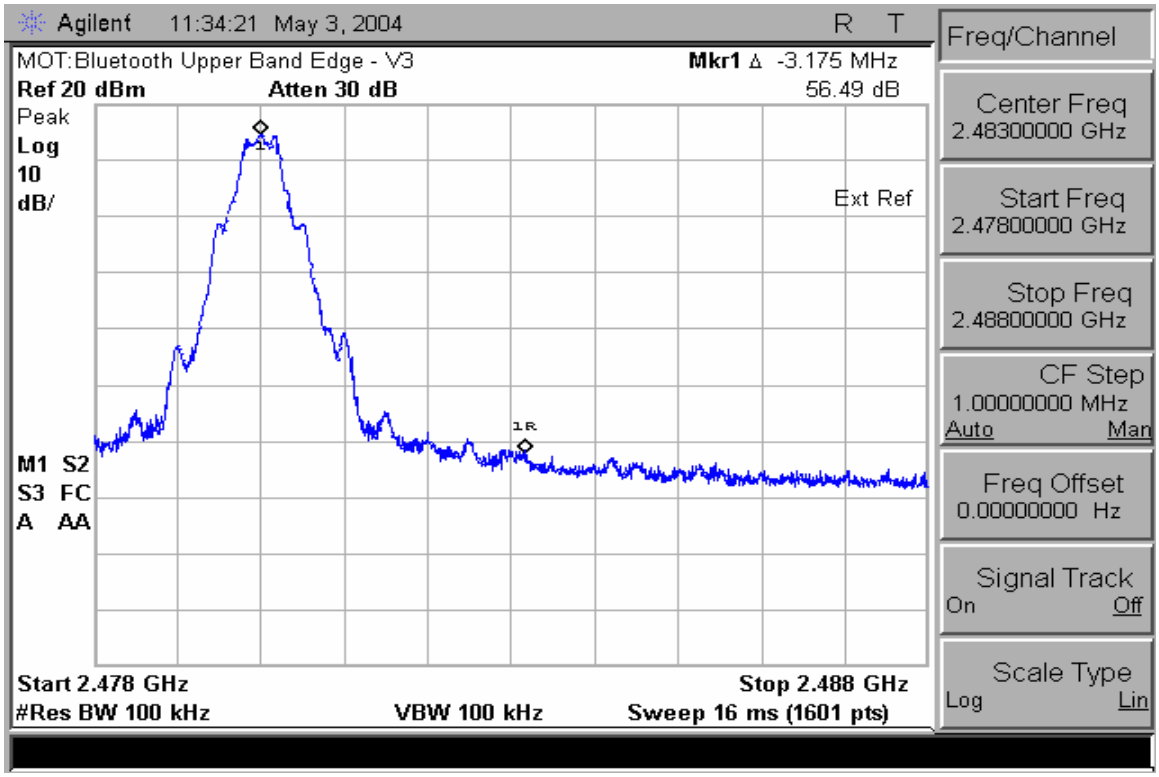
See Attached:



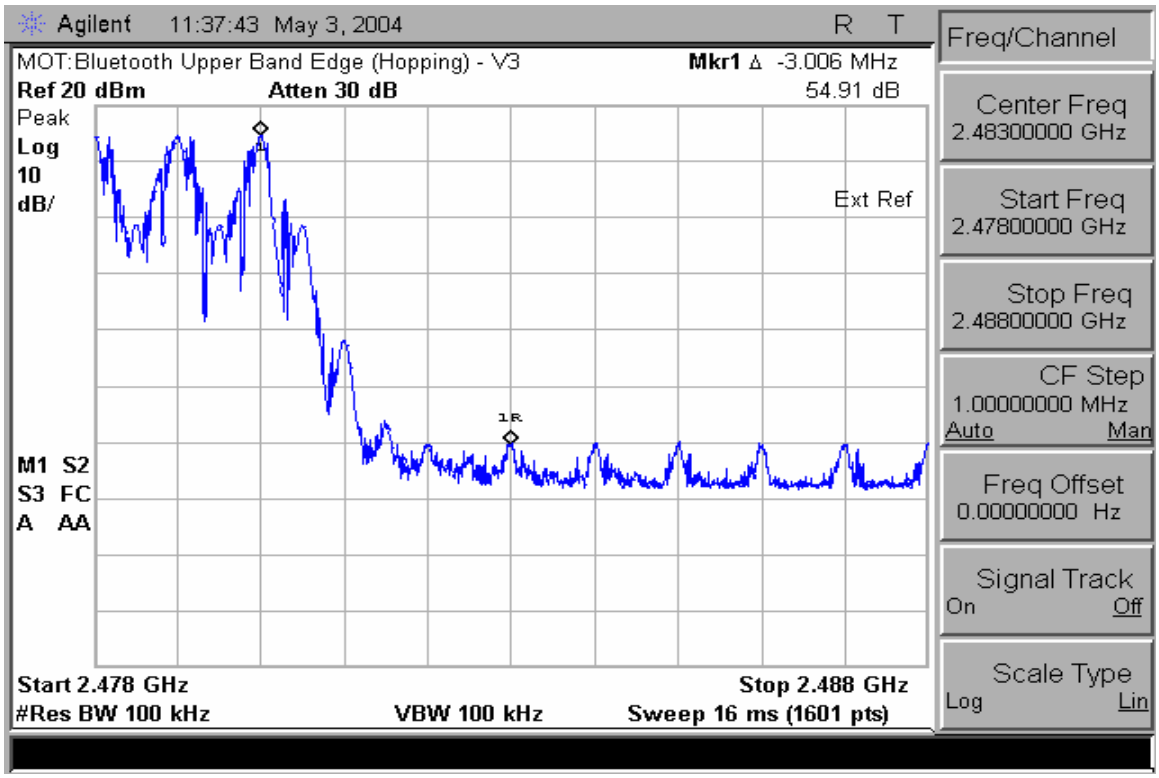
Low Band Edge with Hopping Disabled



Low Band Edge with Hopping Enabled



High Band Edge with Hopping Disabled



High Band Edge with Hopping Enabled

SPURIOUS RF CONDUCTED EMISSIONS

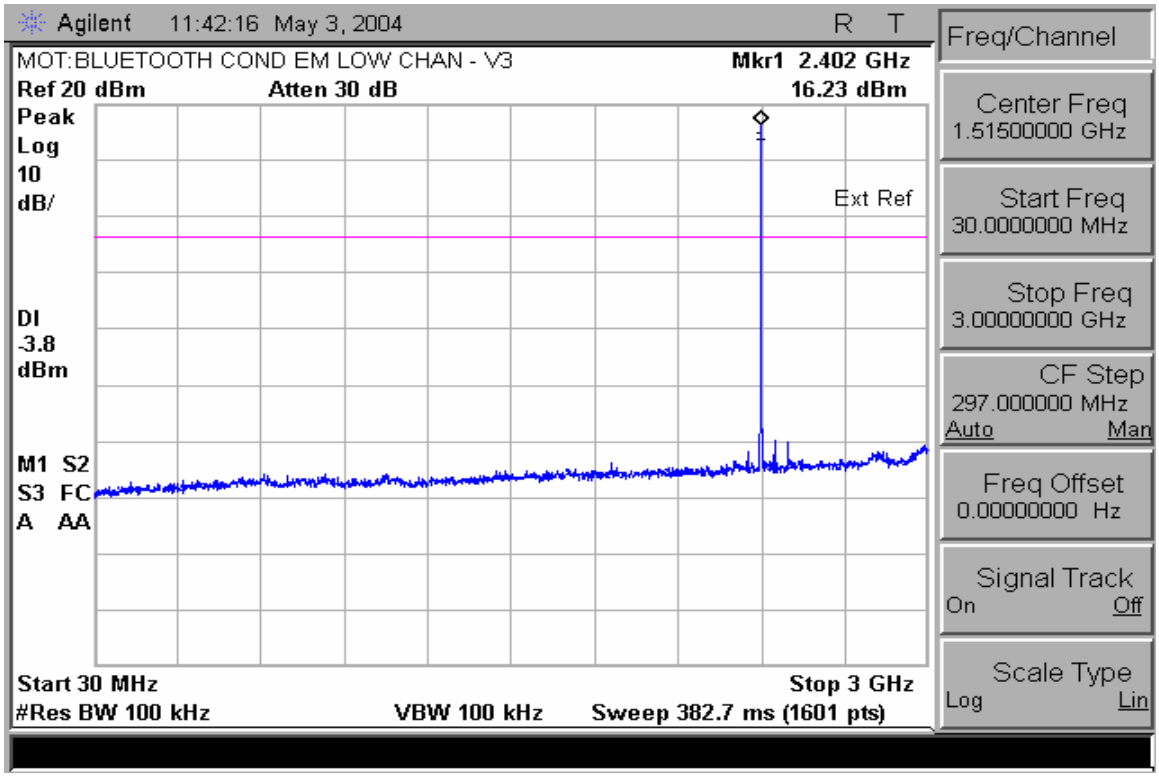
CFR 47 Part 15.247

Measurement Procedure

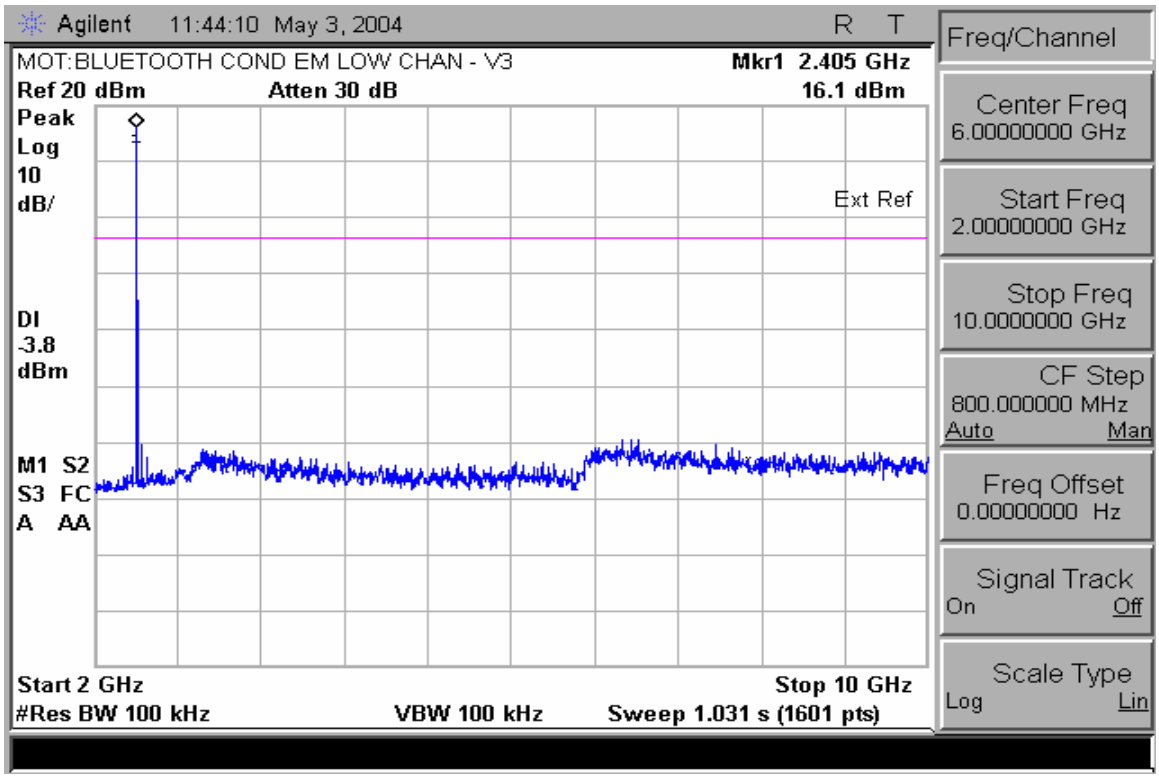
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

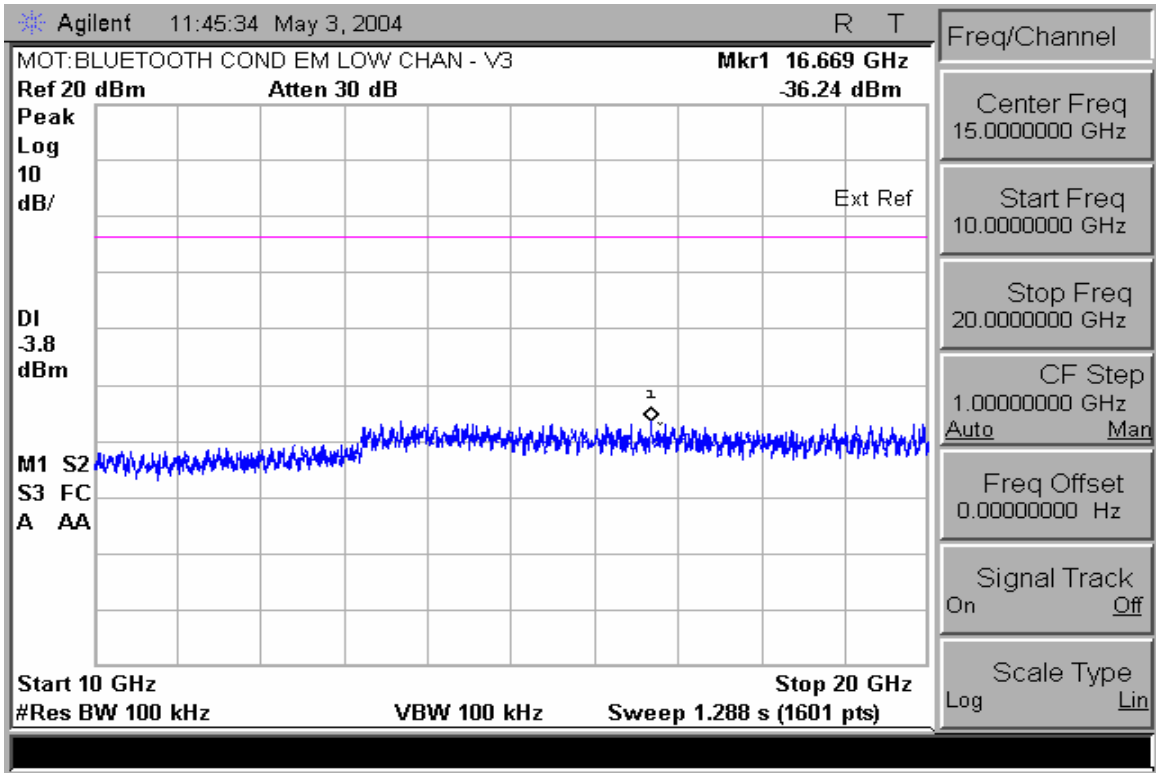
See attached:



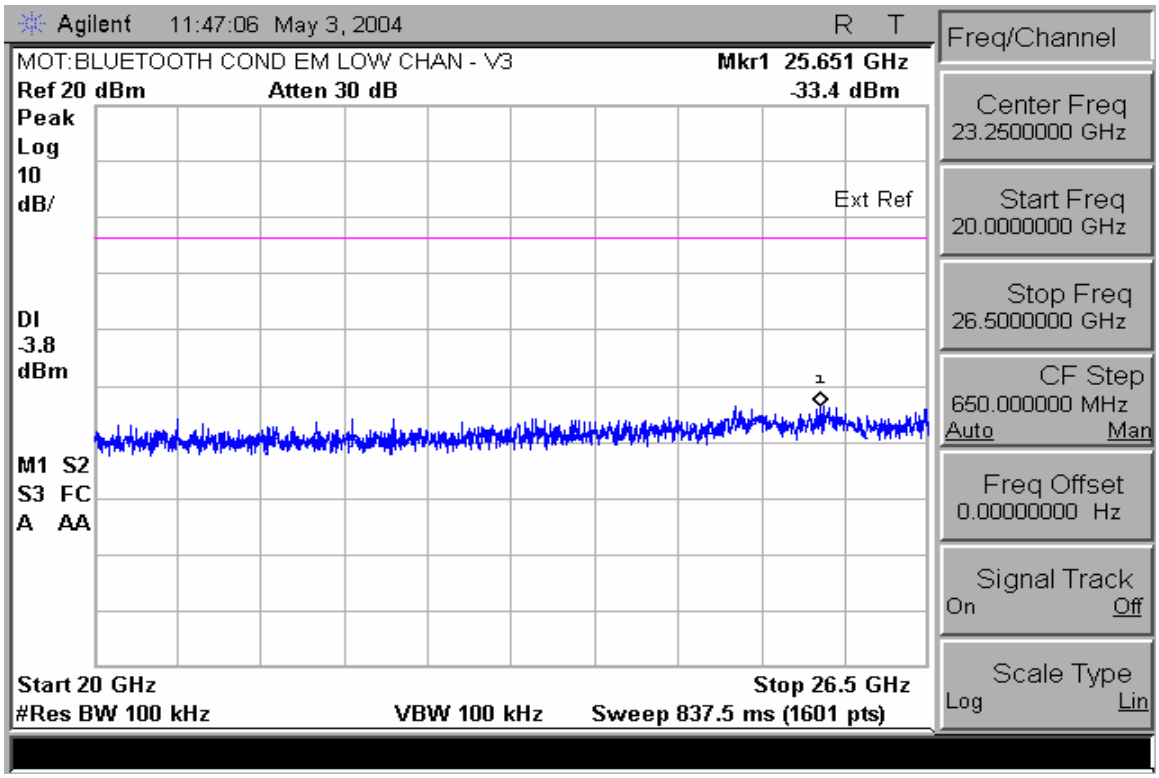
Conducted Spurious Emissions 30-3000MHz (Low Channel Enabled)



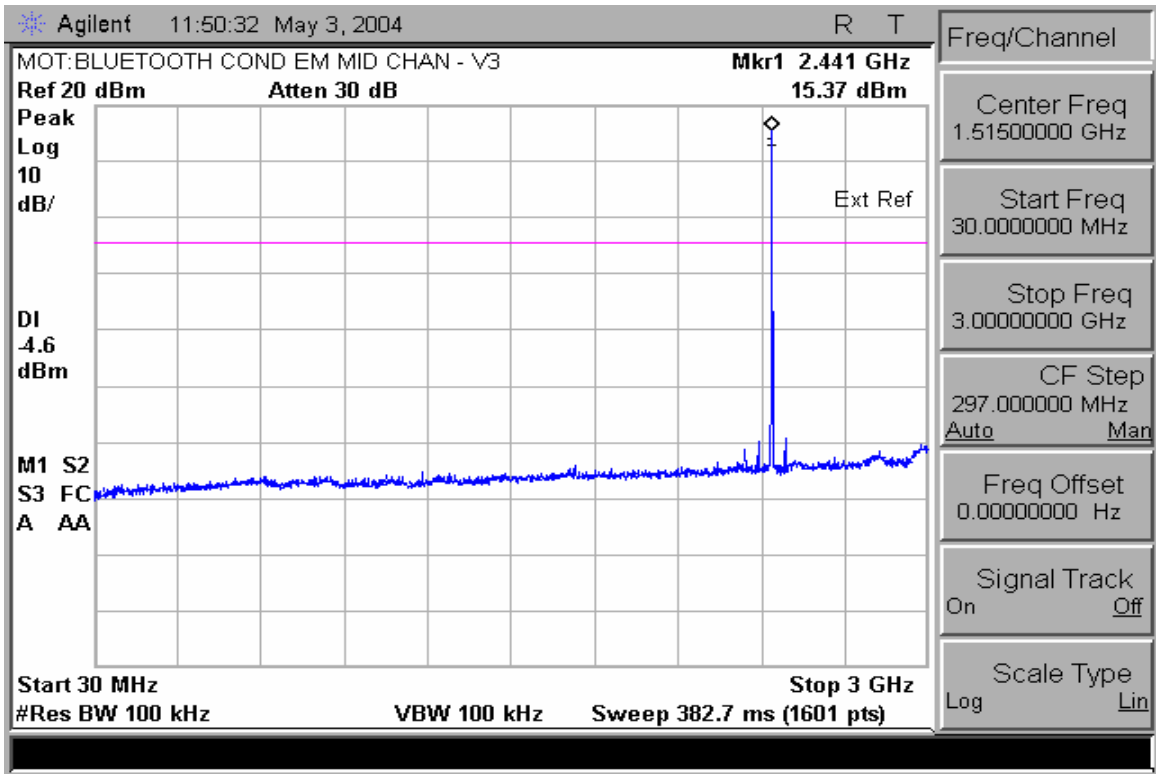
Conducted Spurious Emissions 2-10GHz (Low Channel Enabled)



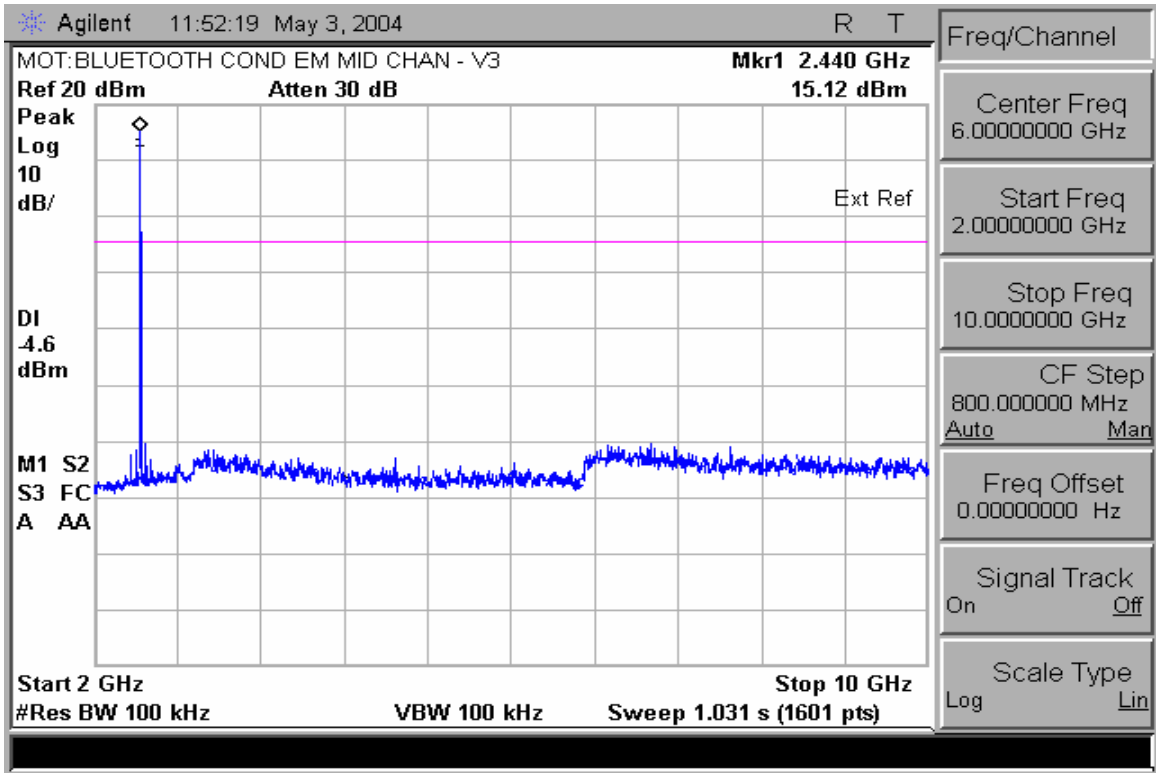
Conducted Spurious Emissions 10-20GHz (Low Channel Enabled)



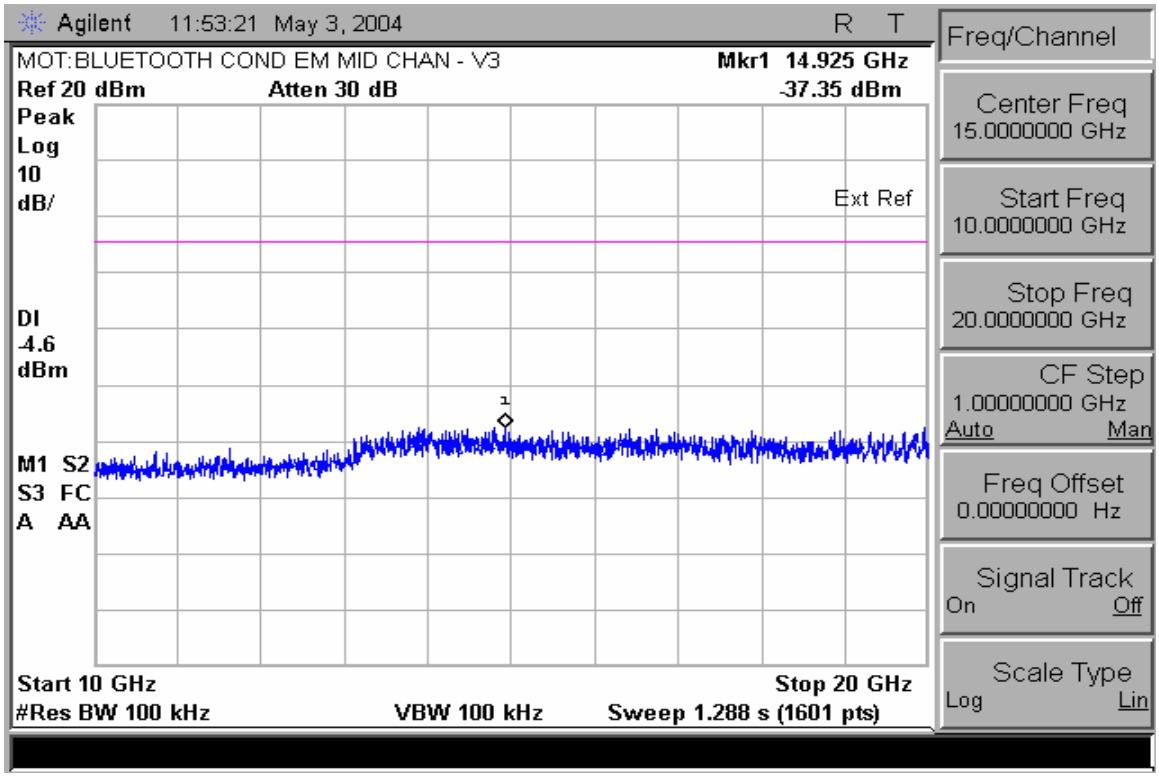
Conducted Spurious Emissions 20-26.5GHz (Low Channel Enabled)



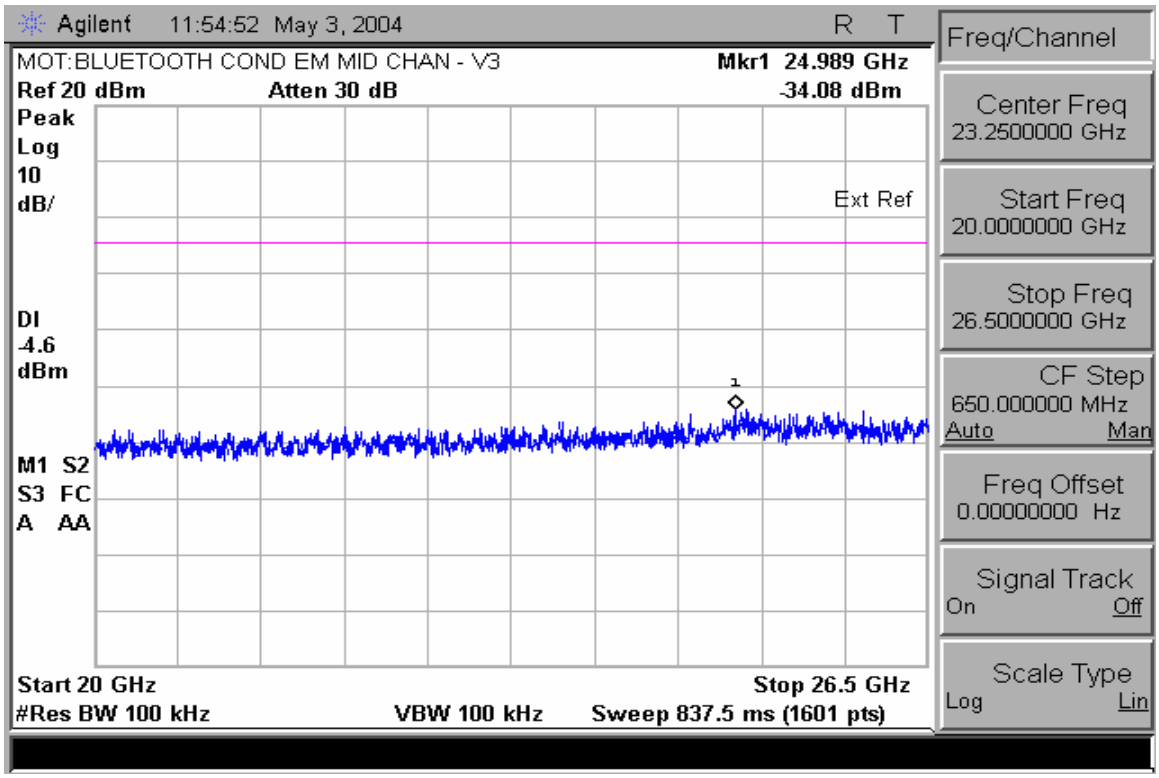
Conducted Spurious Emissions 30-3000MHz (Mid Channel Enabled)



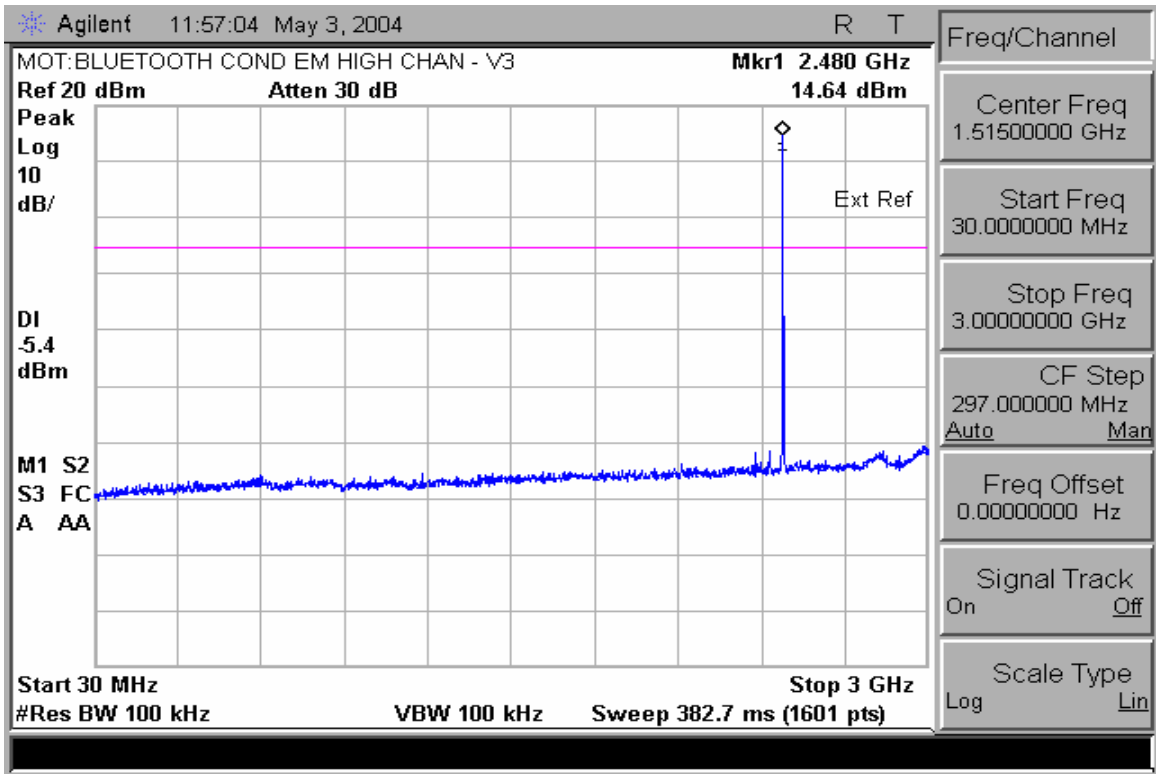
Conducted Spurious Emissions 2-10GHz (Mid Channel Enabled)



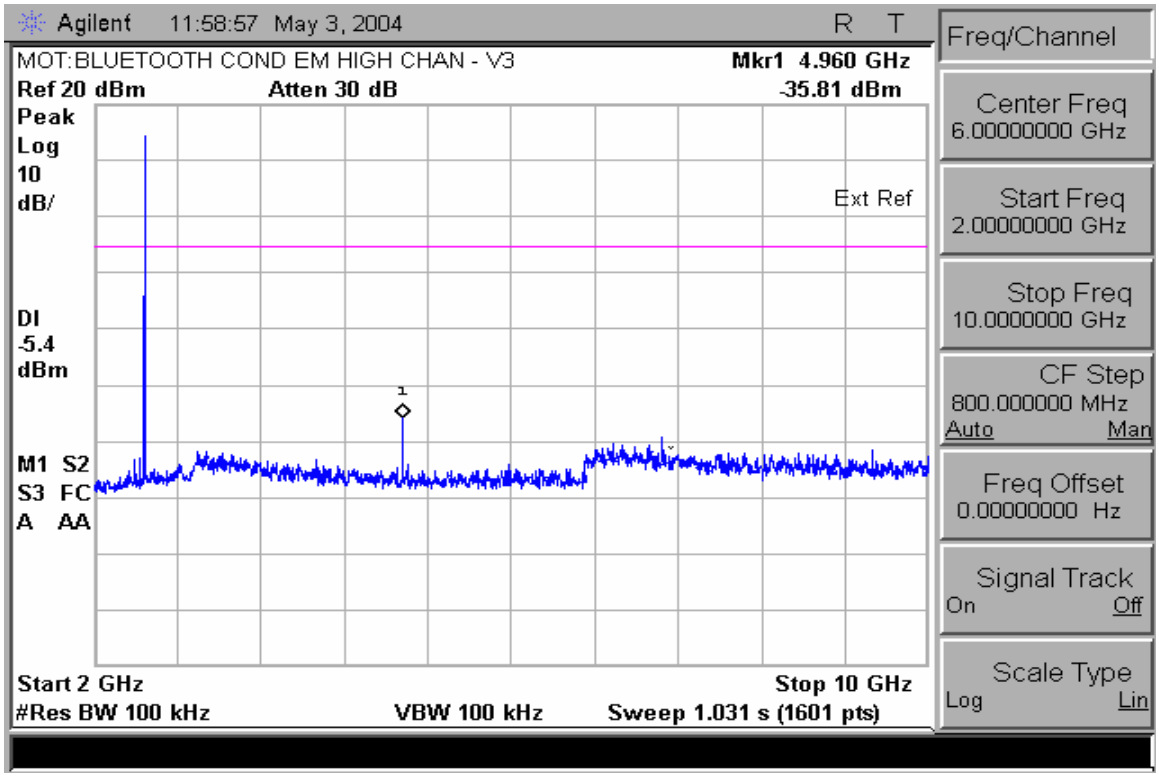
Conducted Spurious Emissions 10-20GHz (Mid Channel Enabled)



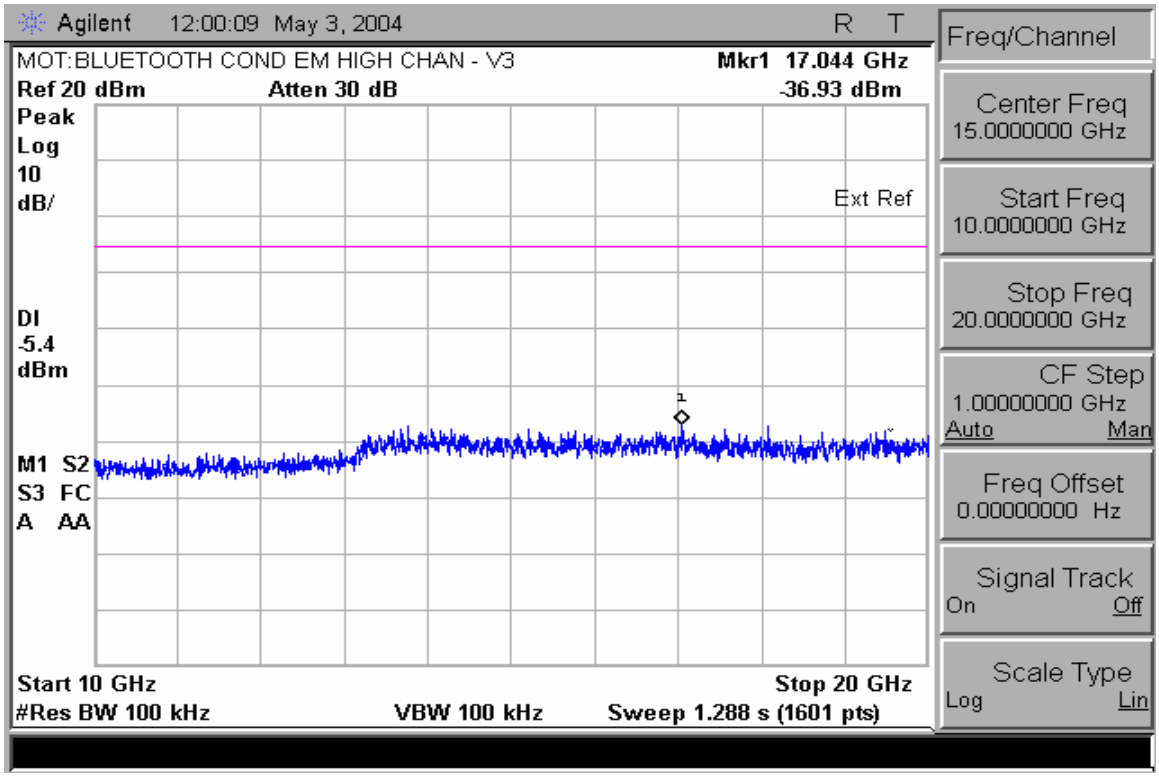
Conducted Spurious Emissions 20-26.5GHz (Mid Chan Enabled)



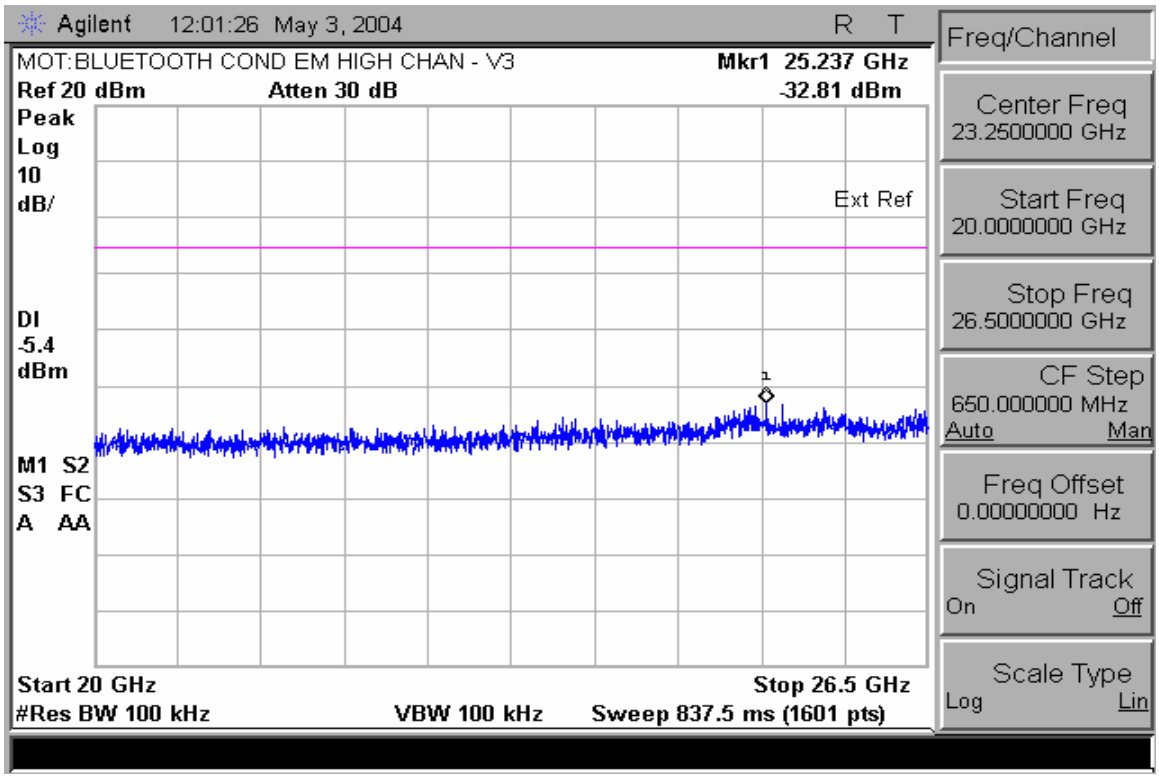
Conducted Spurious Emissions 30-3000MHz (High Channel Enabled)



Conducted Spurious Emissions 2-10GHz (High Channel Enabled)



Conducted Spurious Emissions 10-20GHz (High Channel Enabled)



Conducted Spurious Emissions 20-26.5GHz (High Chan Enabled)

End of Test Report