



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT - Addendum

Test Report Number – 16784-1BT

Report Date – October-11-2005

Revision 2

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.

A handwritten signature in cursive script that reads 'Mark Sidlow'.

Signature:

Name: Mark Sidlow

Title: Senior Electrical Engineer

Date : 2005-11-10

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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, Bluetooth

Model Number: V3x

Serial Numbers: LSR0640027, LSR0640025
& LSR0640037

Testing Complete Date: October 7, 2005

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:

- ☒ 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	Result
2	Number of Hopping Frequencies	Result
3	Time of Occupancy (Dwell Time)	Result
4	20 dB Bandwidth	Result
5	Spurious RF Conducted Emissions	Result
6	Field Strength of Spurious Emissions	Result
7	Max Power	N/A
8	Band Edges	See plots
9	Conducted Spurious Emissions	Result

Test	Test Name	Results
1	Carrier Frequency Separation	1 MHz
2	Number of Hopping	79
3	Time of Occupancy (Dwell Time)	2.92 ms
4	20 dB Bandwidth	878 kHz
5	Spurious RF Conducted Emissions	See plots
6	Field Strength of Spurious Emissions	See plots
7	Max Power	0.509 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 22° 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

Paste Equipment List Here

Manufacturer	Equipment Type	Model No.	Serial Number	Cal. Due Date
Rohde & Schwarz	Receiver	ESI26	838786/010	2/7/2006
Hewlett-Packard	EMC Analyzer	7405	US39440191	11/13/2005
ETS	DRG Horn Antenna	265	2455	5/25/2006
ETS	DRG Horn Antenna	3115	6222	2/9/2006
ETS	Log-Periodic Antenna	3148	1188	6/14/2006
ETS	Biconical Antenna	3110B	3370	2/16/2006
Attenuator	Weinschel	AS-6	6675	10/14/2005
Attenuator	Weinschel	AS-6	6677	11/4/2005
Rohde & Schwarz	Mobile Test Set	CMD 80	DE29008	N/A
Hewlett-Packard	Signal Generator	83623B	3844A01195	5/23/2006
Thermotron	Environmental Chamber	S-4	31580	1/18/2006
Giga-Tronics	Power Meter	8651A	8650508	12/27/2005

U.L. Equipment

Hewlett Packard	QP Adapter	85650A	2811A01069	1/6/2006
Hewlett Packard	S/A Display	8566B	2542A12974	1/6/2006
Hewlett Packard	S/A	8566B	2637A03376	1/6/2006
Hewlett Packard	RF Preselector	85685A	2810A00692	1/6/2006
Rohde & Schwarz	S/A	FSEK20	DE2525315	3/15/2006
EMCO	Horn Antenna 1-18GHz	3115	2638	7/29/2006
EMCO	Horn Antenna 18-26.5GHz	3160-09	9904-1165	N/A*
Chase	Bi-Con Antenna 30-300MHz	VBA6106A	1246	7/22/2006
Chase	Log-Periodic Antenna	UPA6108	1120	8/2/2006

All equipment is on a one-year calibration cycle.

Description of Bluetooth Transmitter

The V3x 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.

The maximum Bluetooth antenna gain is 1.18 dBi.

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 V3x had its hopping function enabled. The following spectrum analyzer settings were used:

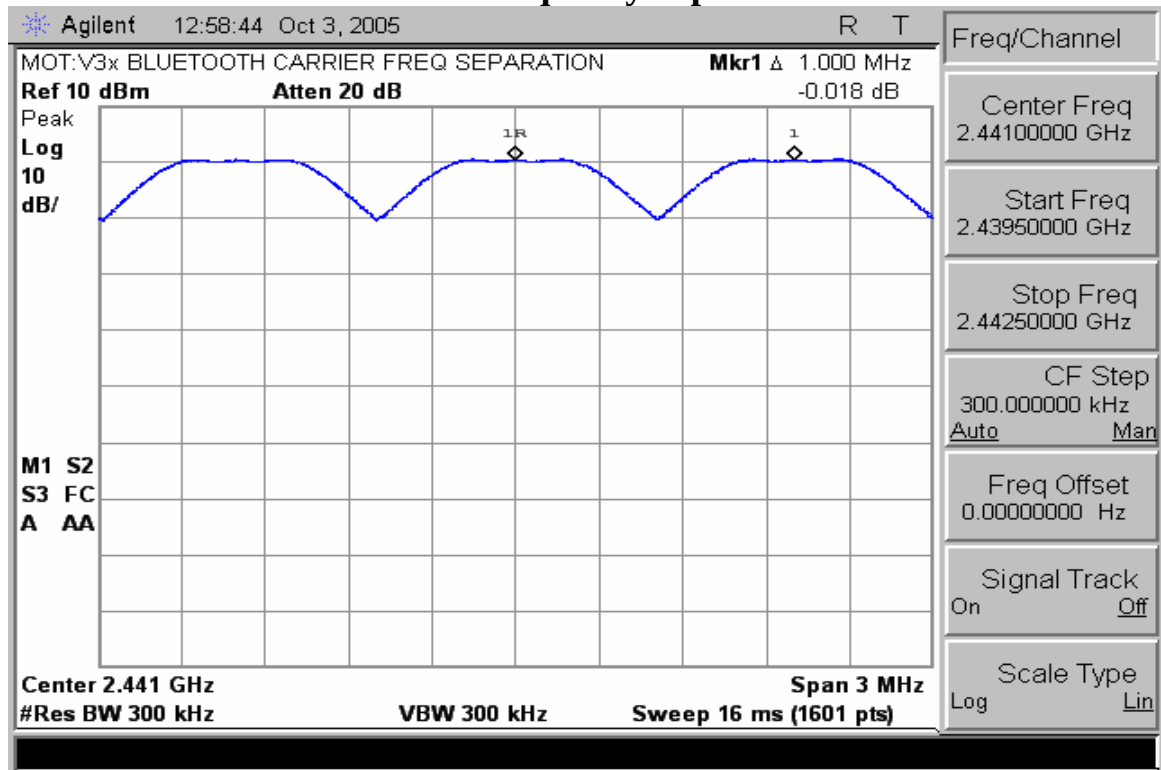
1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW) $\geq$ 1% of the span
3. Video (or Average) Bandwidth (VBW) $\geq$ RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

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.

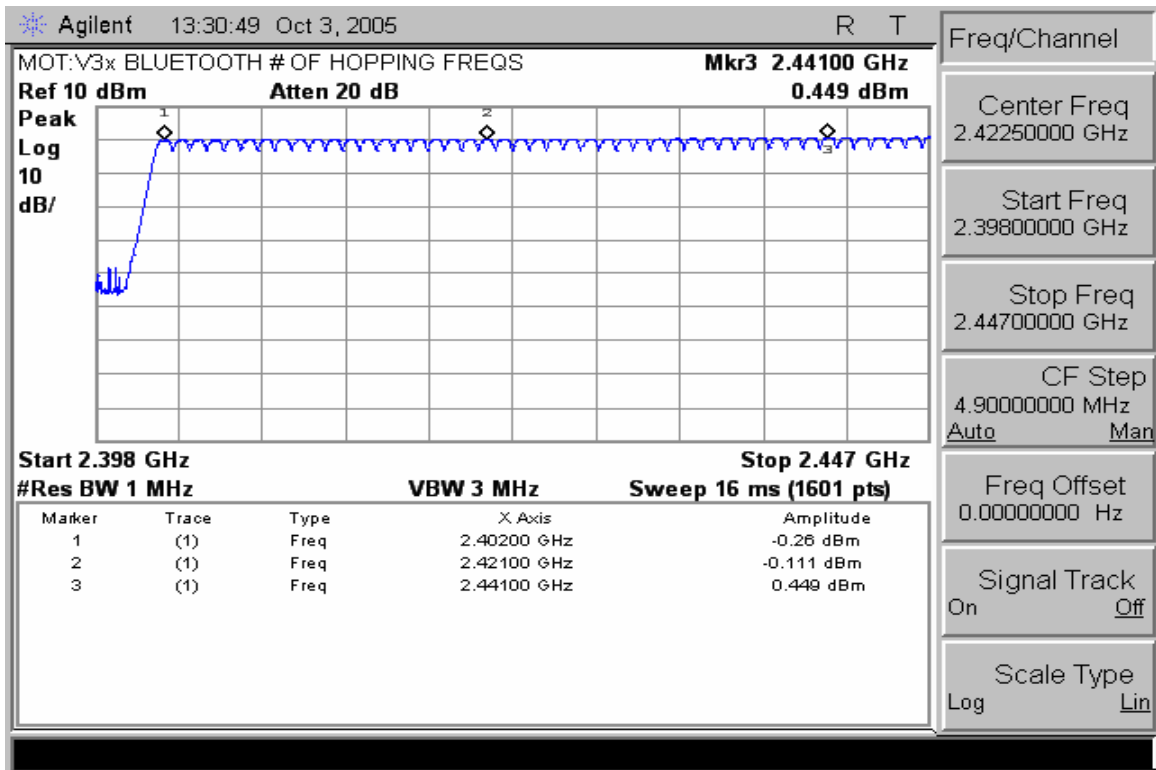
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

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

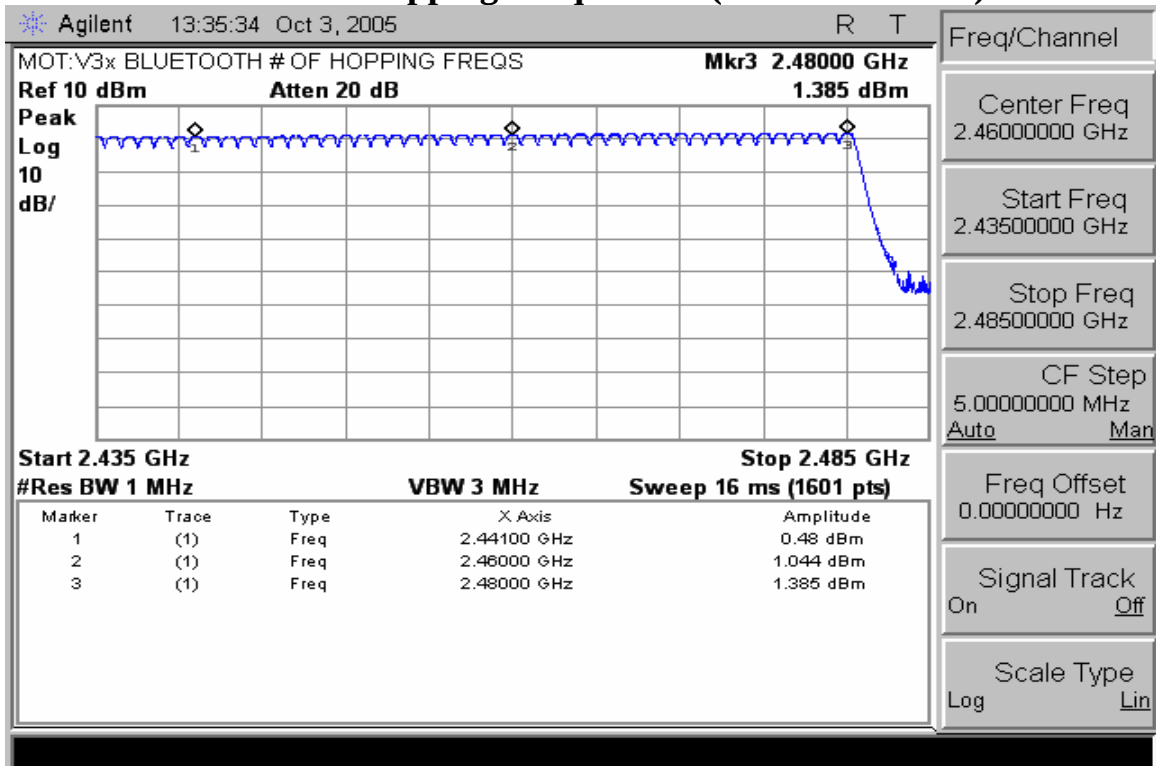
The trace was allowed to stabilize.

Measurement Results

See attached.



Number of Hopping Frequencies (Channels 0 – 39)



Number of Hopping Frequencies (Channels 39 – 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.

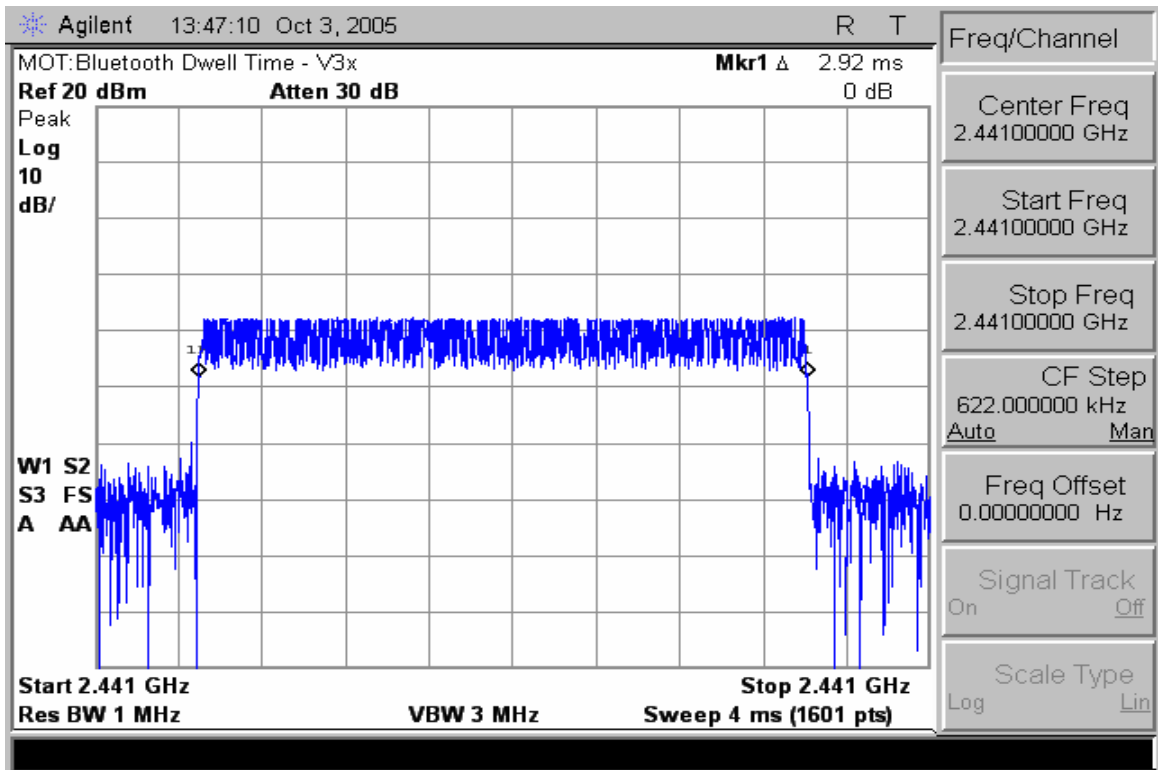
The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW $\geq$ 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

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.

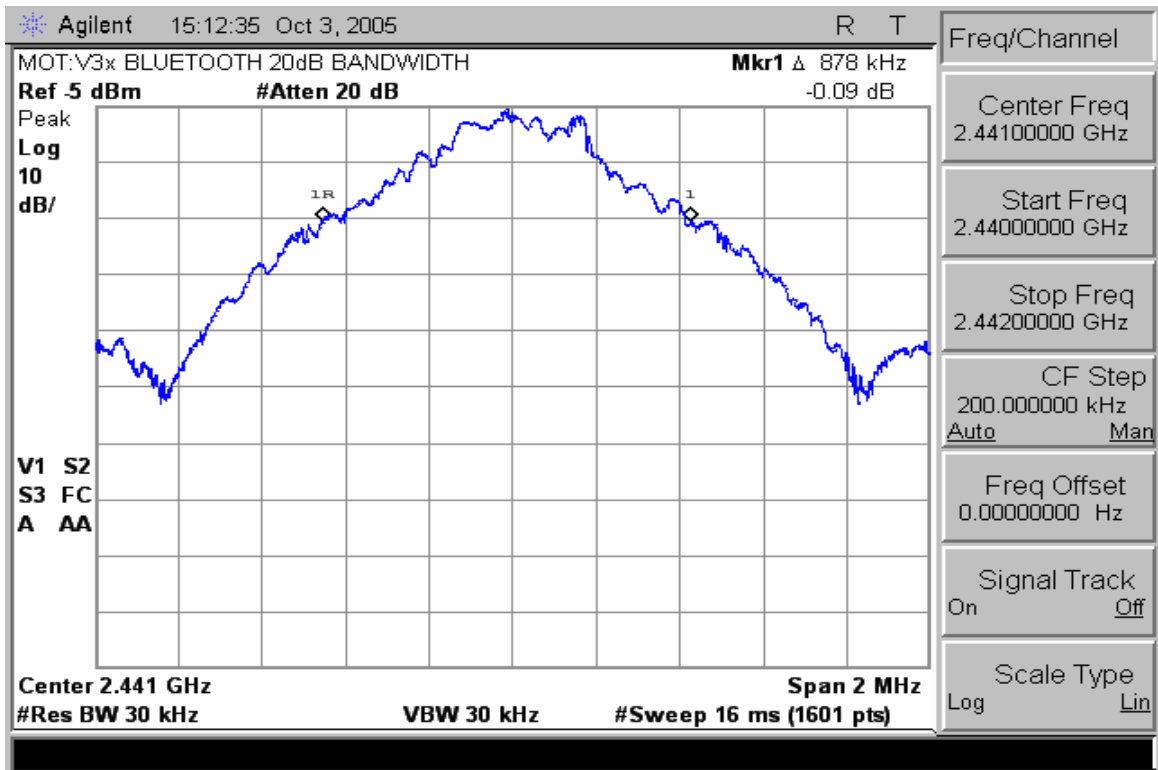
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW $\geq$ 1% of the 20dB span
3. VBW $\geq$ 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



20dB Bandwidth

FIELD STRENGTH OF SPURIOUS EMISSIONS

CFR Part 2.1053, 15.247

Measurement Procedure

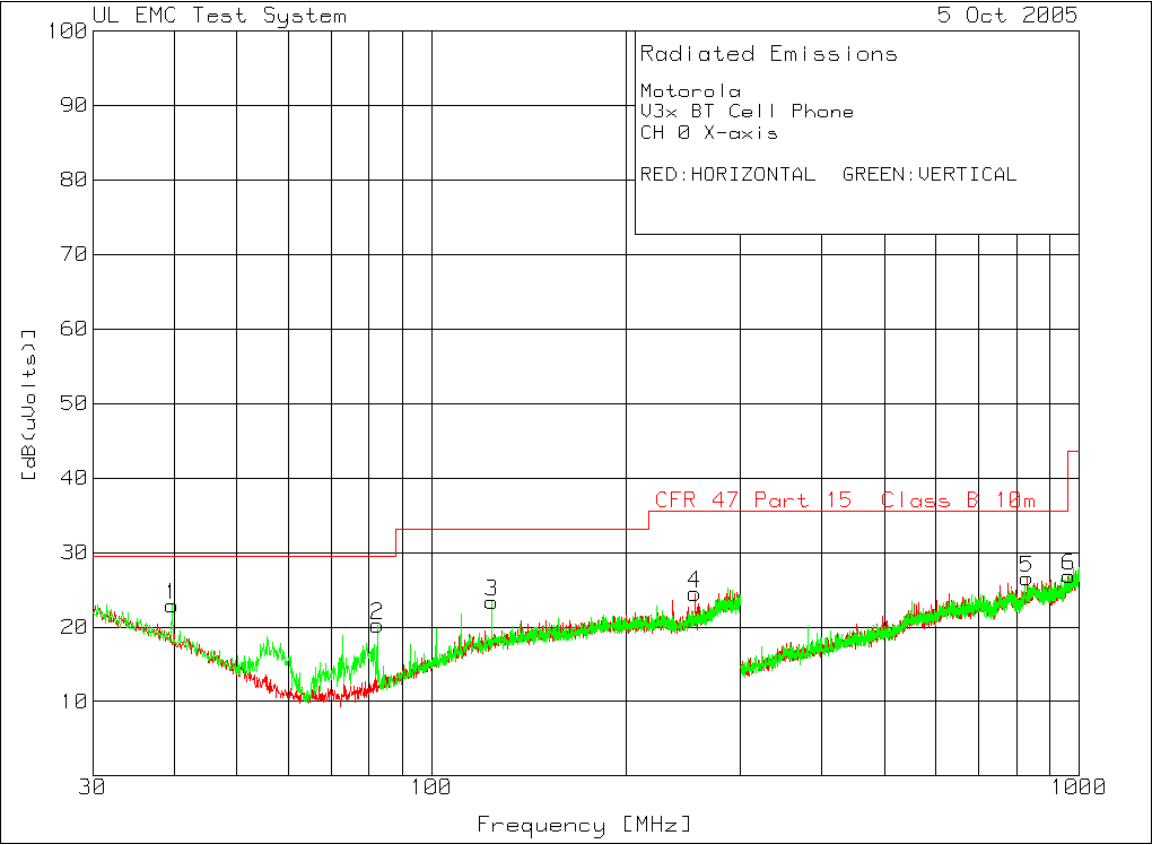
The Equipment-Under-Test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is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

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.

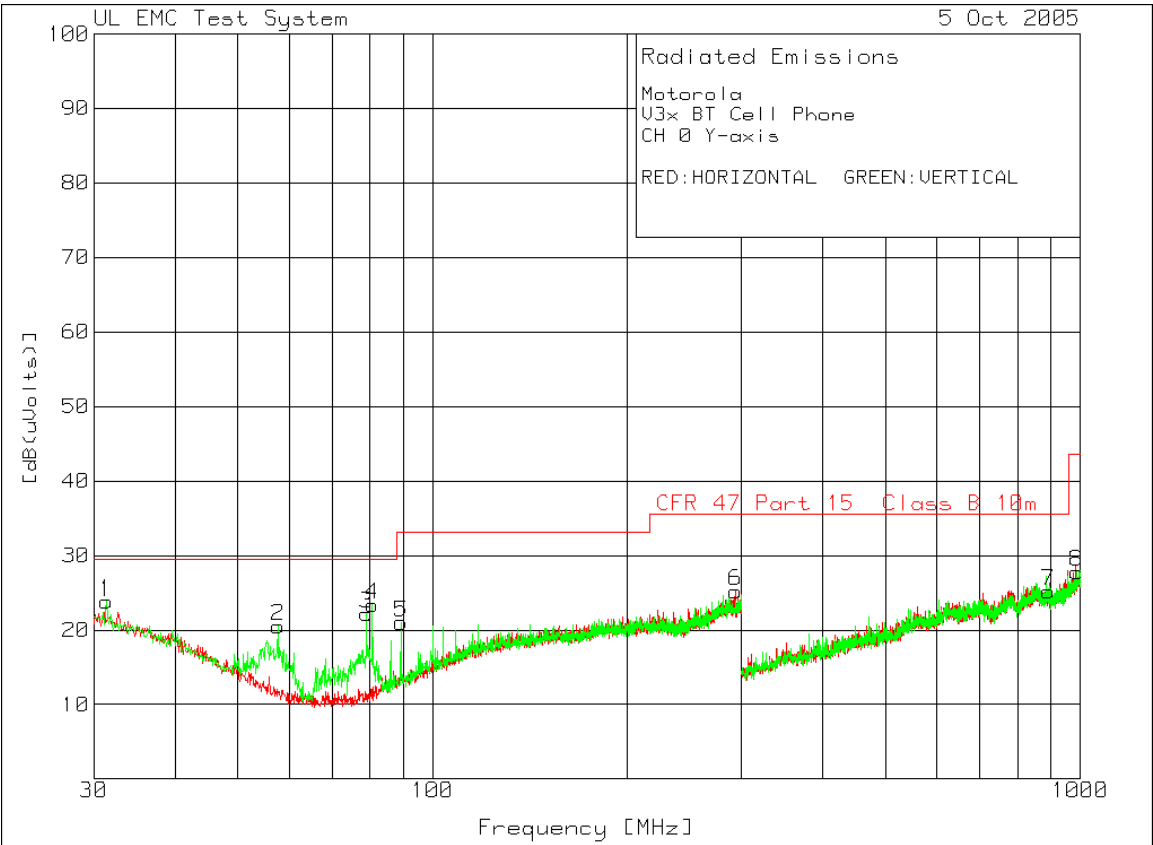
Measurement Results

Attached



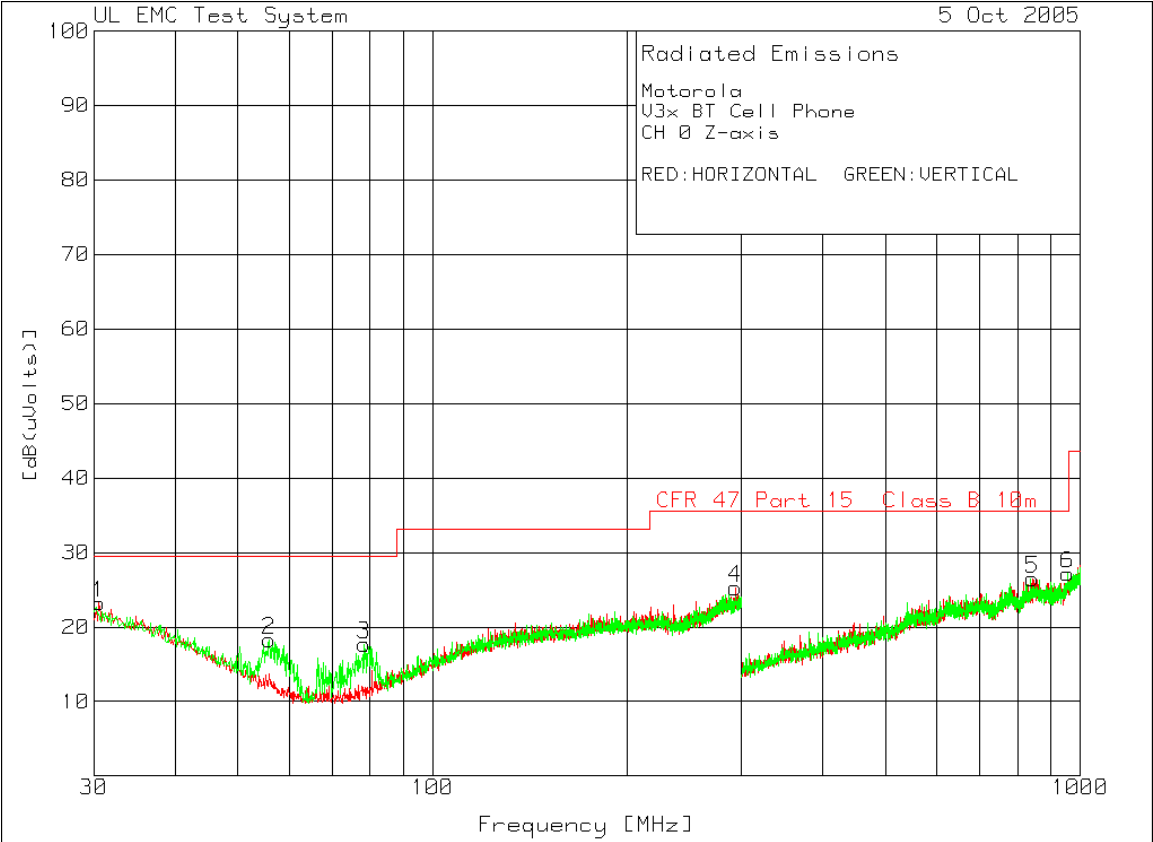
30-1000MHz Low Channel Dual Polarization X

Motorola V3x BT Cell Phone CH 0 X-axis RED:HORIZONTAL GREEN:VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 1 30 - 300MHz											
4	254.9325	37.6	pk	-29.5	16.4	24.5	35.6	-11.1	102	163	Horz
Range 2 30 - 300MHz											
1	39.7151	38.7	pk	-30.3	14.5	22.9	29.6	-6.7	35	200	Vert
2	82.4887	42.8	pk	-30.2	7.7	20.3	29.6	-9.3	216	200	Vert
3	123.913	39.8	pk	-30	13.6	23.4	33.1	-9.7	355	200	Vert
Range 3 300 - 1000MHz											
5	829.985	36	pk	-31.6	22.2	26.6	35.6	-9	160	100	Horz
Range 4 300 - 1000MHz											
6	963.968	34.9	pk	-31.3	23.3	26.9	43.5	-16.6	273	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



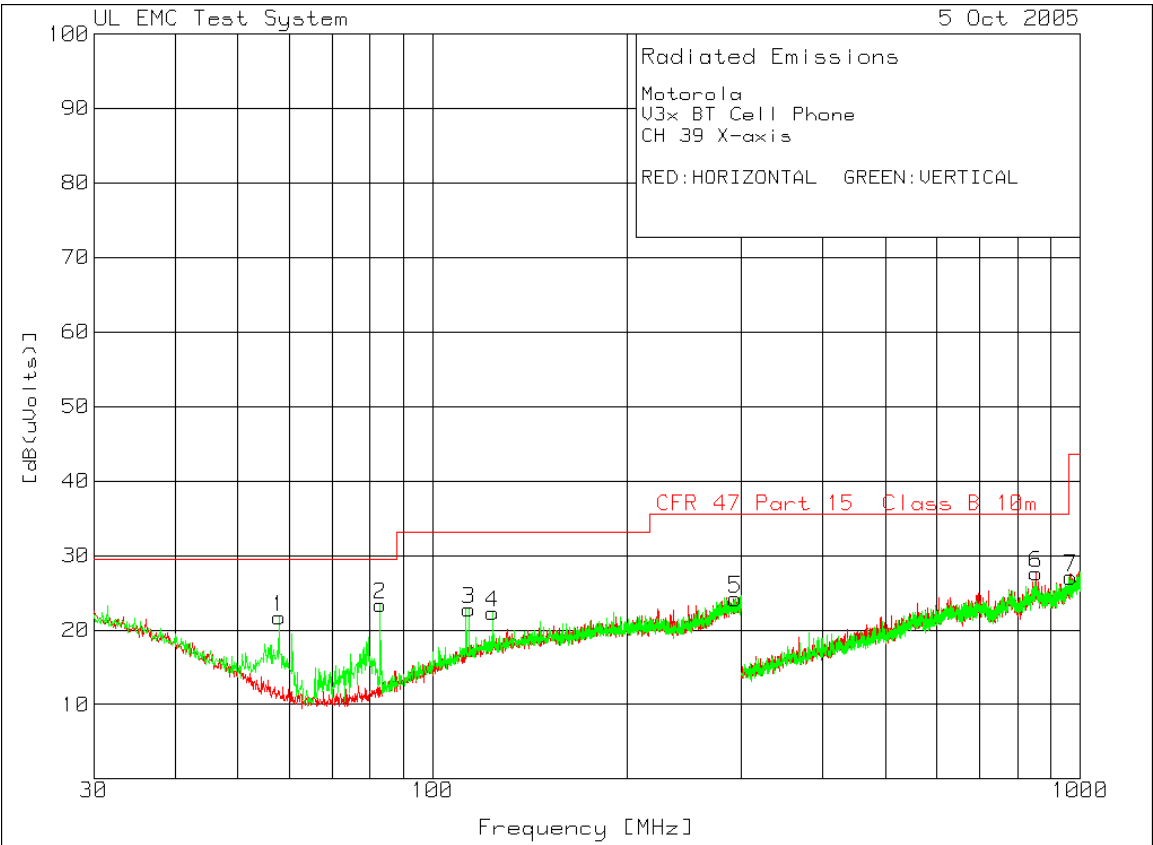
30-1000MHz Low Channel Dual Polarization Y

Motorola V3x BT Cell Phone CH 0 Y-axis RED: HORIZONTAL GREEN: VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [degs]	Height [cm]	Polarity
Range 1 30 - 300MHz											
6	293.1184	36.3	pk	-29.2	18.1	25.2	35.6	-10.4	256	200	Horz
Range 2 30 - 300MHz											
1	31.3493	36.7	pk	-30.4	17.5	23.8	29.6	-5.8	11	100	Vert
2	57.6612	43.4	pk	-30.3	7.4	20.5	29.6	-9.1	177	200	Vert
3	78.9805	45.3	pk	-30.2	7.1	22.2	29.6	-7.4	301	200	Vert
4	80.7346	46.2	pk	-30.2	7.4	23.4	29.6	-6.2	166	200	Vert
5	89.3703	42.2	pk	-30.2	9	21	33.1	-12.1	154	200	Vert
Range 3 300 - 1000MHz											
7	892.2539	34.4	pk	-31.7	22.5	25.2	35.6	-10.4	233	100	Horz
Range 4 300 - 1000MHz											
8	988.8056	34.7	pk	-30.7	23.8	27.8	43.5	-15.7	279	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



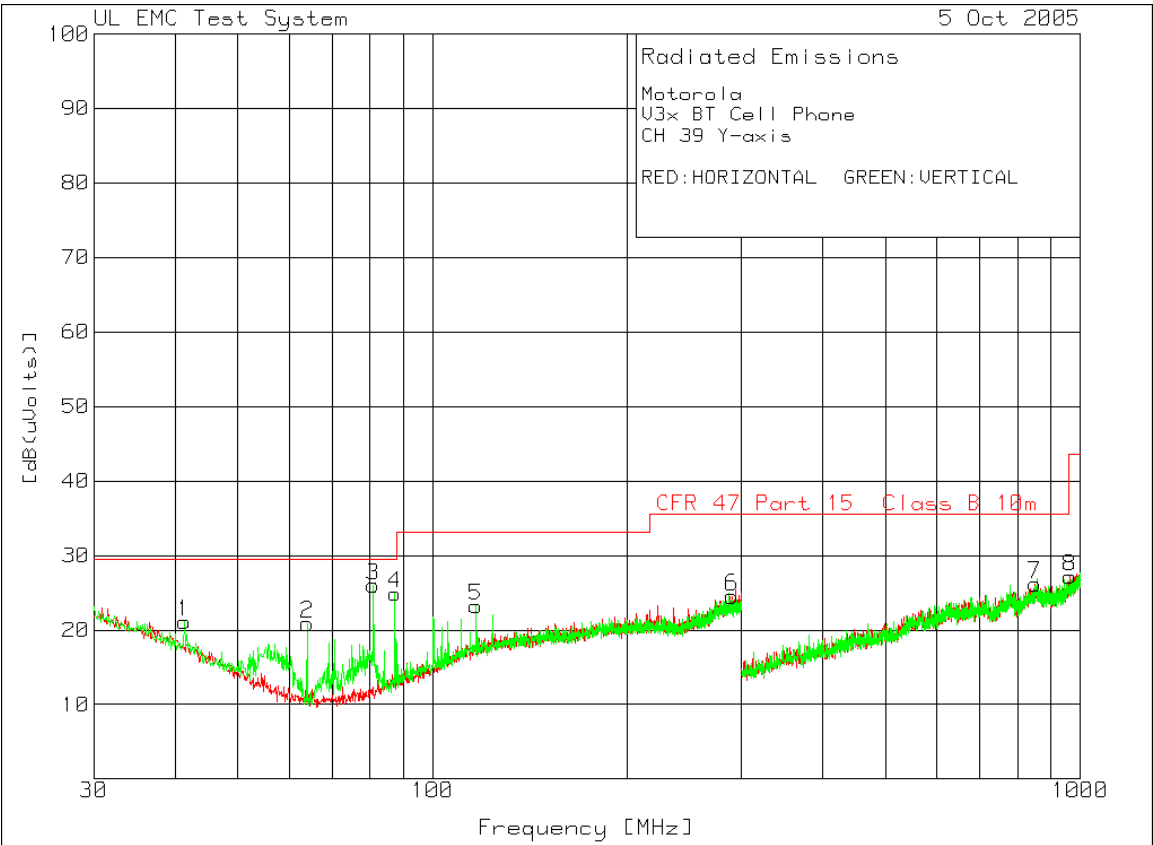
30-1000MHz Low Channel Dual Polarization Z

Motorola V3x BT Cell Phone CH 0 Z-axis RED:HORIZONTAL GREEN:VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 1 30 - 300MHz											
1	30.5397	35.7	pk	-30.4	17.9	23.2	29.6	-6.4	189	200	Horz
4	293.2533	36.4	pk	-29.2	18.1	25.3	35.6	-10.3	9	200	Horz
Range 2 30 - 300MHz											
2	55.907	40.7	pk	-30.3	7.9	18.3	29.6	-11.3	210	200	Vert
3	78.4408	40.8	pk	-30.2	7.1	17.7	29.6	-11.9	120	200	Vert
Range 3 300 - 1000MHz											
5	843.978	35.6	pk	-31.6	22.5	26.5	35.6	-9.1	132	100	Horz
Range 4 300 - 1000MHz											
6	954.8726	35.1	pk	-31.3	23.4	27.2	35.6	-8.4	268	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											

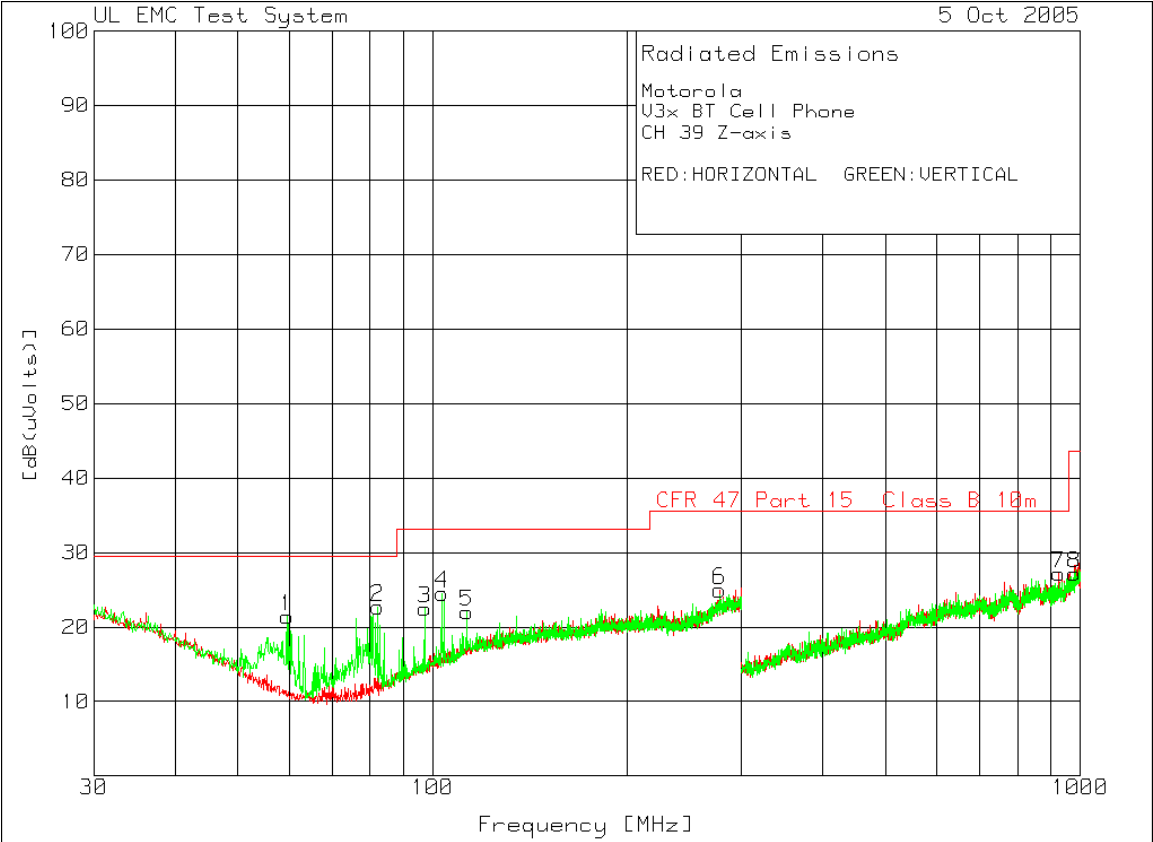


30-1000MHz Mid Channel Dual Polarization X

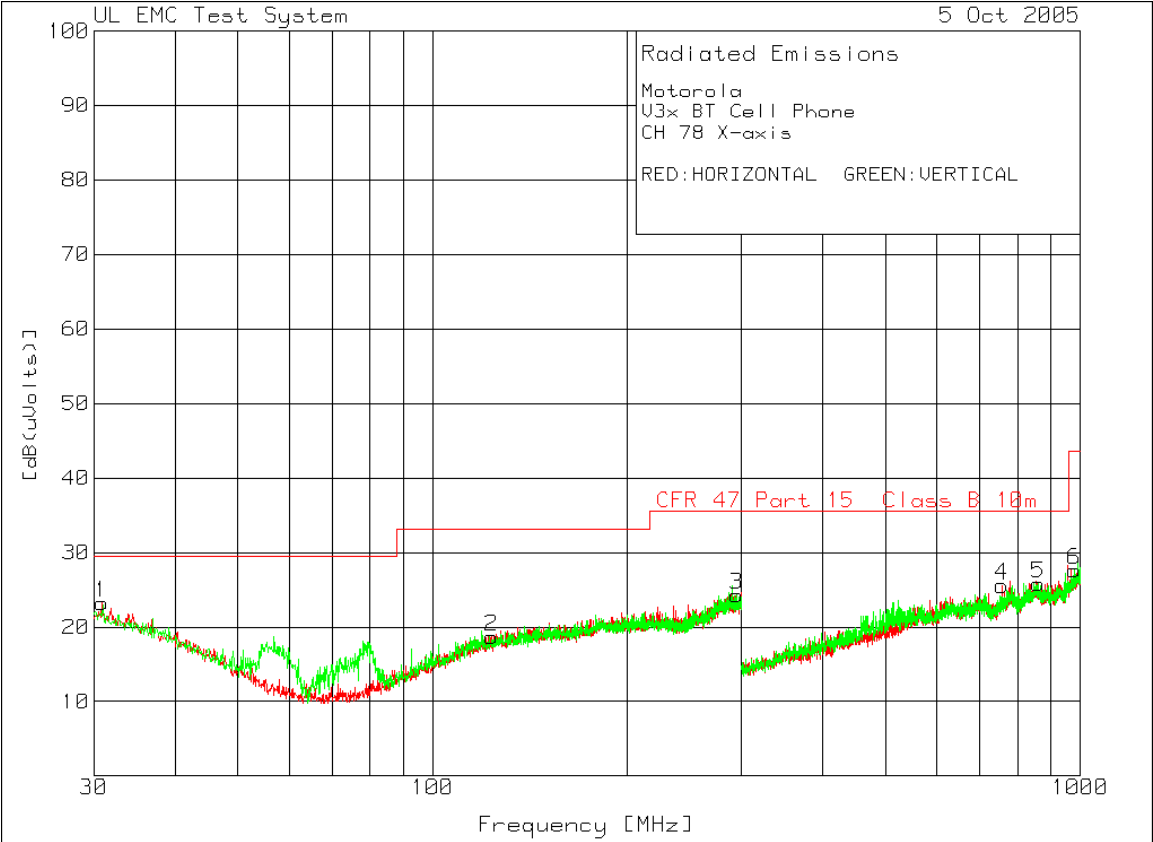
Motorola V3x BT Cell Phone CH 39 X-axis RED:HORIZONTAL GREEN:VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 1 30 - 300MHz											
5	293.1184	35.3	pk	-29.2	18.1	24.2	35.6	-11.4	259	200	Horz
Range 2 30 - 300MHz											
1	57.931	44.7	pk	-30.3	7.3	21.7	29.6	-7.9	355	100	Vert
2	83.0285	45.8	pk	-30.2	7.8	23.4	29.6	-6.2	2	199	Vert
3	113.7931	40.2	pk	-30	12.6	22.8	33.1	-10.3	125	199	Vert
4	123.7781	38.9	pk	-30.1	13.5	22.3	33.1	-10.8	339	199	Vert
Range 3 300 - 1000MHz											
6	855.5223	36.1	pk	-31.5	23	27.6	35.6	-8	114	100	Horz
Range 4 300 - 1000MHz											
7	967.4663	34.9	pk	-31.1	23.3	27.1	43.5	-16.4	103	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



Motorola V3x BT Cell Phone CH 39 Y-axis RED: HORIZONTAL GREEN: VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 1 30 - 300MHz											
6	289.88	35.7	pk	-29.3	18.1	24.5	35.6	-11.1	114	155	Horz
Range 2 30 - 300MHz											
1	41.3343	37.6	pk	-30.3	13.8	21.1	29.6	-8.5	35	200	Vert
2	64.003	44.7	pk	-30.2	6.4	20.9	29.6	-8.7	148	100	Vert
3	81.0045	48.7	pk	-30.2	7.5	26	29.6	-3.6	339	100	Vert
4	87.4812	46.4	pk	-30.2	8.7	24.9	29.6	-4.7	159	200	Vert
5	116.7616	40.3	pk	-30.1	13	23.2	33.1	-9.9	328	200	Vert
Range 3 300 - 1000MHz											
7	851.3244	34.9	pk	-31.6	22.9	26.2	35.6	-9.4	183	100	Horz
8	962.5687	35.2	pk	-31.3	23.3	27.2	43.5	-16.3	137	100	Horz
LIMIT 1: CFR 47 Part 15 Class B 10m											

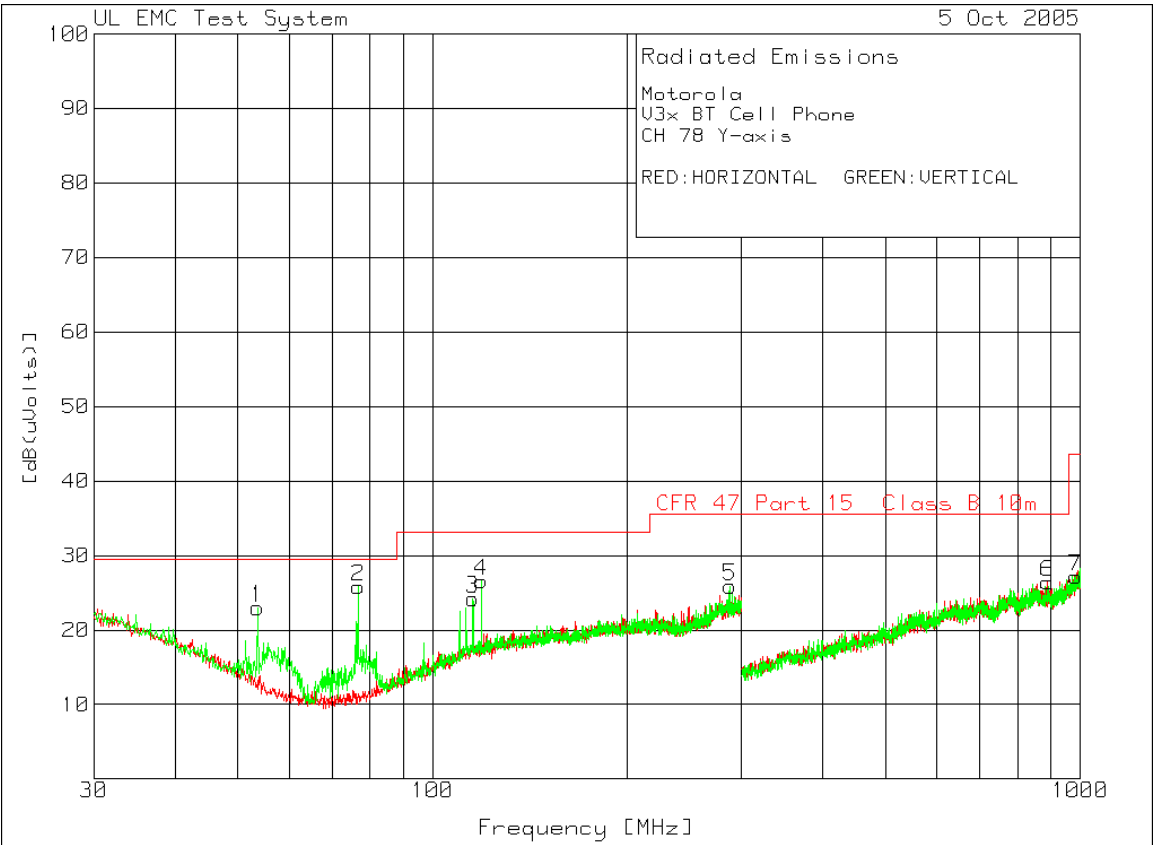


Motorola V3x BT Cell Phone CH 39 Z-axis RED:HORIZONTAL GREEN:VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 1 30 - 300MHz											
6	277.4662	36.4	pk	-29.3	17.9	25	35.6	-10.6	227	200	Horz
Range 2 30 - 300MHz											
1	59.5502	44.8	pk	-30.3	6.9	21.4	29.6	-8.2	216	200	Vert
2	82.2189	45.2	pk	-30.2	7.7	22.7	29.6	-6.9	238	100	Vert
3	97.1964	42.4	pk	-30.1	10.2	22.5	33.1	-10.6	2	200	Vert
4	103.4033	43.3	pk	-30	11.2	24.5	33.1	-8.6	295	100	Vert
5	112.9835	39.5	pk	-30	12.5	22	33.1	-11.1	249	100	Vert
Range 3 300 - 1000MHz											
7	927.2364	36	pk	-31.6	22.8	27.2	35.6	-8.4	341	100	Horz
Range 4 300 - 1000MHz											
8	978.3109	34.6	pk	-31	23.6	27.2	43.5	-16.3	13	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



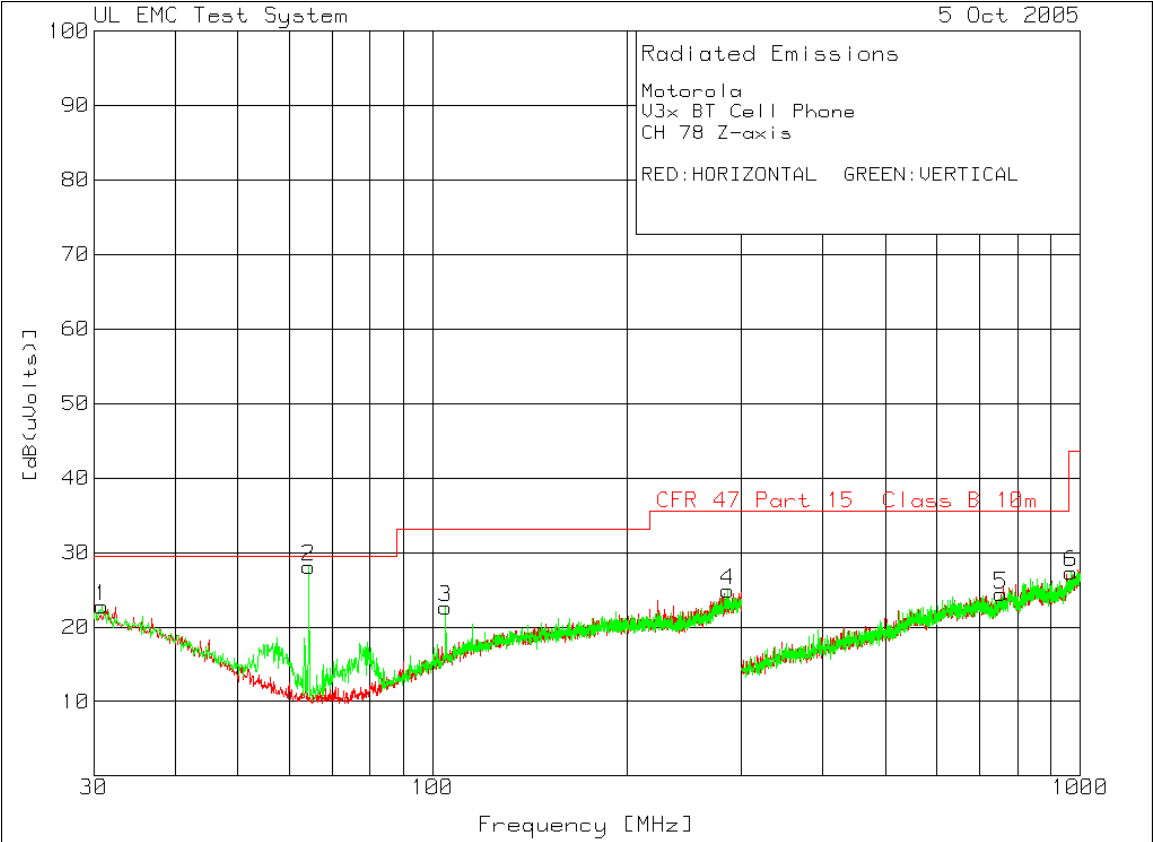
30 -1000MHz High Channel Dual Polarization X

Motorola V3x BT Cell Phone CH 78 X-axis RED:HORIZONTAL GREEN:VERTICAL												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity	
Range 1 30 - 300MHz												
1	30.8096	35.8	pk	-30.4	17.8	23.2	29.6	-6.4	170	199	Horz	
2	123.1034	35.3	pk	-30.1	13.5	18.7	33.1	-14.4	35	199	Horz	
Range 2 30 - 300MHz												
3	294.6026	35.4	pk	-29.3	18.2	24.3	35.6	-11.3	193	199	Vert	
Range 3 300 - 1000MHz												
4	756.5218	35.6	pk	-31.1	21.1	25.6	35.6	-10	59	100	Horz	
Range 4 300 - 1000MHz												
5	861.1195	34.7	pk	-31.6	22.7	25.8	35.6	-9.8	24	100	Vert	
6	977.6112	34.9	pk	-30.9	23.6	27.6	43.5	-15.9	171	100	Vert	
LIMIT 1: CFR 47 Part 15 Class B 10m												

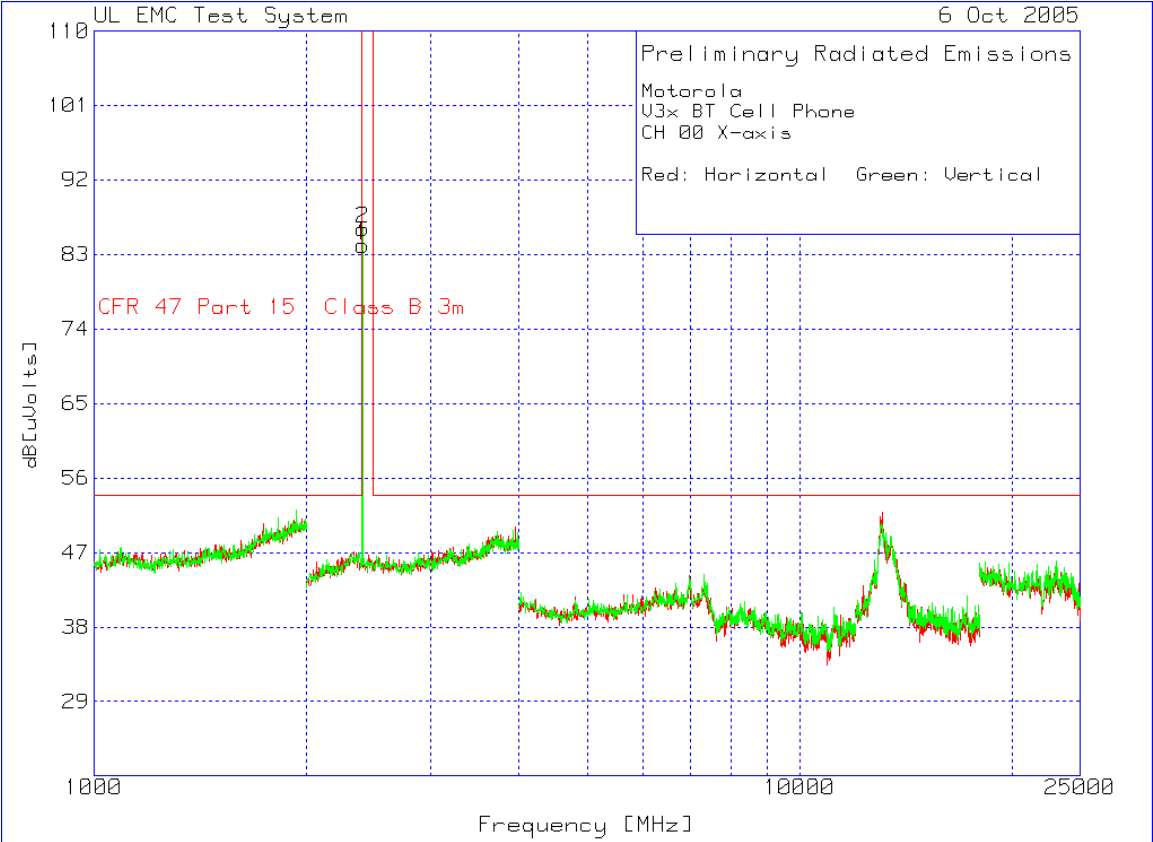


30 -1000MHz High Channel Dual Polarization Y

Motorola V3x BT Cell Phone CH 78 Y-axis RED:HORIZONTAL GREEN:VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	azimuth [deg]	Height [cm]	Polarity
Range 2 30 - 300MHz											
1	53.6132	44.6	pk	-30.3	8.7	23	29.6	-6.6	182	100	Vert
2	76.6866	49.2	pk	-30.2	6.8	25.8	29.6	-3.8	352	100	Vert
3	115.4123	41.4	pk	-30	12.8	24.2	33.1	-8.9	171	200	Vert
4	118.9205	43.4	pk	-30	13.2	26.6	33.1	-6.5	272	200	Vert
5	288.1259	37	pk	-29.3	18.2	25.9	35.6	-9.7	160	100	Vert
Range 3 300 - 1000MHz											
6	889.8051	35.5	pk	-31.6	22.5	26.4	35.6	-9.2	126	100	Horz
Range 4 300 - 1000MHz											
7	983.9081	34.2	pk	-30.7	23.7	27.2	43.5	-16.3	2	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



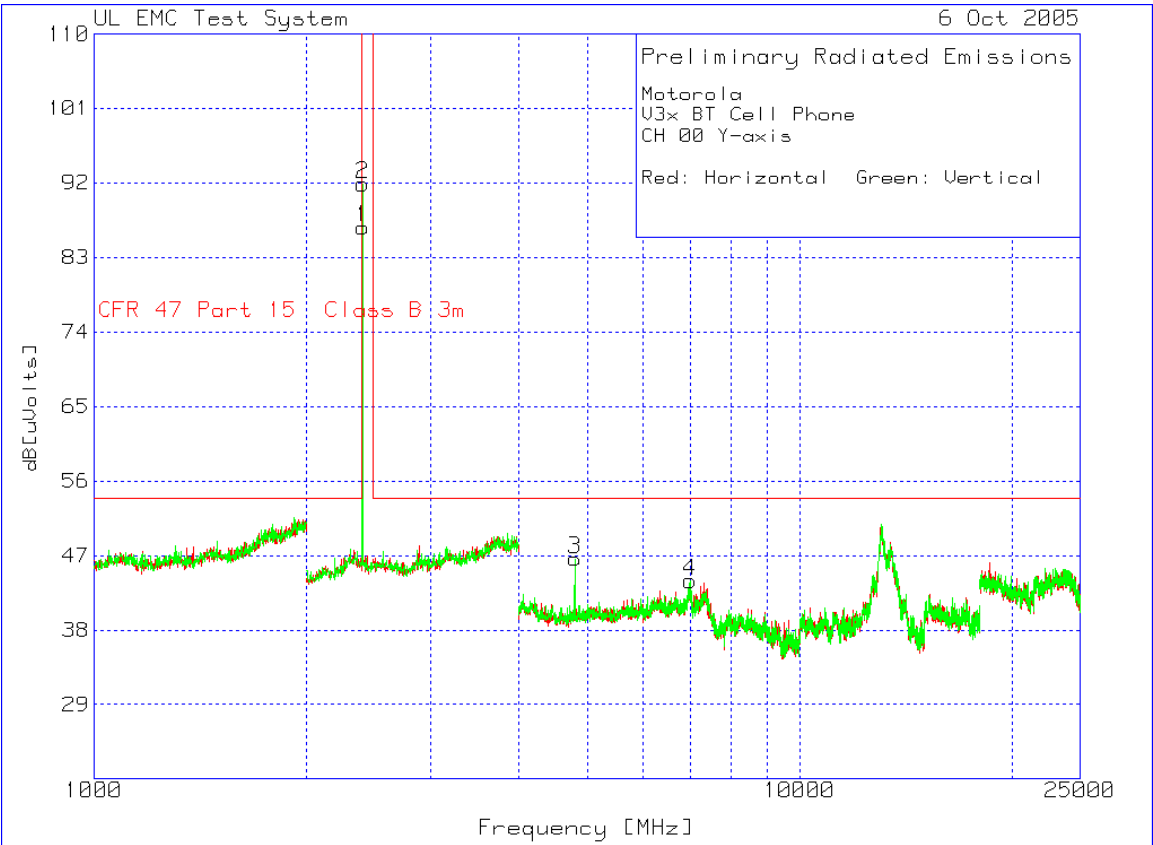
Motorola V3x BT Cell Phone CH 78 Z-axis RED: HORIZONTAL GREEN: VERTICAL											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit 1	Margin 1[dB]	Azimuth [deg]	Height [cm]	Polarity
Range 2 30 - 300MHz											
1	30.8096	35.4	pk	-30.4	17.8	22.8	29.6	-6.8	24	200	Vert
2	64.4078	51.9	pk	-30.2	6.4	28.1	29.6	-1.5	273	100	Vert
3	104.7526	41.2	pk	-30	11.4	22.6	33.1	-10.5	262	200	Vert
4	285.967	36.1	pk	-29.3	18.1	24.9	35.6	-10.7	318	100	Vert
Range 3 300 - 1000MHz											
5	753.7232	34.6	pk	-31.2	21	24.4	35.6	-11.2	47	100	Horz
Range 4 300 - 1000MHz											
6	966.067	35.3	pk	-31.3	23.3	27.3	43.5	-16.2	308	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 10m											



1-25 GHz Low Channel Dual Polarization X

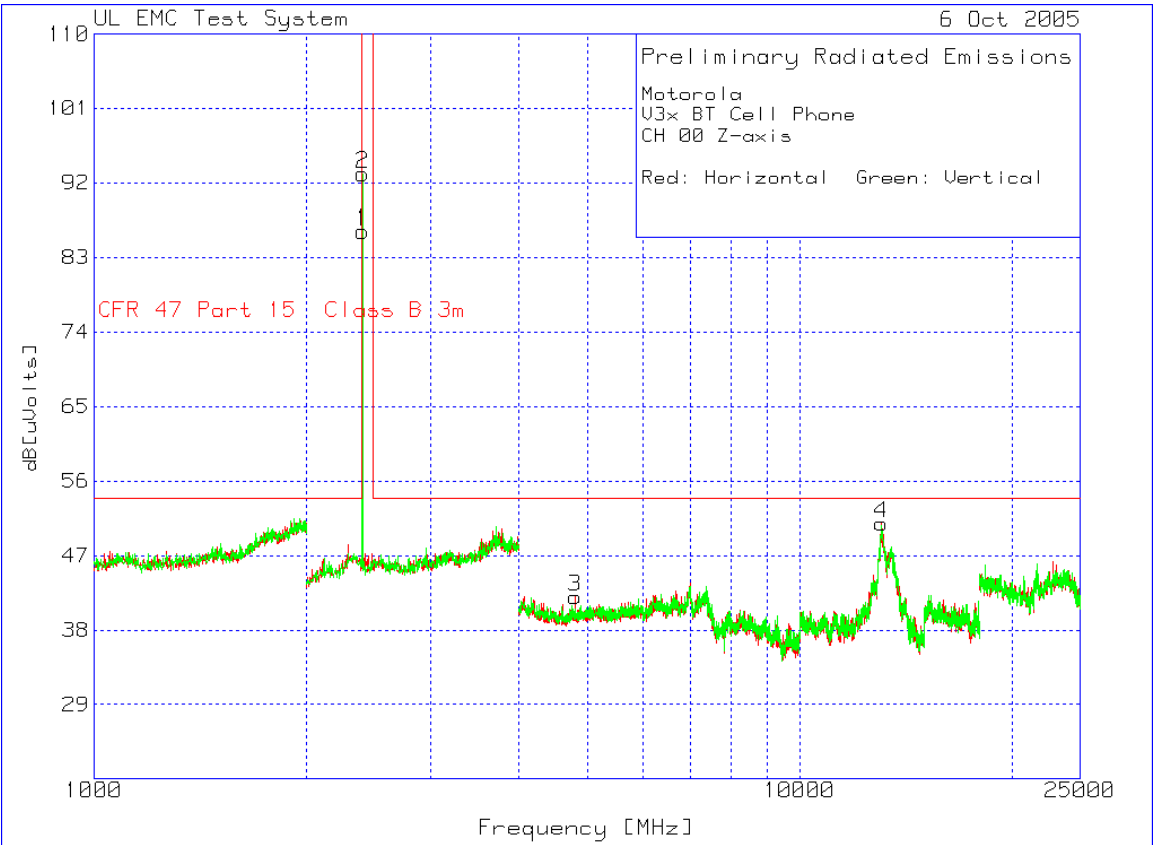
Motorola V3x BT Cell Phone CH 00 X-axis Red: Horizontal Green: Vertical Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz 1	2400.802	57.9	pk	4.4	21.8	84.1	999	-914.9	102	Horz
2 - 4GHz 2000 - 4000MHz 2	2400.802	59.92	pk	4.4	21.8	86.12	999	-912.88	102	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m



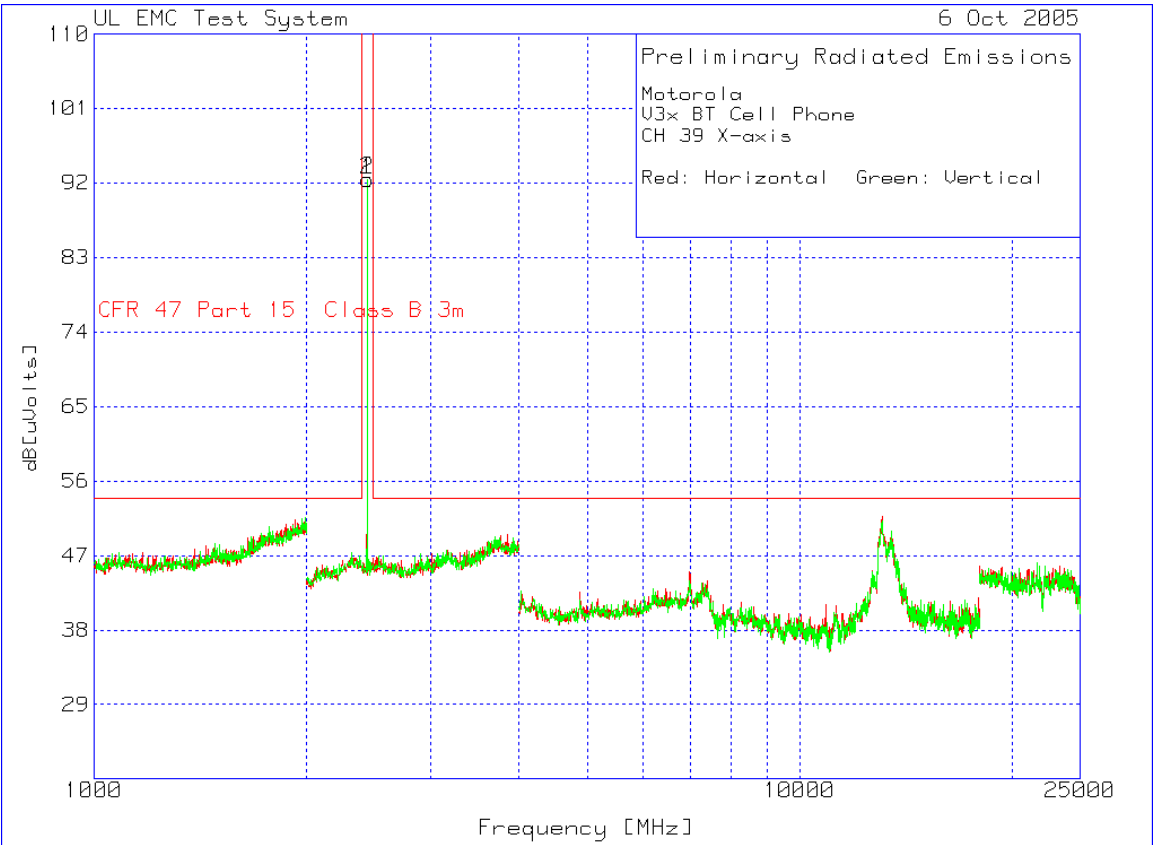
1-25 GHz Low Channel Dual Polarization Y

Motorola											
V3x BT Cell Phone											
CH 00 Y-axis											
Red: Horizontal Green: Vertical											
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity	
2 - 4GHz 2000 - 4000MHz											
1	2400.802	60.44	pk	4.4	21.8	86.64	999	-912.36	100	Horz	
2 - 4GHz 2000 - 4000MHz											
2	2400.802	65.7	pk	4.4	21.8	91.9	999	-907.1	100	Vert	
4 - 8GHz 4000 - 8000MHz											
3	4804.805	69.5	pk	-50.6	27.7	46.6	54	-7.4	149	Vert	
4	6994.995	58.95	pk	-44.3	29.3	43.95	54	-10.05	149	Vert	
LIMIT 1: CFR 47 Part 15 Class B 3m											



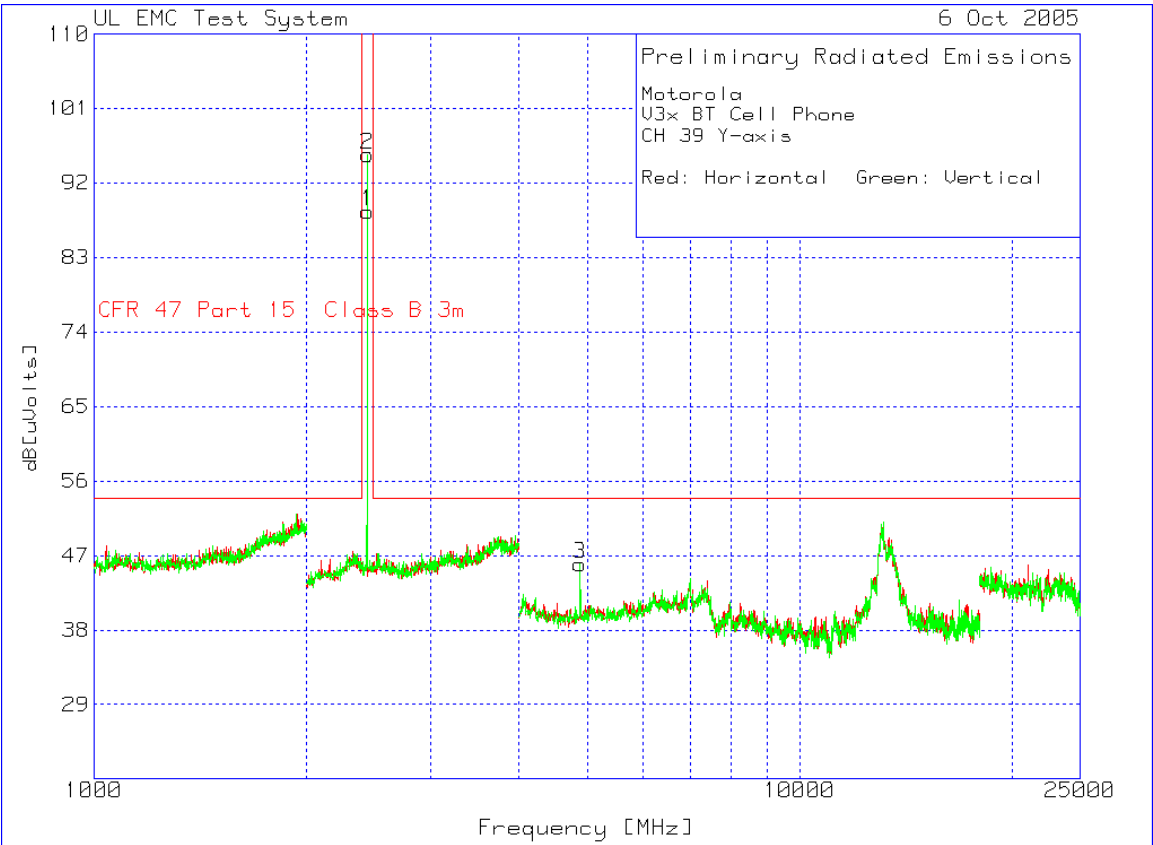
1-25 GHz Low Channel Dual Polarization Z

Motorola V3x BT Cell Phone CH 00 Z-axis Red: Horizontal Green: Vertical Marker Number										
2 - 4GHz 2000 - 4000MHz	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
1	2400.802	59.94	pk	4.4	21.8	86.14	999	-912.86	100	Horz
4 - 8GHz 4000 - 8000MHz										
3	4804.805	64.88	pk	-50.6	27.7	41.98	54	-12.02	100	Horz
12 - 18GHz 12000 - 18000MHz										
4	13063.063	45.18	pk	-34.1	39.8	50.88	54	-3.12	149	Horz
2 - 4GHz 2000 - 4000MHz										
2	2400.802	66.93	pk	4.4	21.8	93.13	999	-905.87	100	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m										



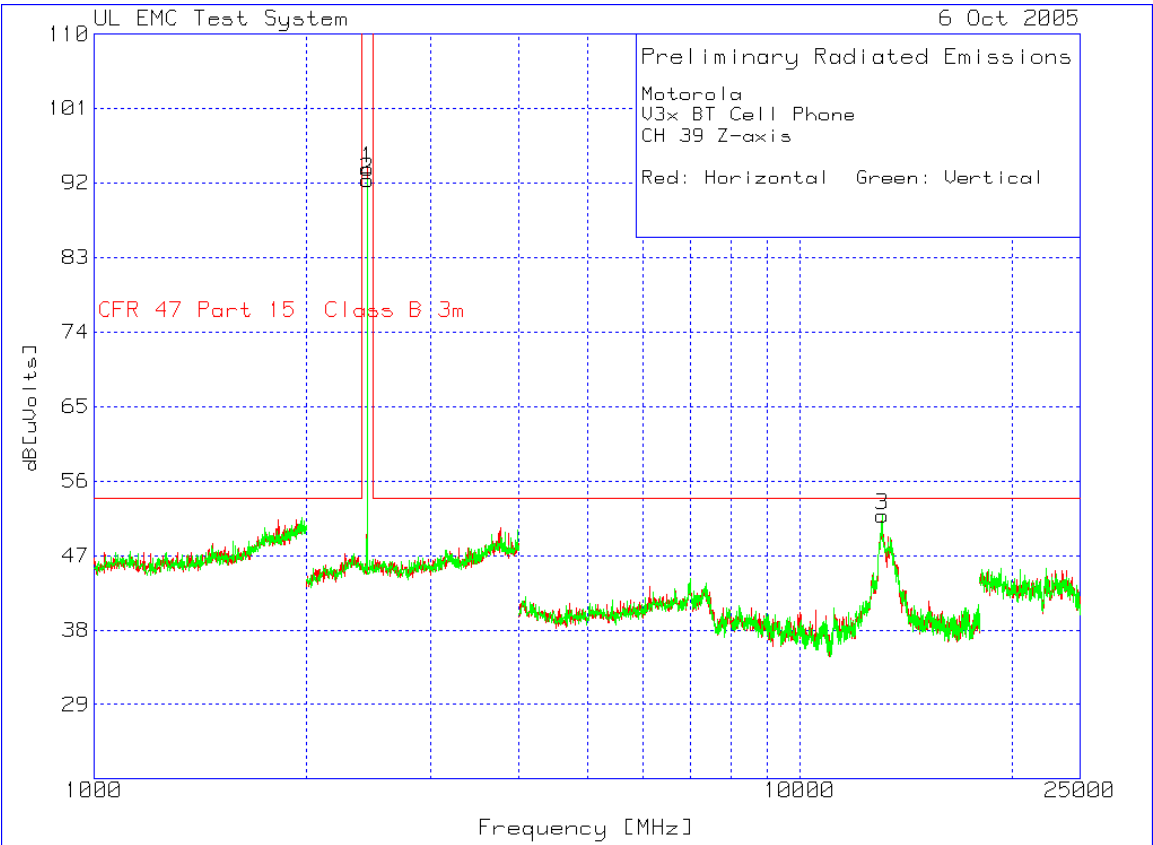
1-25 GHz Mid Channel Dual Polarization X

Motorola V3x BT Cell Phone CH 39 X-axis Red: Horizontal Green: Vertical										
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz 1	2440.882	66.31	pk	4.2	21.9	92.41	999	-906.59	102	Horz
2 - 4GHz 2000 - 4000MHz 2	2440.882	66.33	pk	4.2	21.9	92.43	999	-906.57	102	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m										



1-25 GHz Mid Channel Dual Polarization Y

Motorola V3x BT Cell Phone CH 39 Y-axis Red: Horizontal Green: Vertical Marker Number										
2 - 4GHz 2000 - 4000MHz	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
1	2440.882	62.46	pk	4.2	21.9	88.56	999	-910.44	102	Horz
2 - 4GHz 2000 - 4000MHz	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2	2440.882	69.32	pk	4.2	21.9	95.42	999	-903.58	102	Vert
4 - 8GHz 4000 - 8000MHz	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
3	4881.764	68.73	pk	-50.5	27.7	45.93	54	-8.07	102	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m										

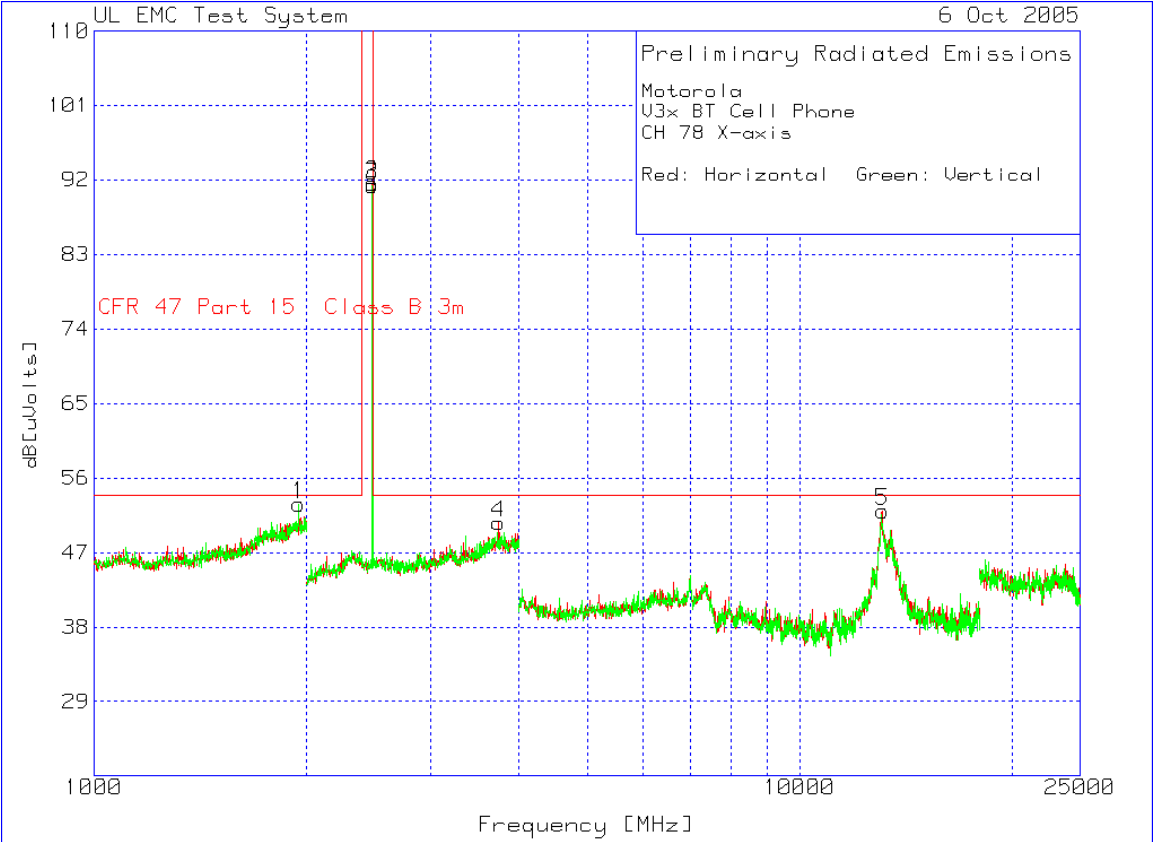


1-25 GHz Mid Channel Dual Polarization Z

Motorola
 V3x BT Cell Phone
 CH 39 Z-axis
 Red: Horizontal Green: Vertical
 Marker
 Number

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz 1	2440.882	67.65	pk	4.2	21.9	93.75	999	-905.25	102	Horz
2 - 4GHz 2000 - 4000MHz 2	2440.882	66.25	pk	4.2	21.9	92.35	999	-906.65	102	Vert
12 - 18GHz 12000 - 18000MHz 3	13094.188	45.73	pk	-33.7	39.8	51.83	54	-2.17	102	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m

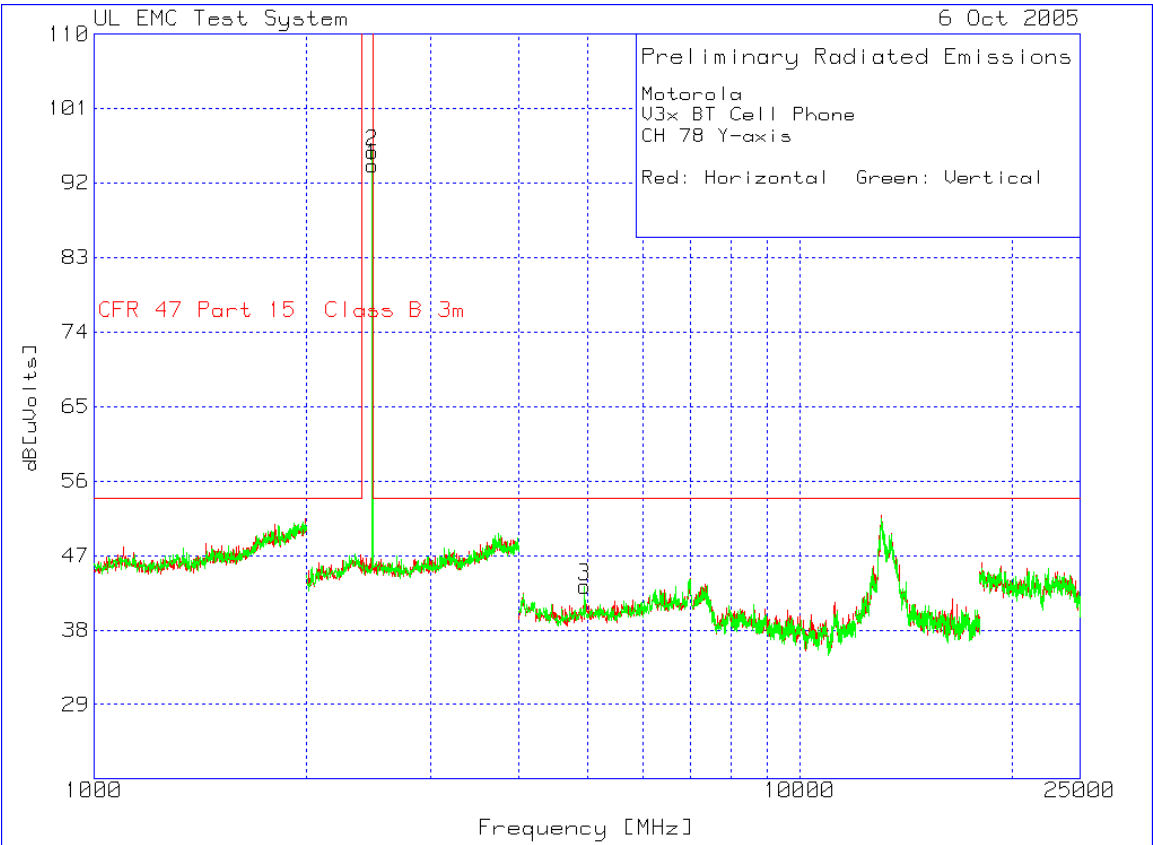


1-25 GHz High Channel Dual Polarization X

Motorola
 V3x BT Cell Phone
 CH 78 X-axis
 Red: Horizontal Green: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz										
2	2480.962	65.52	pk	4.1	22	91.62	999	-907.38	102	Horz
4	3747.495	21.12	pk	5.7	23.8	50.62	54	-3.38	102	Horz
12 - 18GHz 12000 - 18000MHz										
5	13118.236	46.53	pk	-34.3	39.8	52.03	54	-1.97	102	Horz
1 - 2GHz 1000 - 2000MHz										
1	1949.9	21.76	pk	3.6	27.5	52.86	54	-1.14	102	Vert
2 - 4GHz 2000 - 4000MHz										
3	2480.962	65.27	pk	4.1	22	91.37	999	-907.63	102	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m

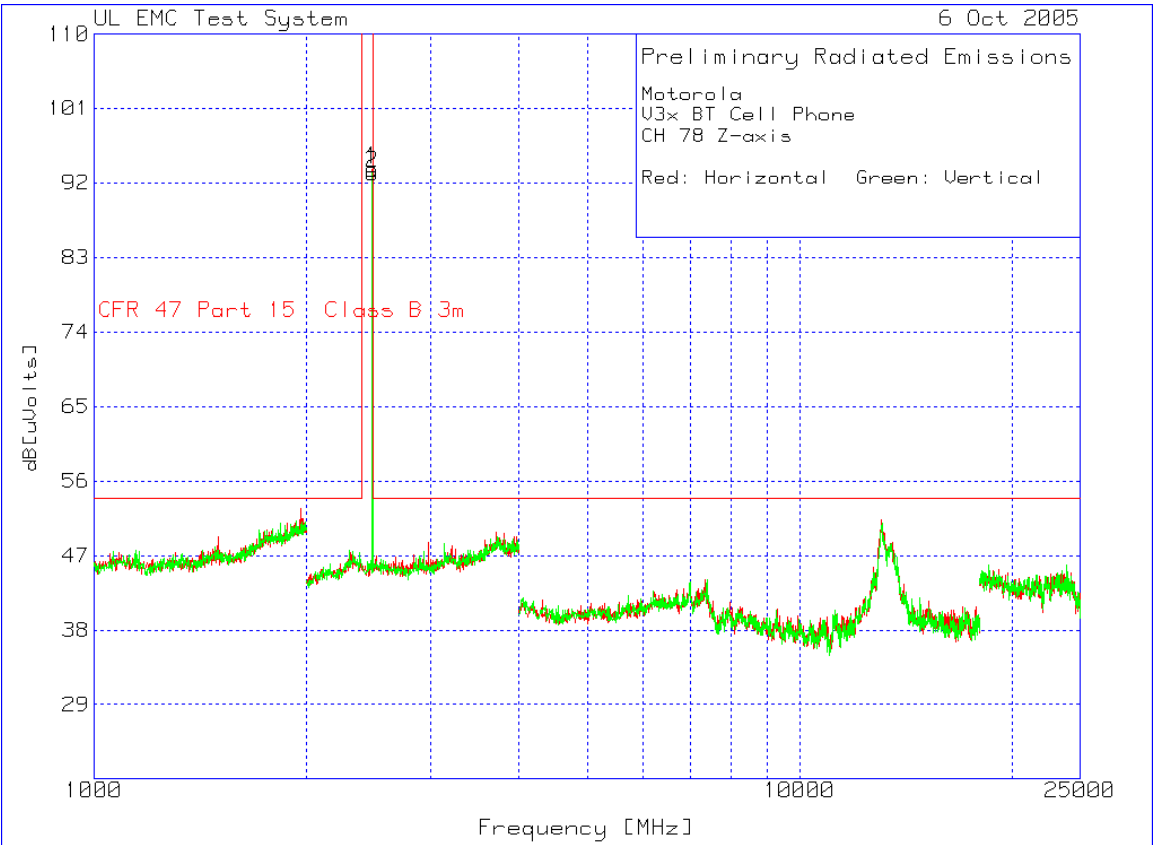


1-25 GHz High Channel Dual Polarization Y

Motorola
 V3x BT Cell Phone
 CH 78 Y-axis
 Red: Horizontal Green: Vertical

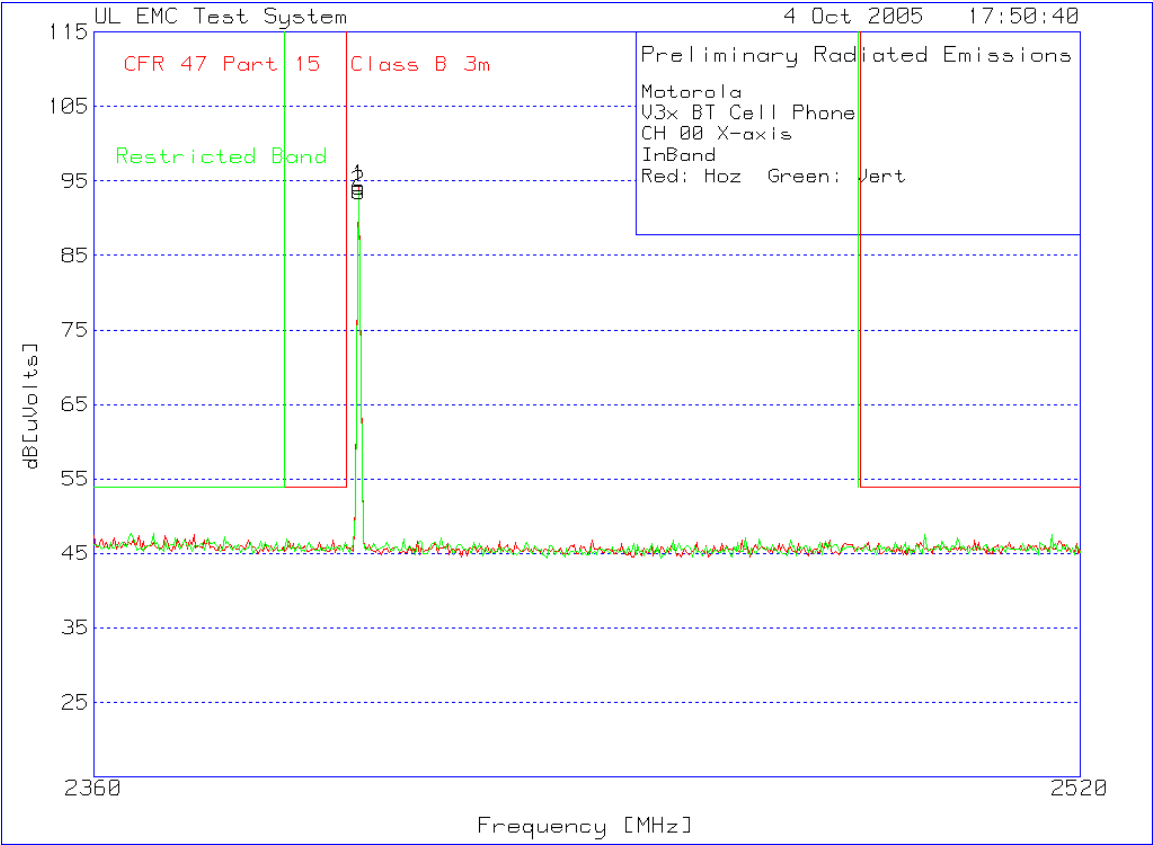
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz 1	2480.962	68.01	pk	4.1	22	94.11	999	-904.89	102	Horz
2 - 4GHz 2000 - 4000MHz 2	2480.962	69.66	pk	4.1	22	95.76	999	-903.24	102	Vert
4 - 8GHz 4000 - 8000MHz 3	4961.924	66.28	pk	-50.8	27.8	43.28	54	-10.72	102	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m



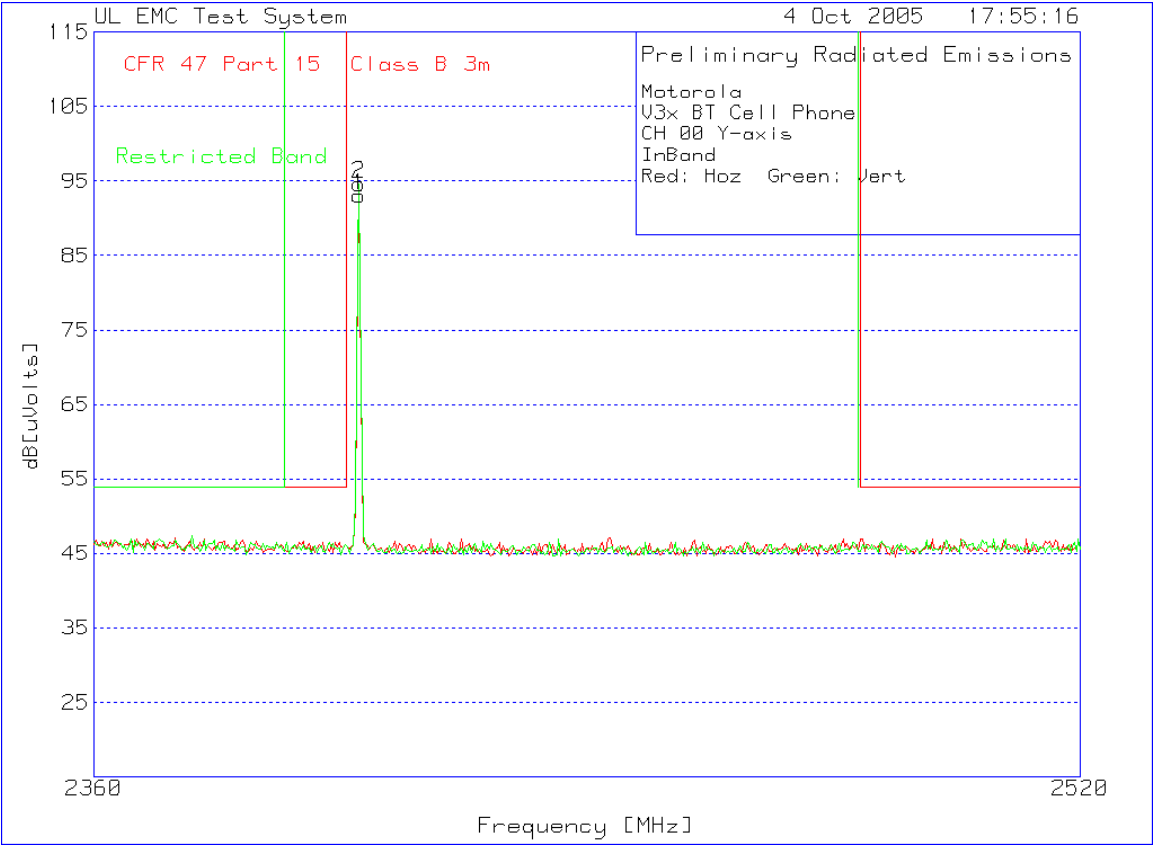
Motorola V3x BT Cell Phone CH 78 Z-axis Red: Horizontal Green: Vertical										
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
2 - 4GHz 2000 - 4000MHz 1	2480.962	67.56	pk	4.1	22	93.66	999	-905.34	102	Horz
2 - 4GHz 2000 - 4000MHz 2	2480.962	67.11	pk	4.1	22	93.21	999	-905.79	102	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m



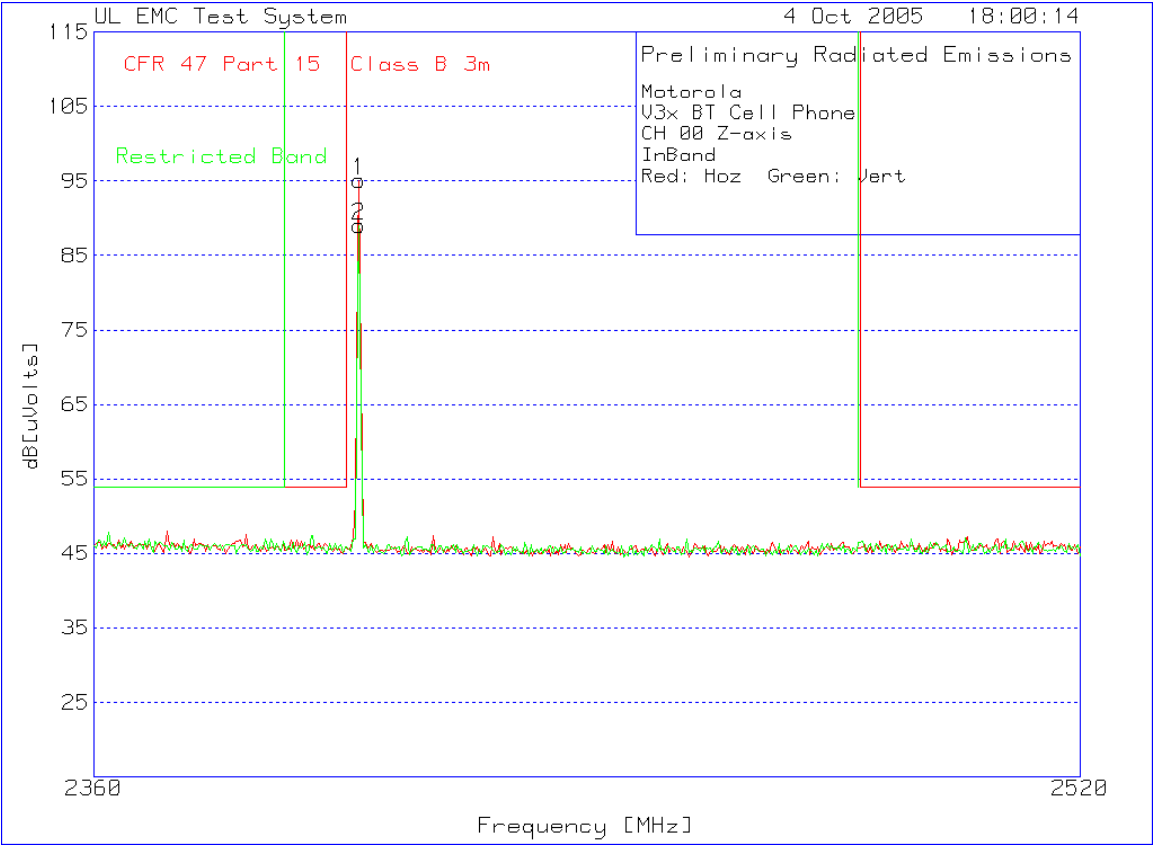
Authorized Band Emissions Low Channel Dual Polarization X

Motorola V3x BT Cell Phone CH 00 X-axis InBand Red: Hoz Green: Vert												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2402.004	67.99	pk	4.4	21.8	94.19	999	-904.81	999	-904.81	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2402.004	67.27	pk	4.4	21.8	93.47	999	-905.53	999	-905.53	149	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m LIMIT 2: Restricted Band												



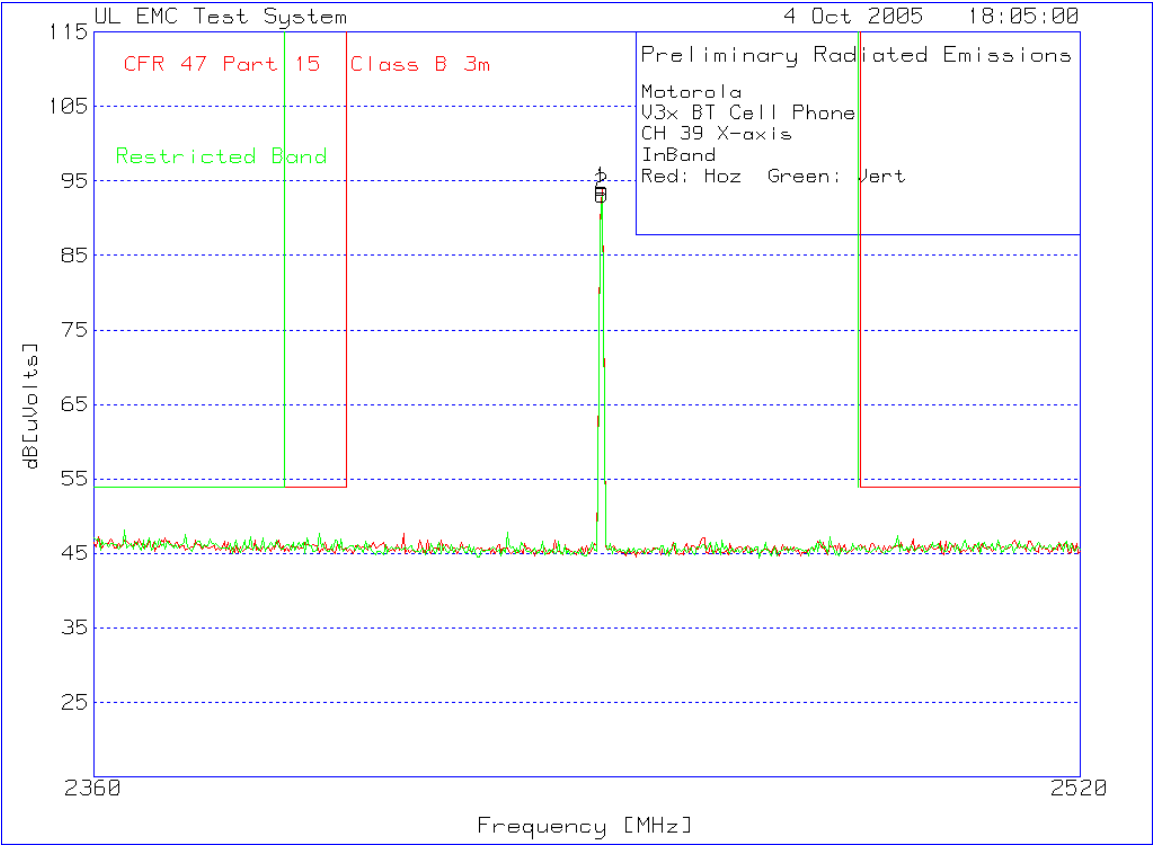
Authorized Band Emissions Low Channel Dual Polarization Y

Motorola													
V3x BT Cell Phone													
CH 00 Y-axis													
InBand													
Red: Hoz Green: Vert													
Marker	Test	Meter	Detector	Gain/Loss	Transducer	Level	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	
Number	Frequency	Reading	Type	Factor	Factor	dB[uVolts]							
	[MHz]	[dB(uV)]		[dB]	[dB]								
2 - 4GHz 2360 - 2520MHz													
1	2402.004	66.85	pk	4.4	21.8	93.05	999	-905.95	999	-905.95	149	Horz	
2 - 4GHz 2360 - 2520MHz													
2	2402.004	68.46	pk	4.4	21.8	94.66	999	-904.34	999	-904.34	149	Vert	
LIMIT 1: CFR 47 Part 15 Class B 3m													
LIMIT 2: Restricted Band													



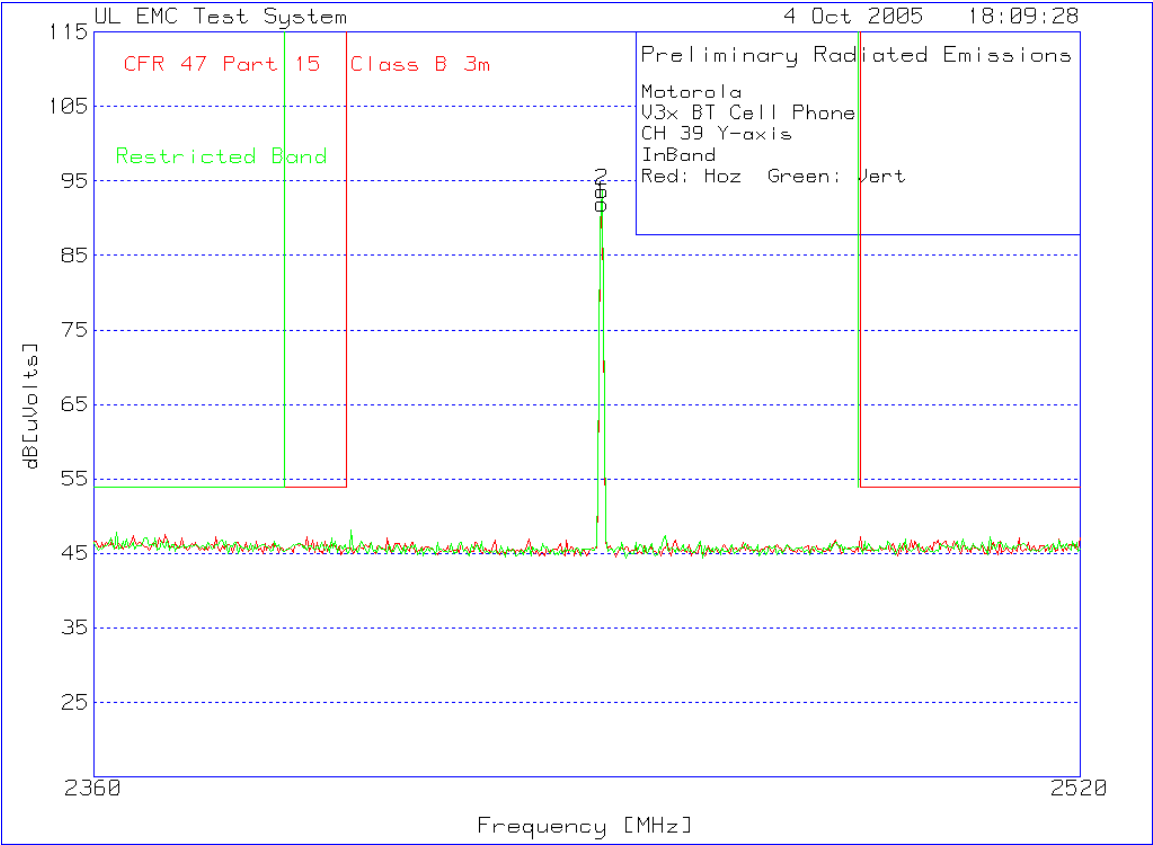
Authorized Band Emissions Low Channel Dual Polarization Z

Motorola V3x BT Cell Phone CH 00 Z-axis InBand Red: Hoz Green: Vert												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2402.004	68.87	pk	4.4	21.8	95.07	999	-903.93	999	-903.93	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2402.004	62.83	pk	4.4	21.8	89.03	999	-909.97	999	-909.97	149	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m LIMIT 2: Restricted Band												



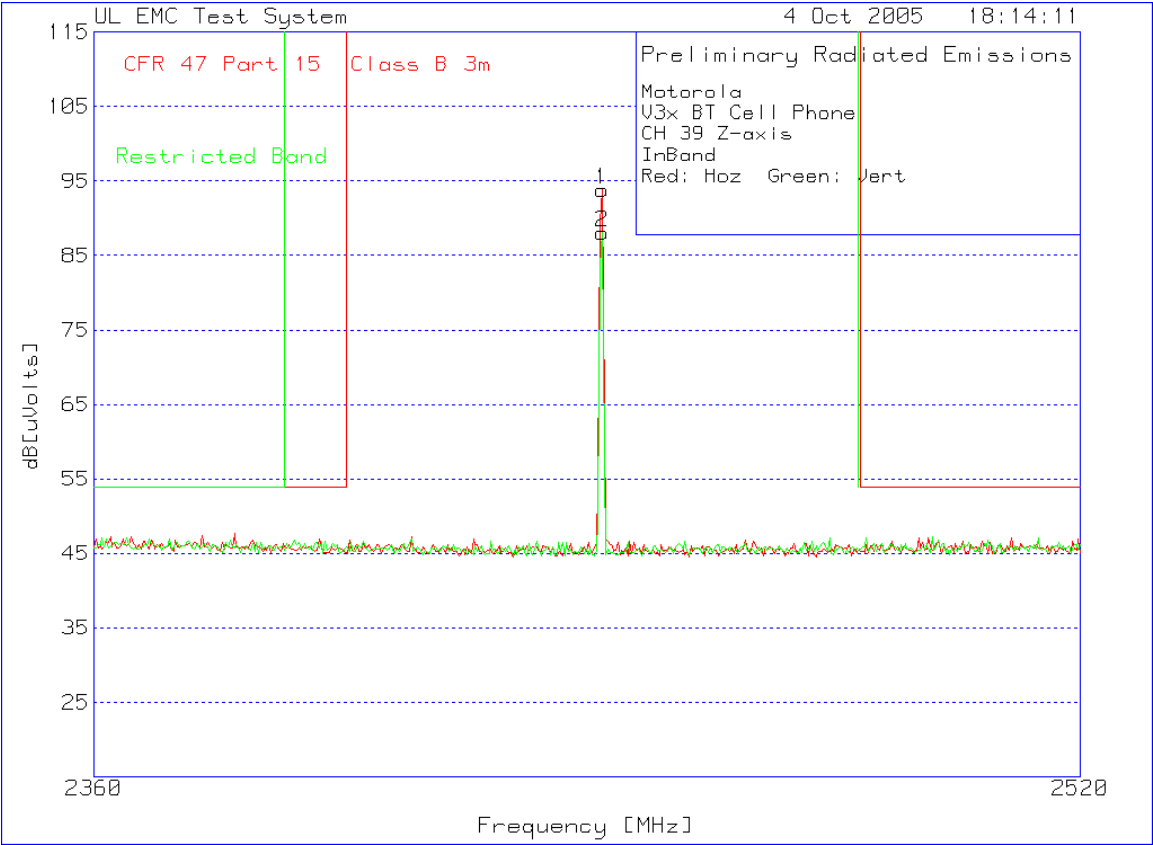
Authorized Band Emissions Mid Channel Dual Polarization X

Motorola V3x BT Cell Phone CH 39 X-axis InBand Red: Hoz Green: Vert												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2441.122	67.88	pk	4.2	21.9	93.98	999	-905.02	999	-905.02	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2441.122	67.03	pk	4.2	21.9	93.13	999	-905.87	999	-905.87	150	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m LIMIT 2: Restricted Band												



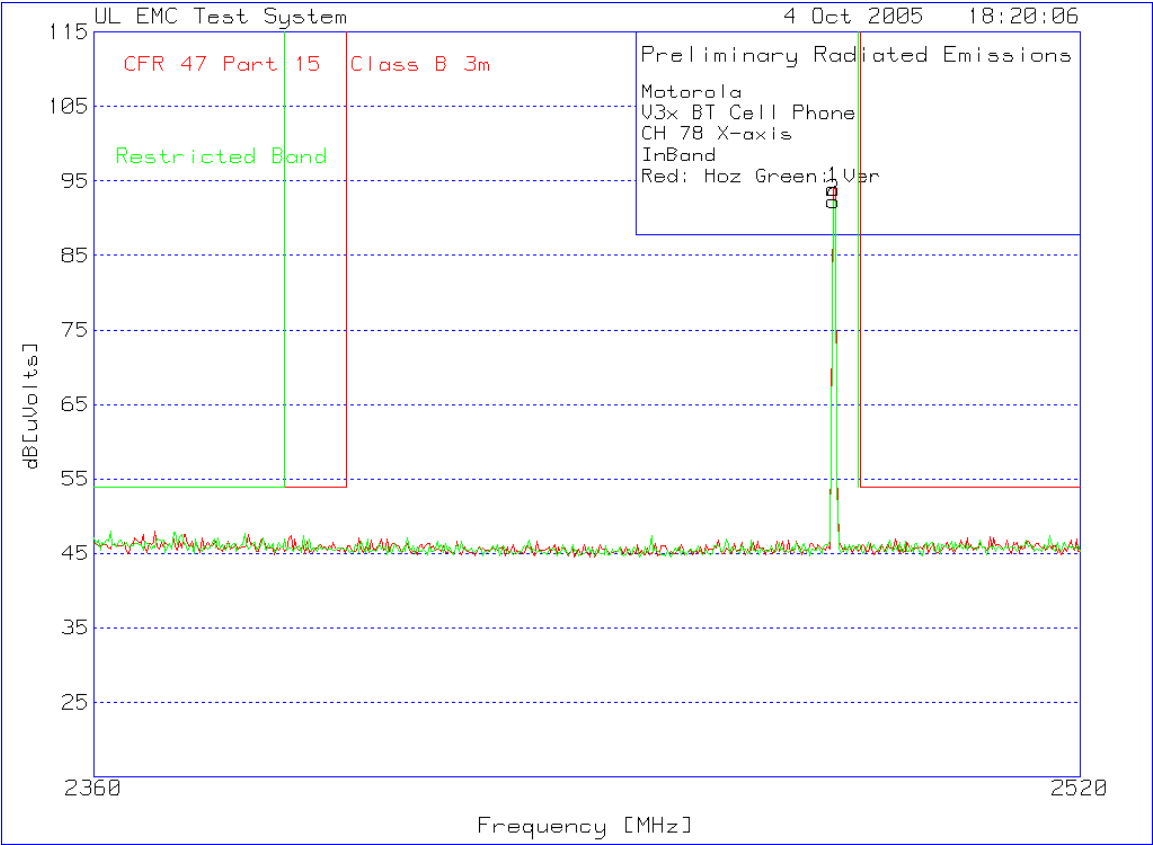
Authorized Band Emissions Mid Channel Dual Polarization Y

Motorola V3x BT Cell Phone CH 39 Y-axis InBand Red: Hoz Green: Vert												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2441.122	65.8	pk	4.2	21.9	91.9	999	-907.1	999	-907.1	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2441.122	67.56	pk	4.2	21.9	93.66	999	-905.34	999	-905.34	149	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m LIMIT 2: Restricted Band												



Authorized Band Emissions Mid Channel Dual Polarization Z

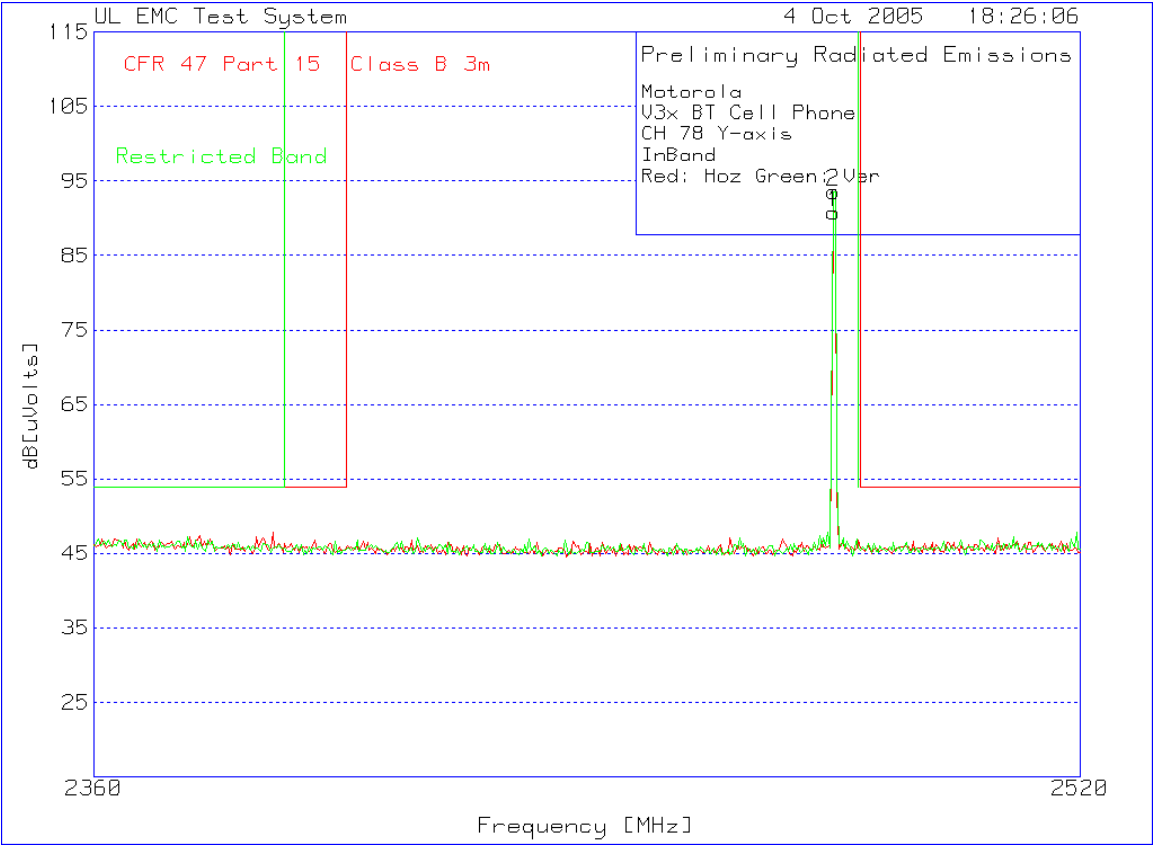
Motorola V3x BT Cell Phone CH 39 Z-axis InBand Red: Hoz Green: Vert												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2441.122	67.68	pk	4.2	21.9	93.78	999	-905.22	999	-905.22	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2441.122	61.97	pk	4.2	21.9	88.07	999	-910.93	999	-910.93	150	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m												
LIMIT 2: Restricted Band												



Authorized Band Emissions High Channel Dual Polarization X

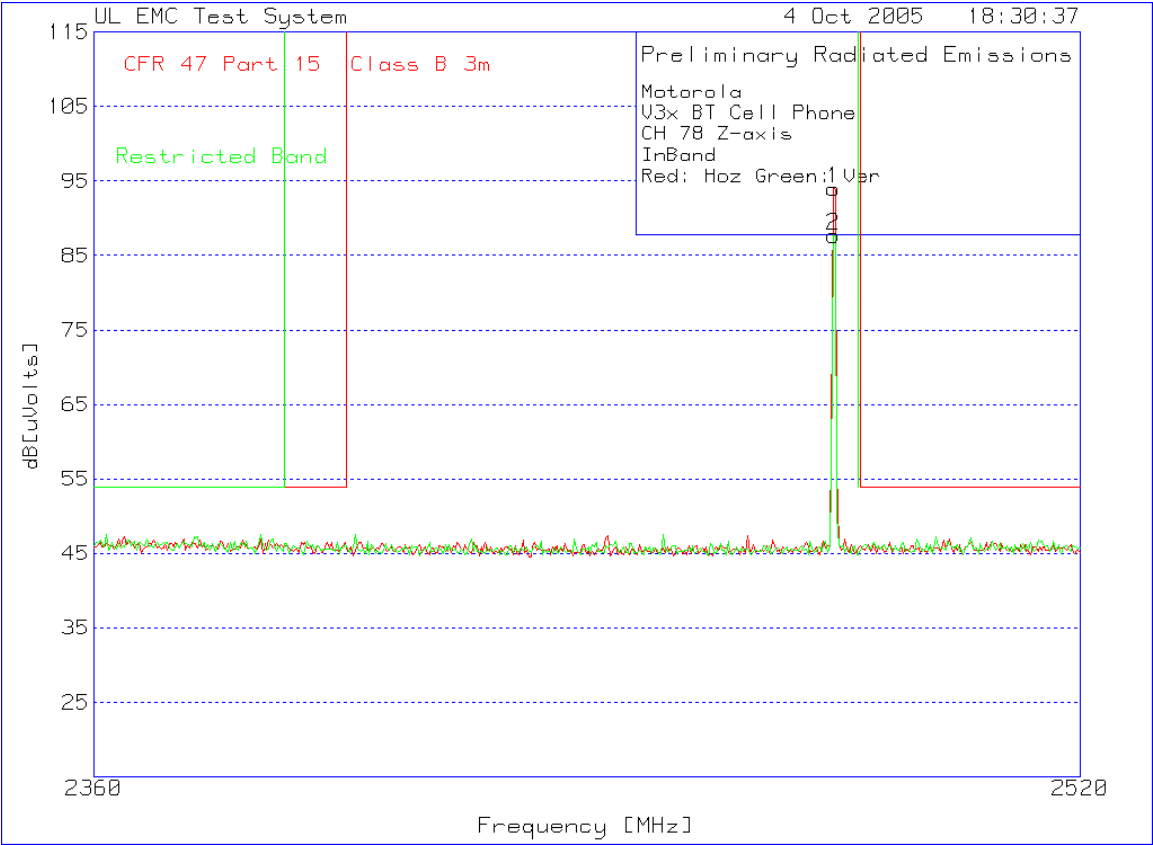
Motorola V3x BT Cell Phone CH 78 X-axis InBand Red: Hoz Green: Ver												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2478.958	67.89	pk	4.1	22	93.99	999	-905.01	999	-905.01	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2478.958	66.16	pk	4.1	22	92.26	999	-906.74	999	-906.74	150	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m
 LIMIT 2: Restricted Band



Authorized Band Emissions High Channel Dual Polarization Y

Motorola V3x BT Cell Phone CH 78 Y-axis InBand Red: Hoz Green: Ver												
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity
2 - 4GHz 2360 - 2520MHz 1	2478.958	64.71	pk	4.1	22	90.81	999	-908.19	999	-908.19	100	Horz
2 - 4GHz 2360 - 2520MHz 2	2478.958	67.49	pk	4.1	22	93.59	999	-905.41	999	-905.41	150	Vert
LIMIT 1: CFR 47 Part 15 Class B 3m												
LIMIT 2: Restricted Band												



Authorized Band Emissions High Channel Dual Polarization Z

Motorola V3x BT Cell Phone CH 78 Z-axis InBand Red: Hoz Green: Ver													
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit 1	Margin 1[dB]	Limit 2	Margin 2[dB]	Height [cm]	Polarity	
2 - 4GHz 2360 - 2520MHz 1	2478.958	67.84	pk	4.1	22	93.94	999	-905.06	999	-905.06	100	Horz	
2 - 4GHz 2360 - 2520MHz 2	2478.958	61.6	pk	4.1	22	87.7	999	-911.3	999	-911.3	149	Vert	
LIMIT 1: CFR 47 Part 15 Class B 3m													
LIMIT 2: Restricted Band													

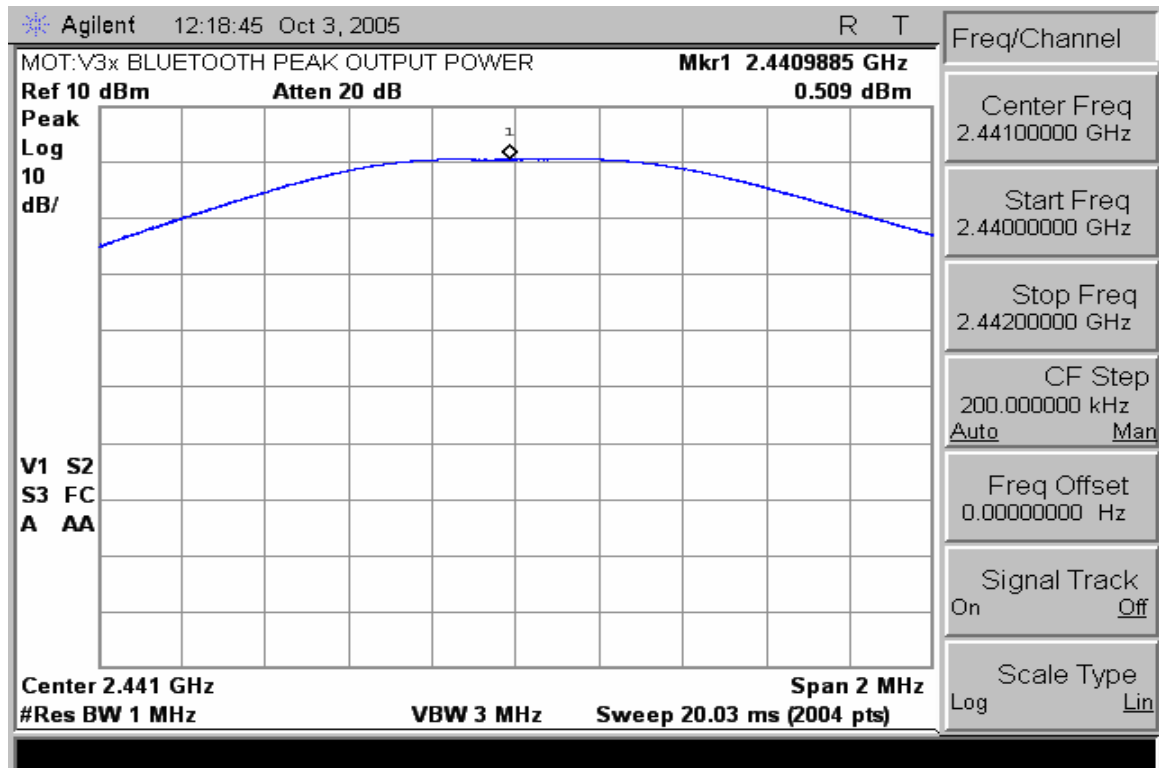
PEAK OUTPUT POWER

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

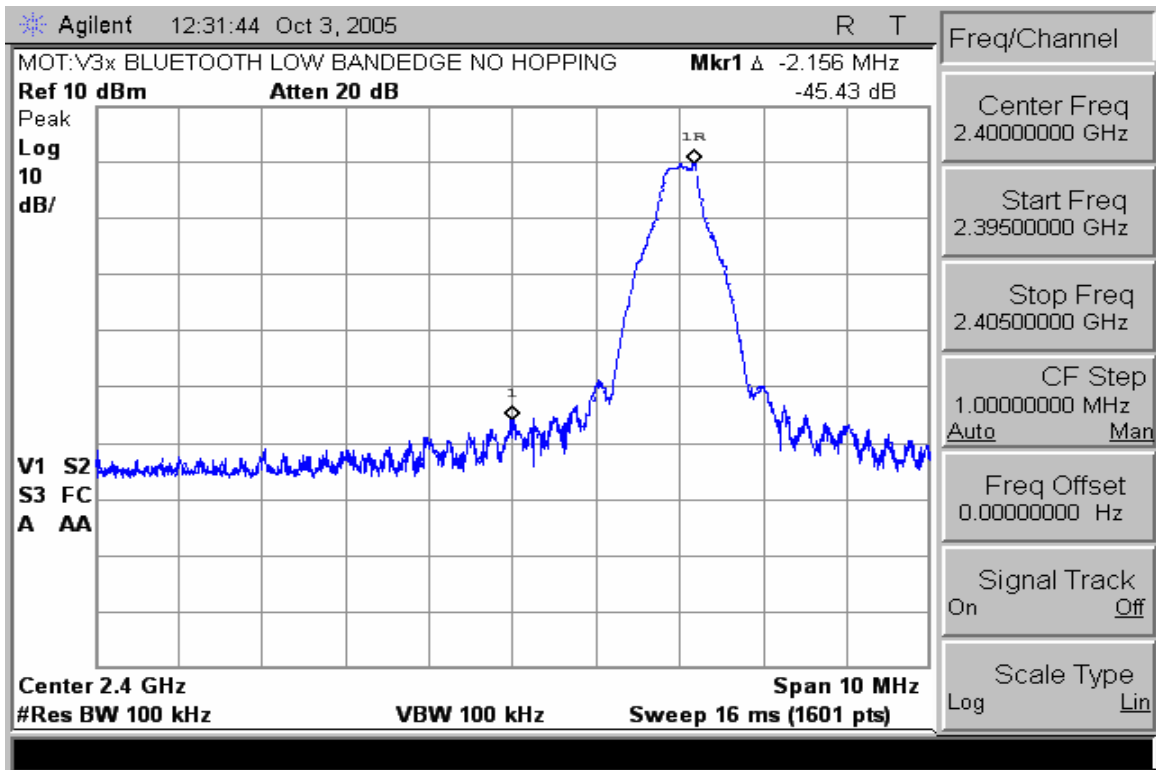
CFR 47 Part 15.247

Measurement Procedure

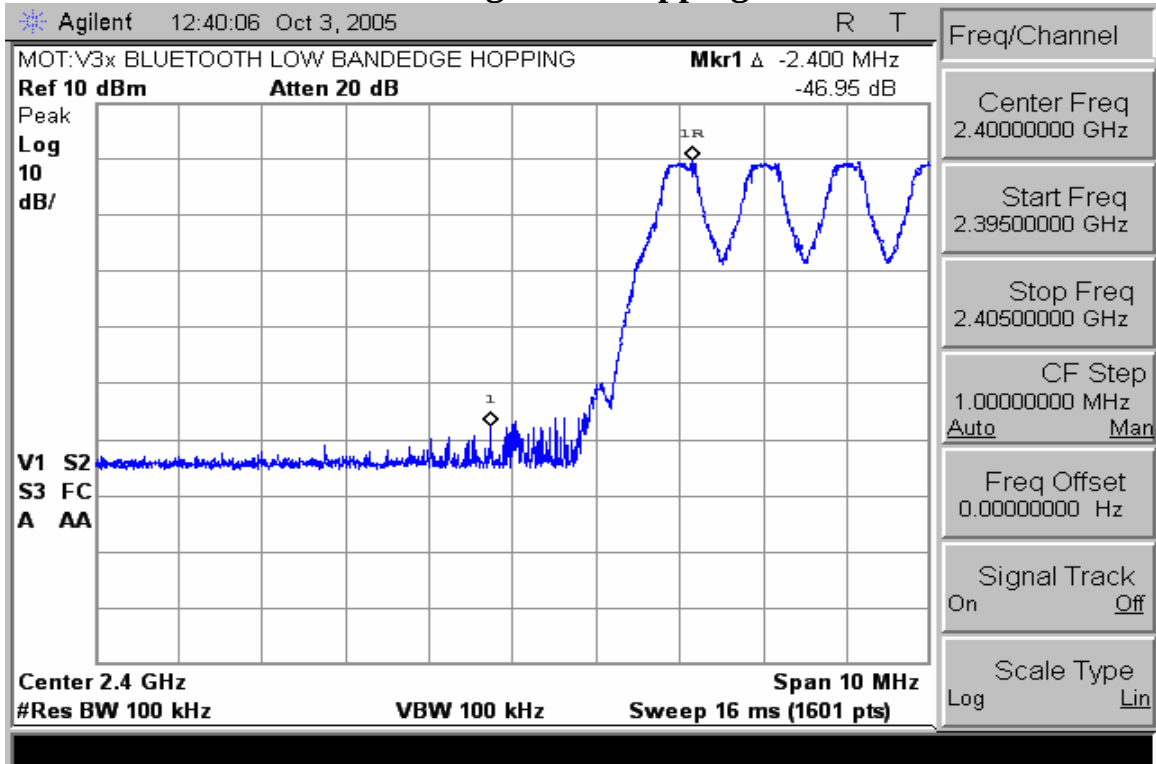
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

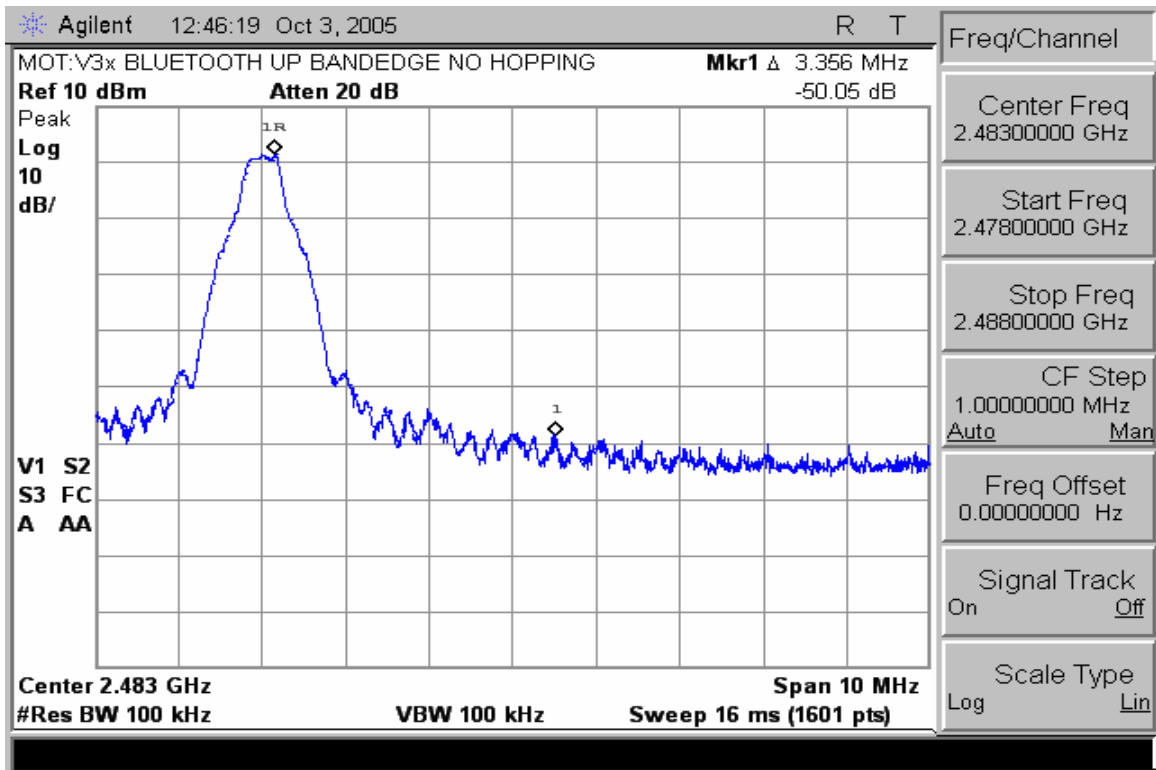
See Attached:



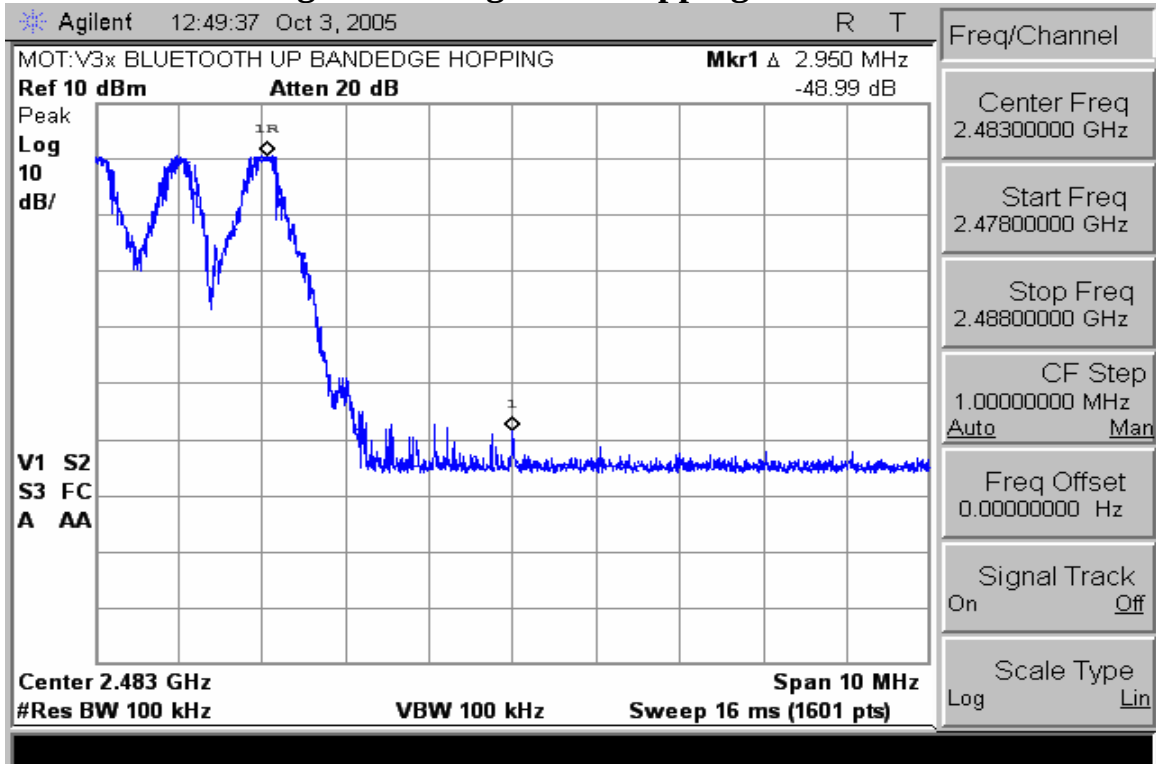
Low Band Edge with Hopping Disabled



Low Band Edge with Hopping Enabled



High Band Edge with Hopping Disabled



High Band Edge with Hopping Enabled

SPURIOUS RF CONDUCTED EMISSIONS

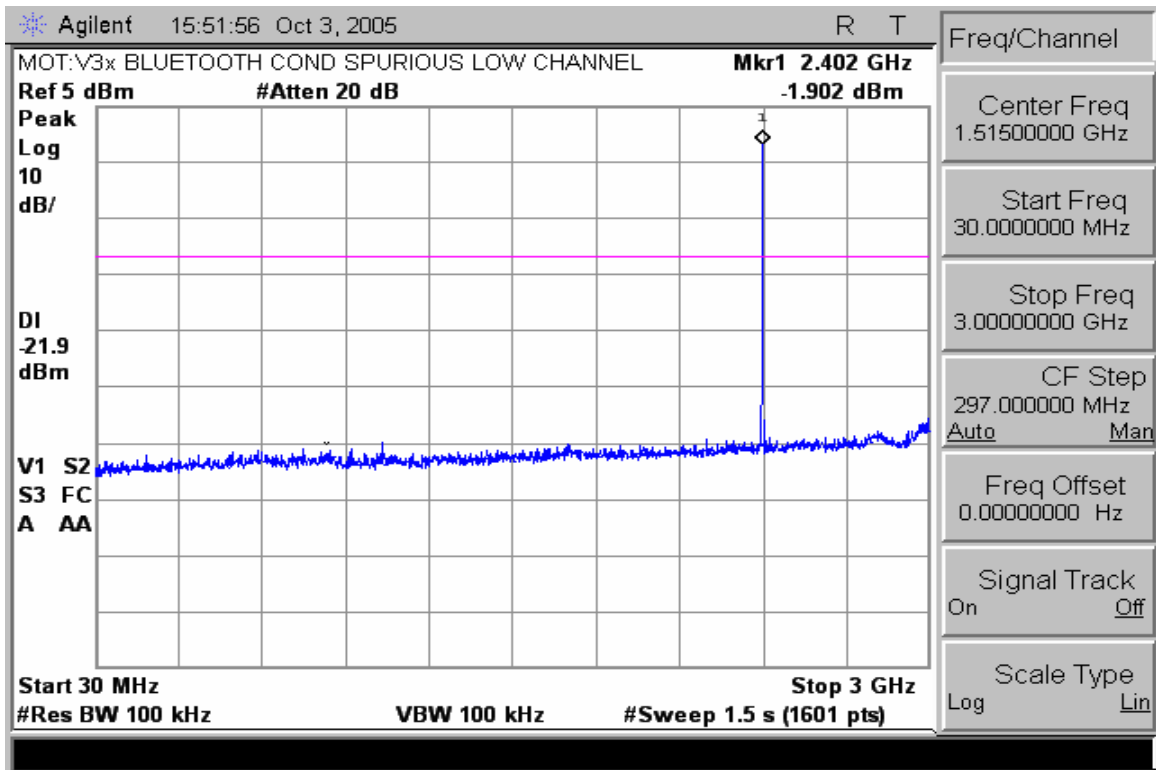
CFR 47 Part 15.247

Measurement Procedure

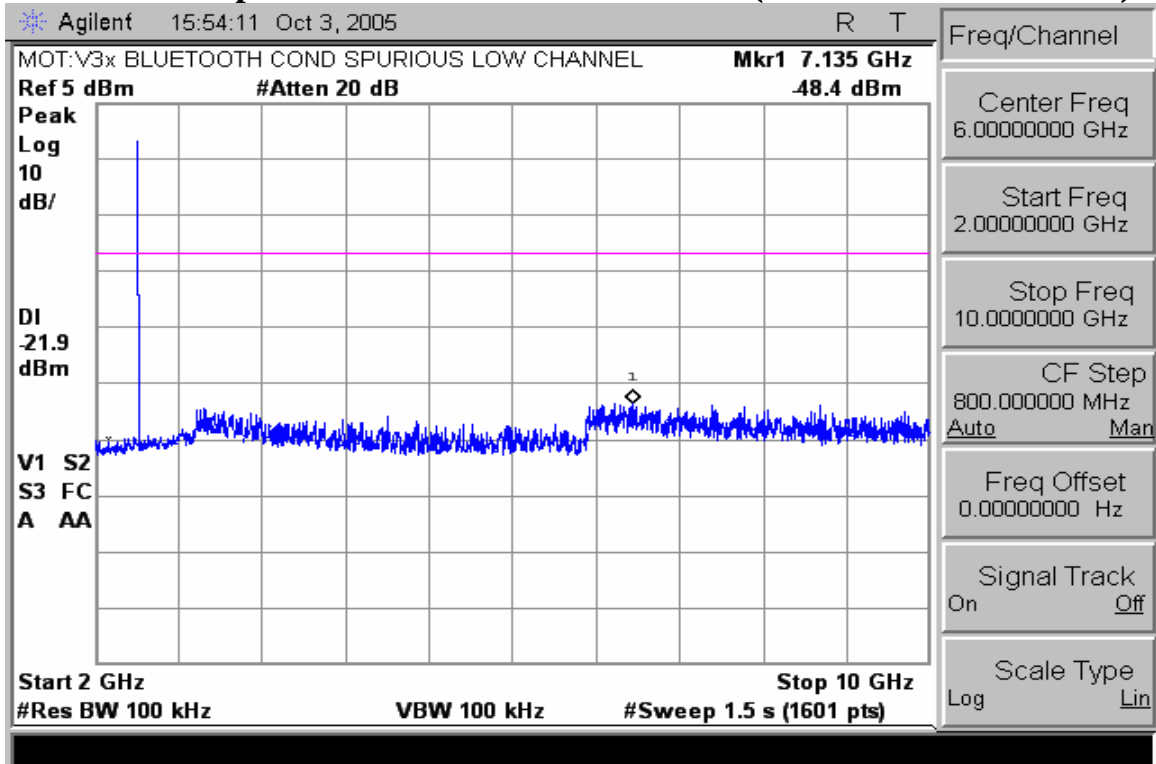
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

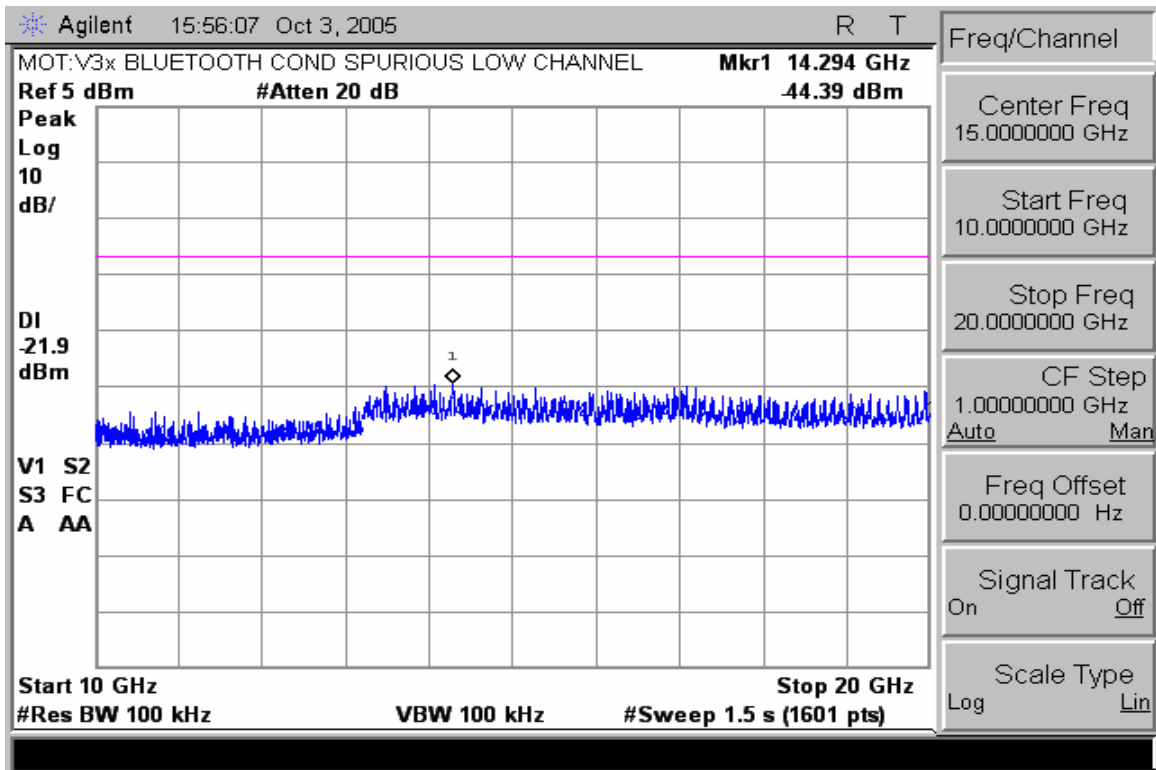
See attached:



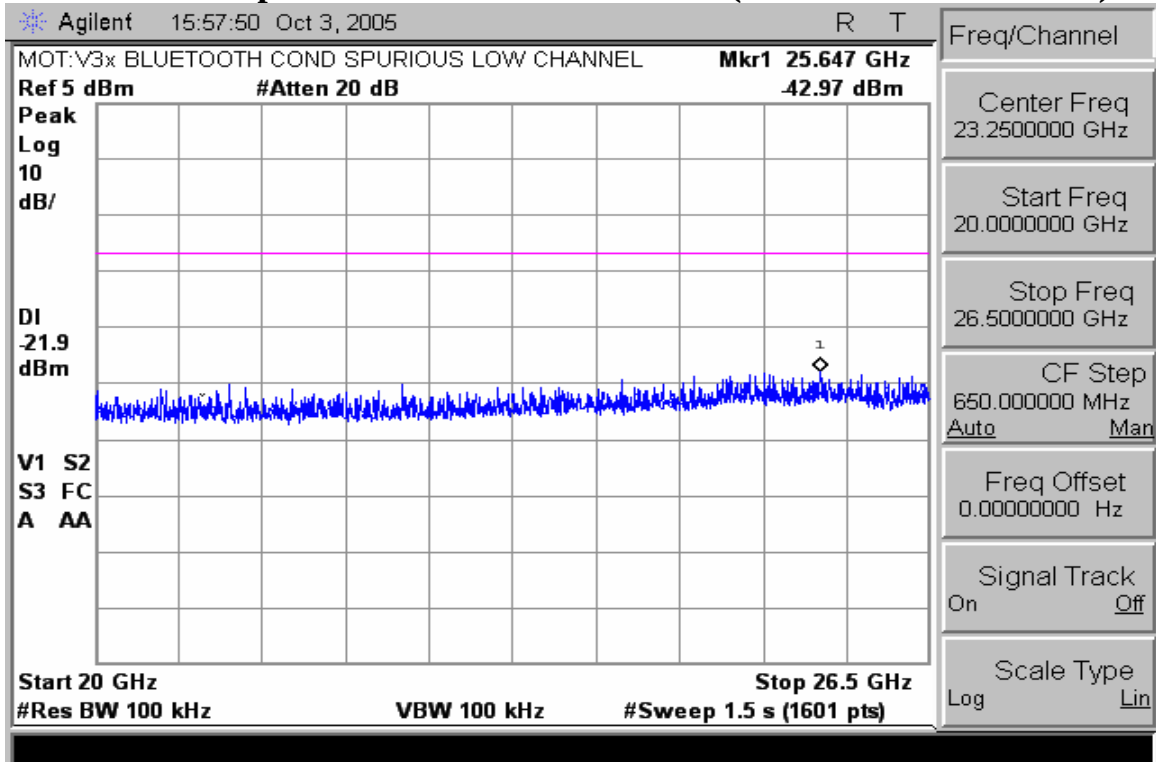
Conducted Spurious Emissions 30-3000MHz (Low Channel Enabled)



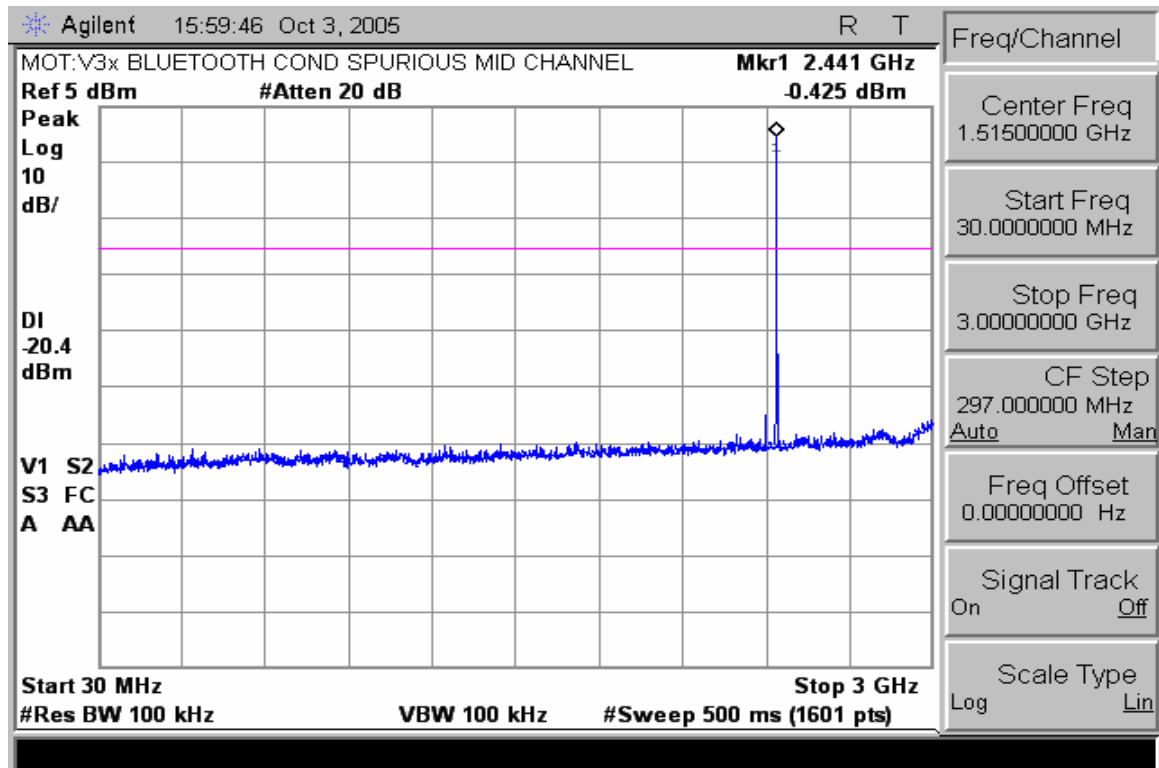
Conducted Spurious Emissions 2-10GHz (Low Channel Enabled)



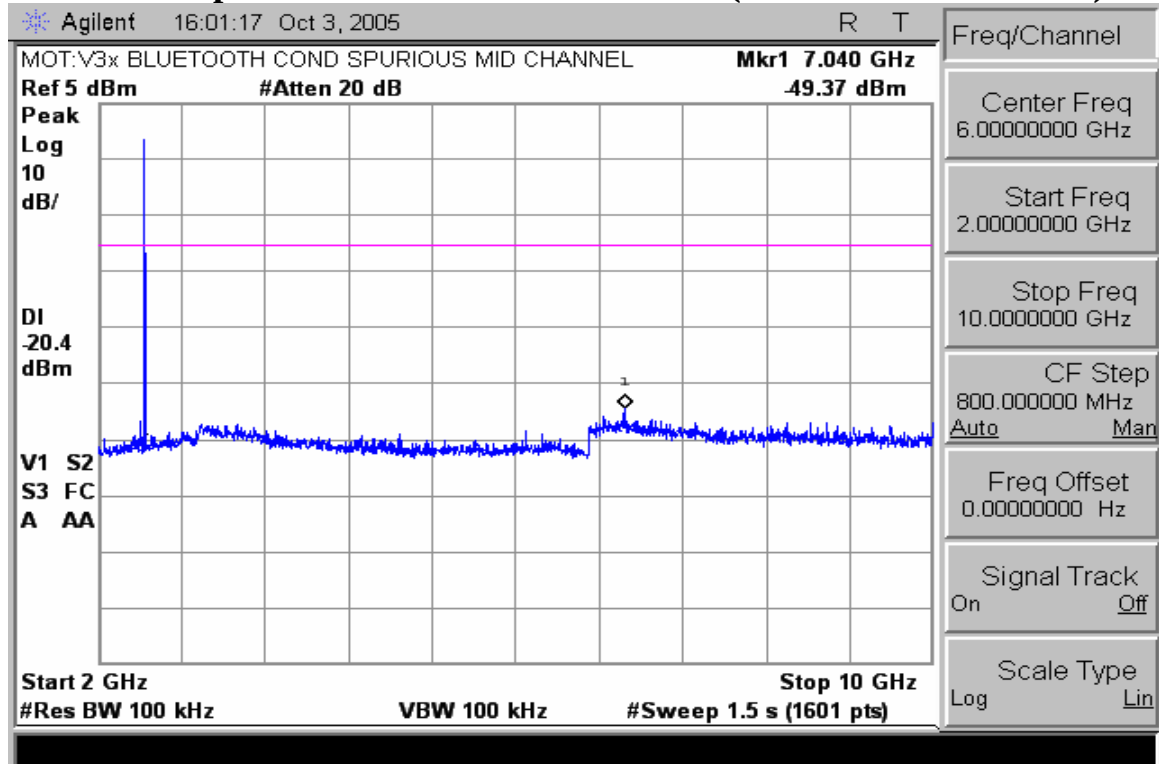
Conducted Spurious Emissions 10-20GHz (Low Channel Enabled)



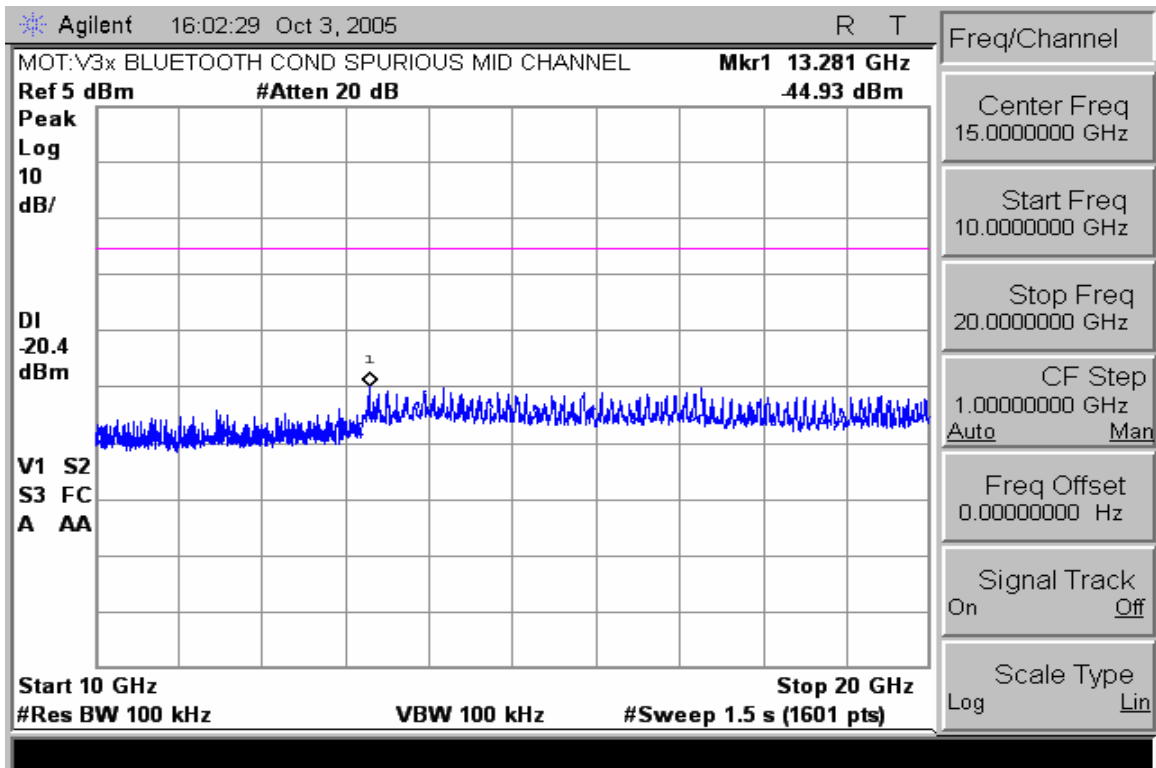
Conducted Spurious Emissions 20-26.5GHz (Low Channel Enabled)



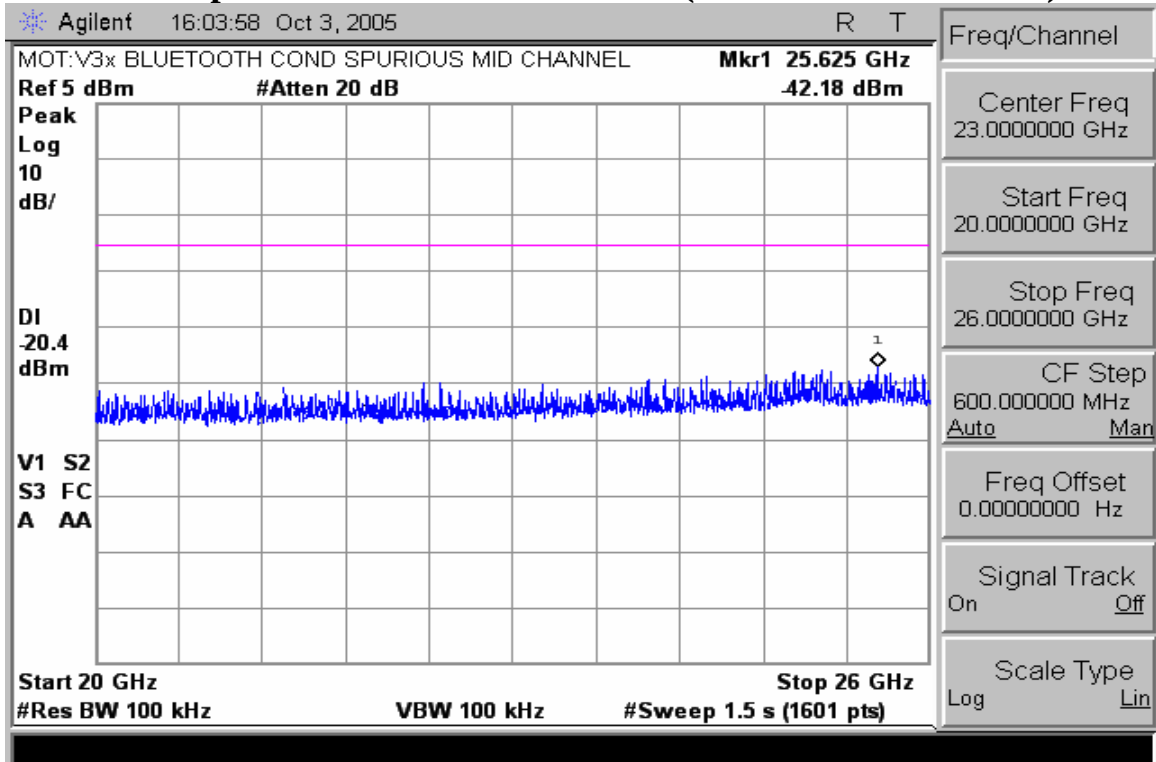
Conducted Spurious Emissions 30-3000MHz (Mid Channel Enabled)



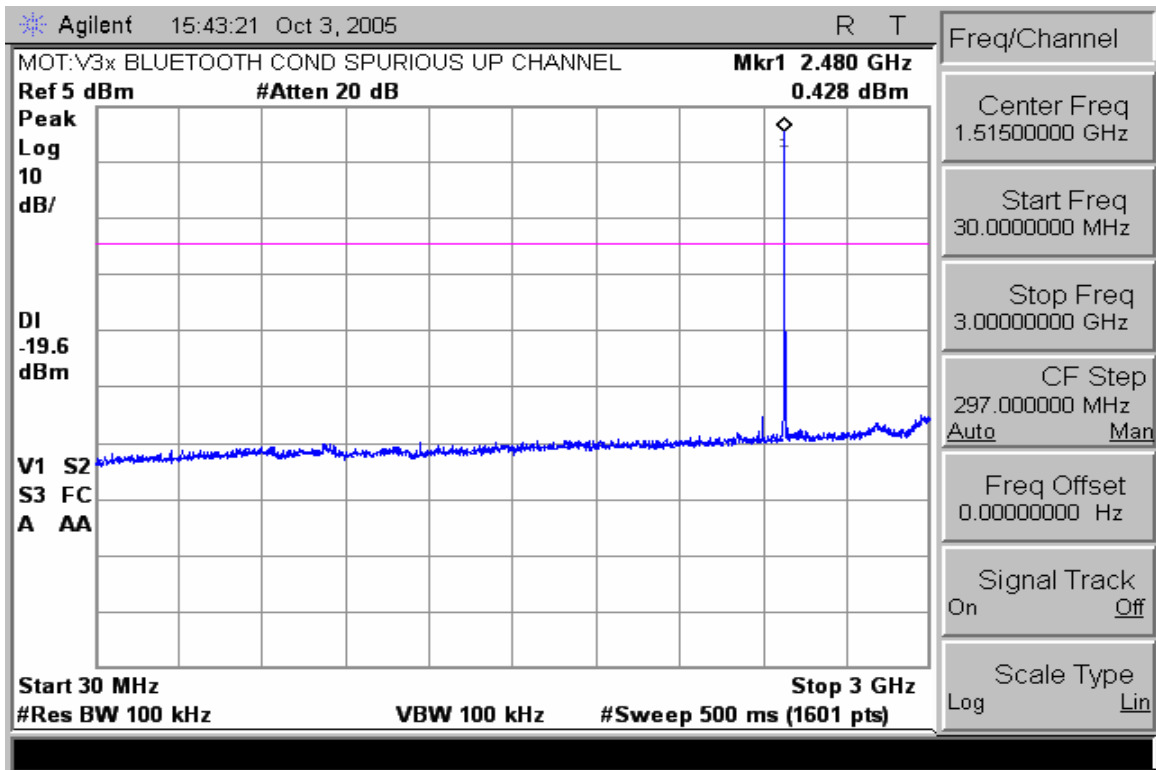
Conducted Spurious Emissions 2-10GHz (Mid Channel Enabled)



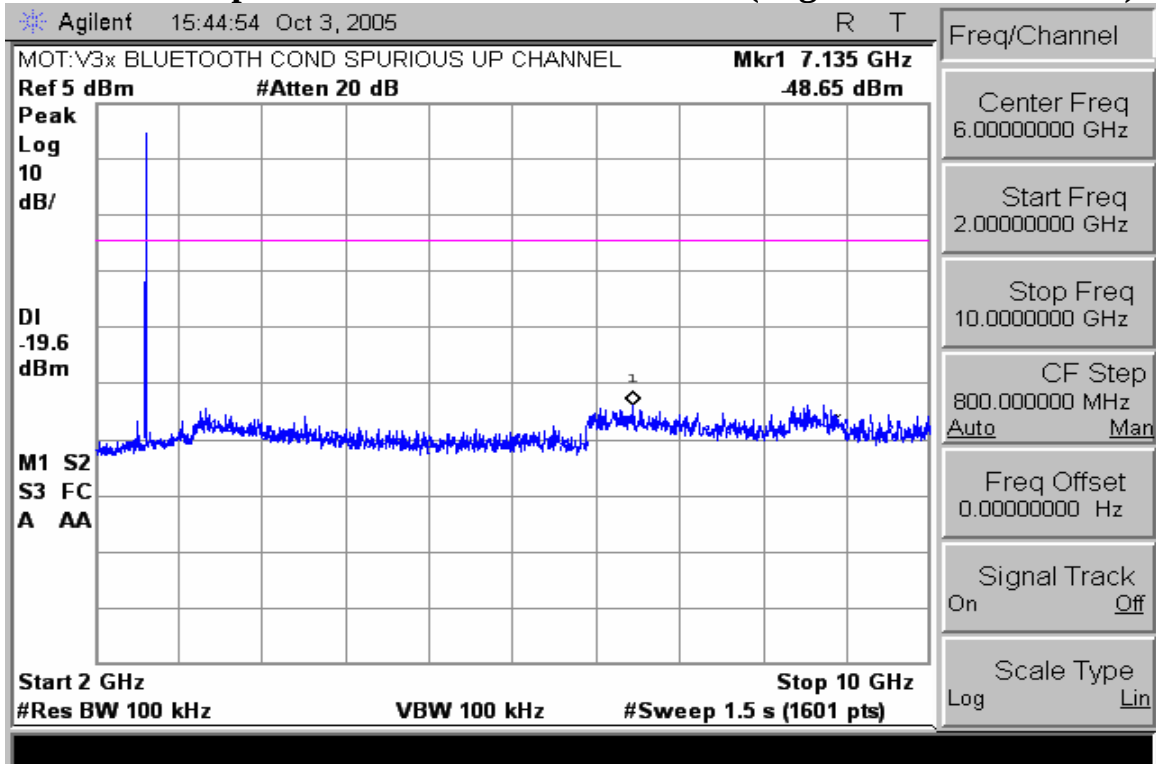
Conducted Spurious Emissions 10-20GHz (Mid Channel Enabled)



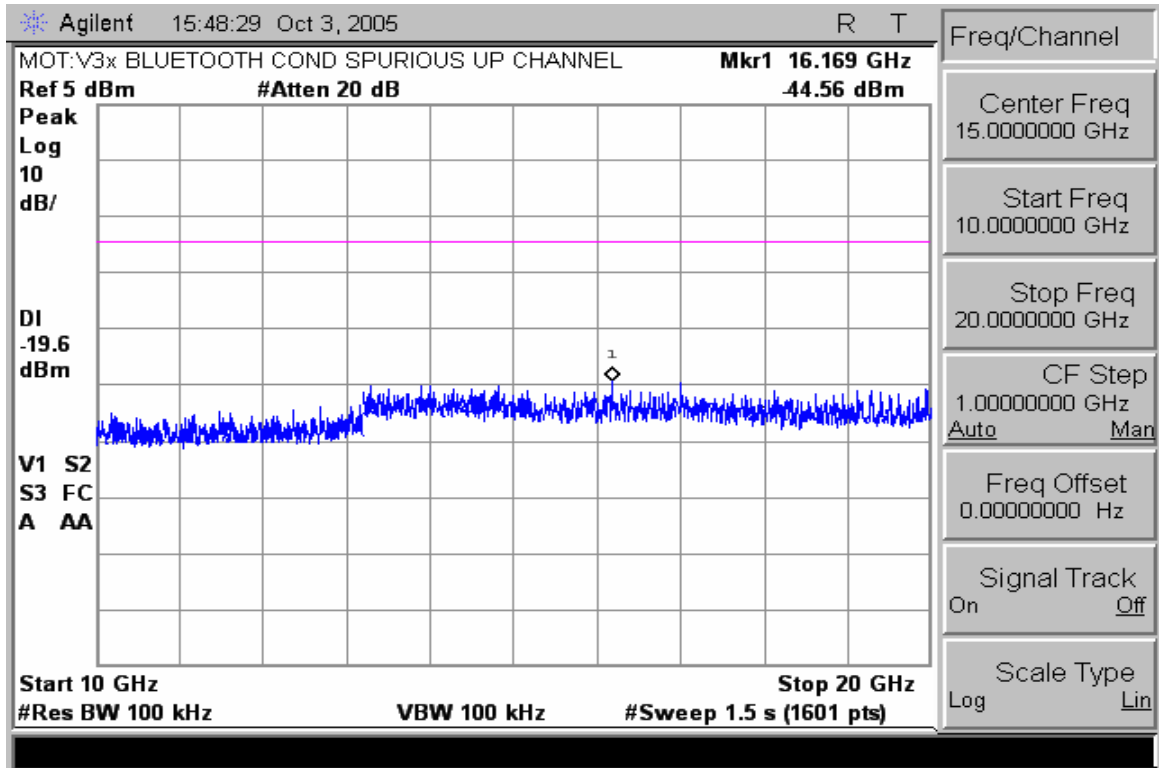
Conducted Spurious Emissions 20-26.5GHz (Mid Chan Enabled)



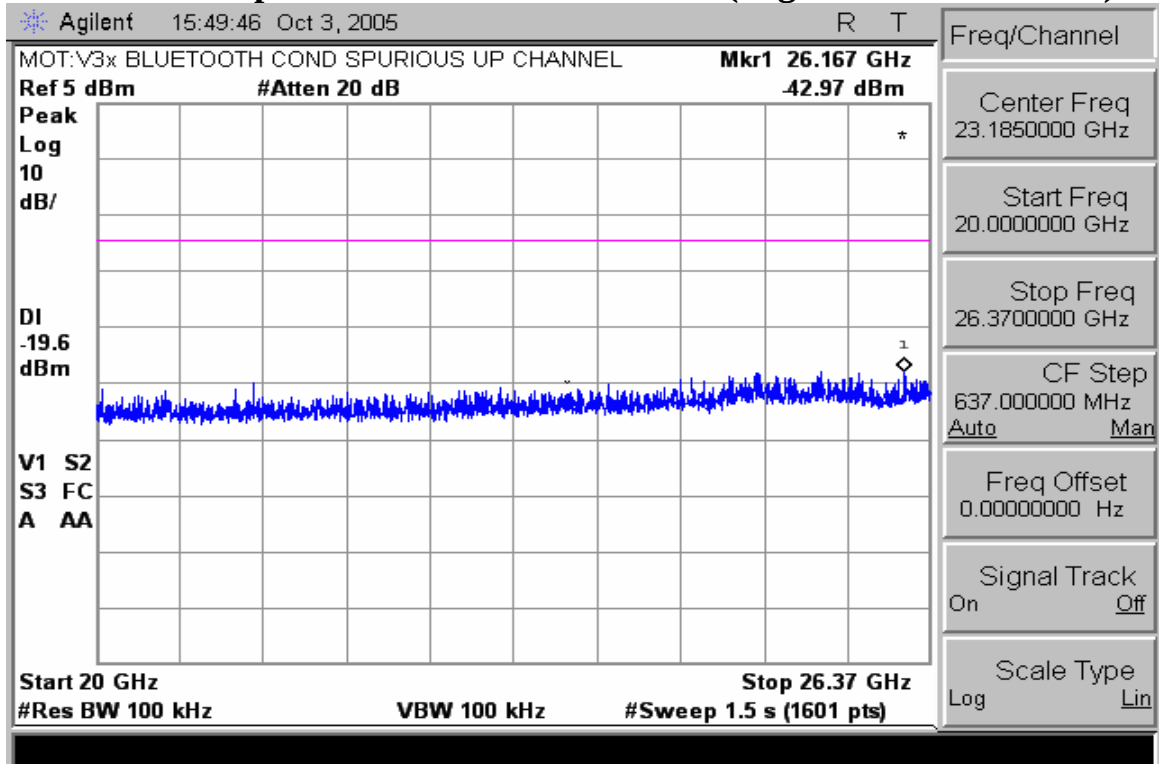
Conducted Spurious Emissions 30-3000MHz (High Channel Enabled)



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)

AC LINE CONDUCTED

CFR 47 Part 15.207

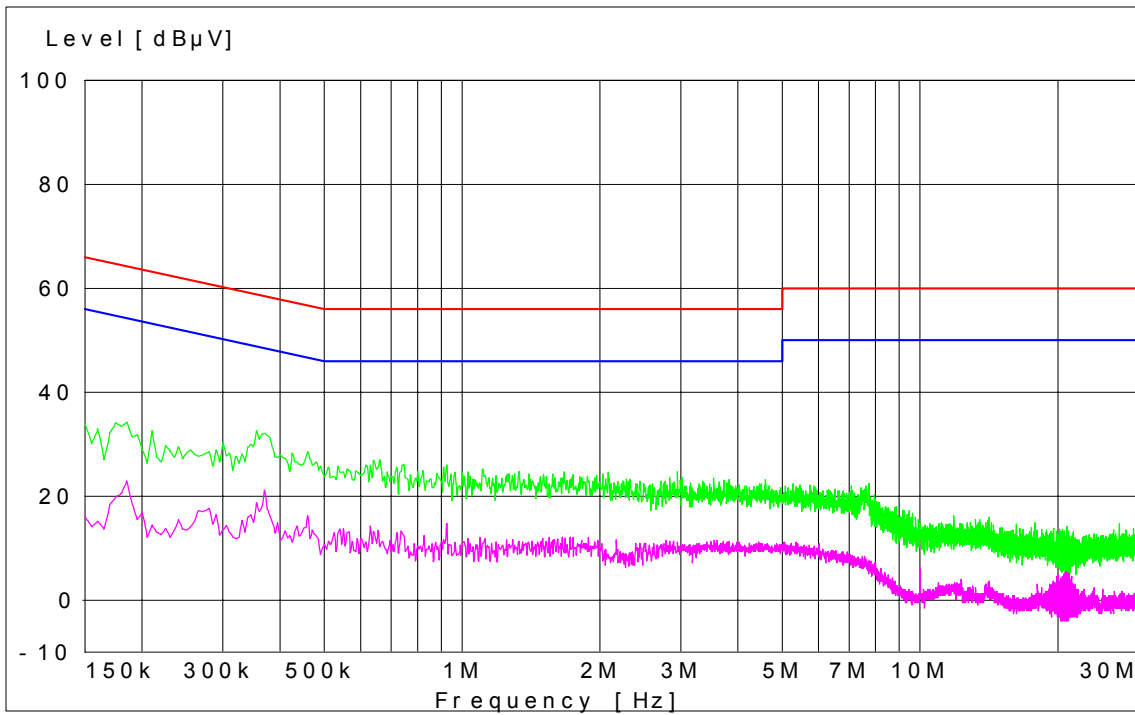
Measurement Procedure

Measured levels of ac powerline conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω noise meter, or where permitted or required, the radio-noise current on the powerline sensed by a current probe.

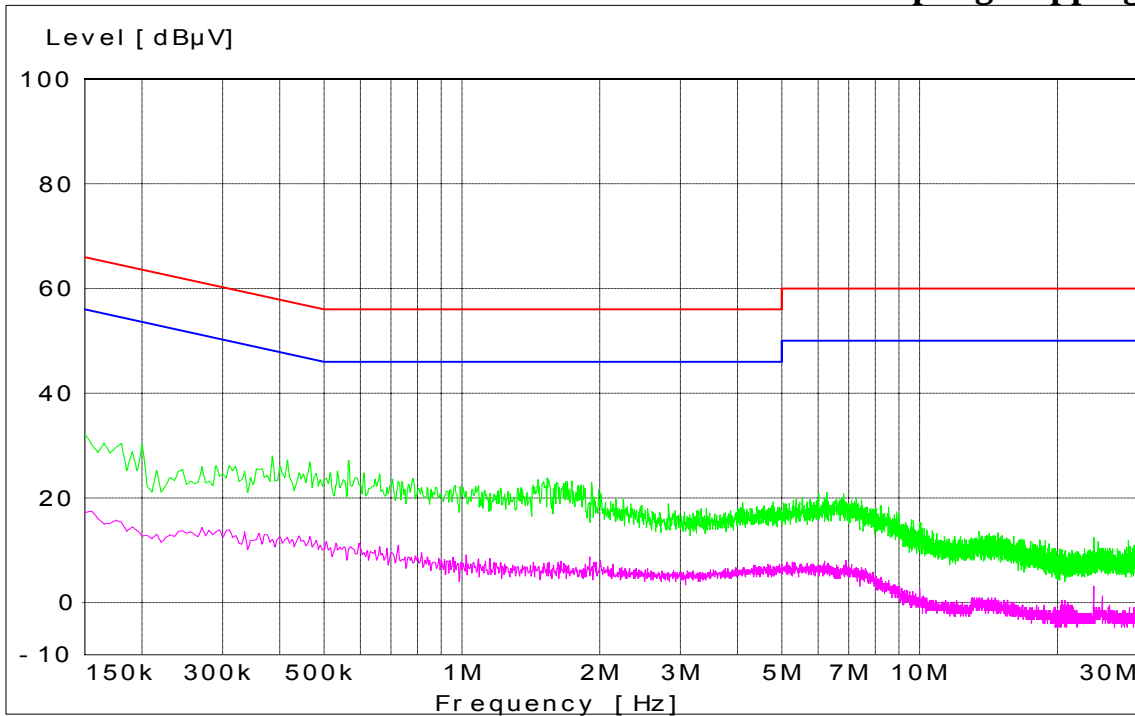
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using an LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω .

Measurement Results

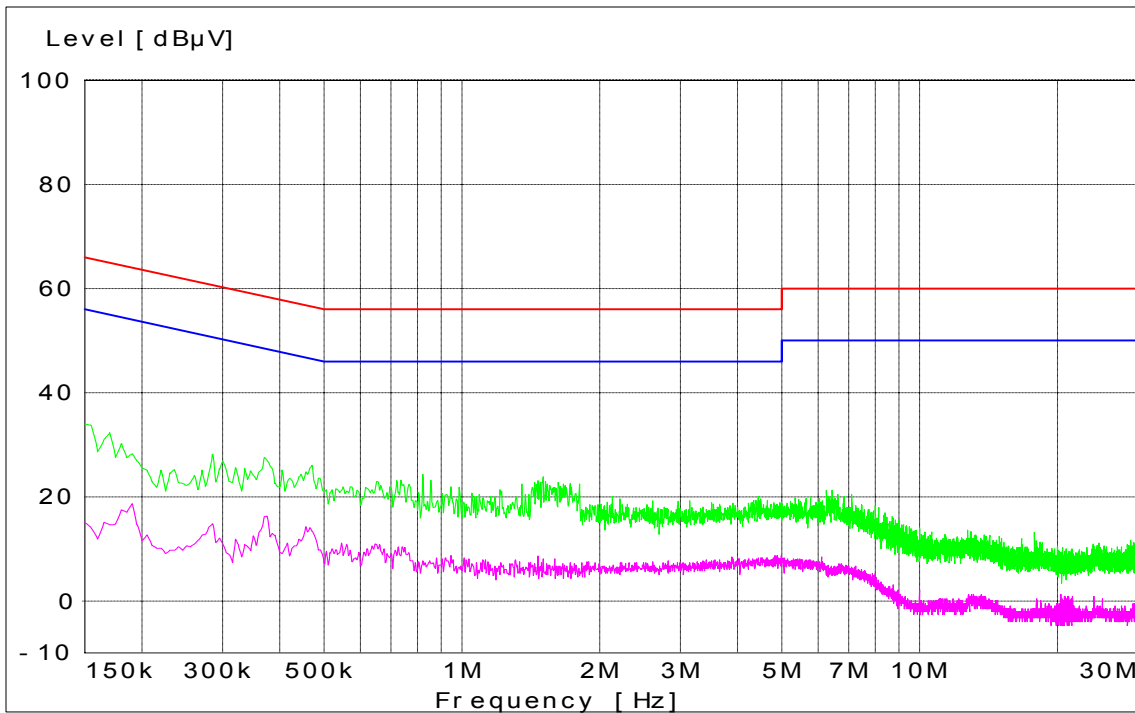
See attached:



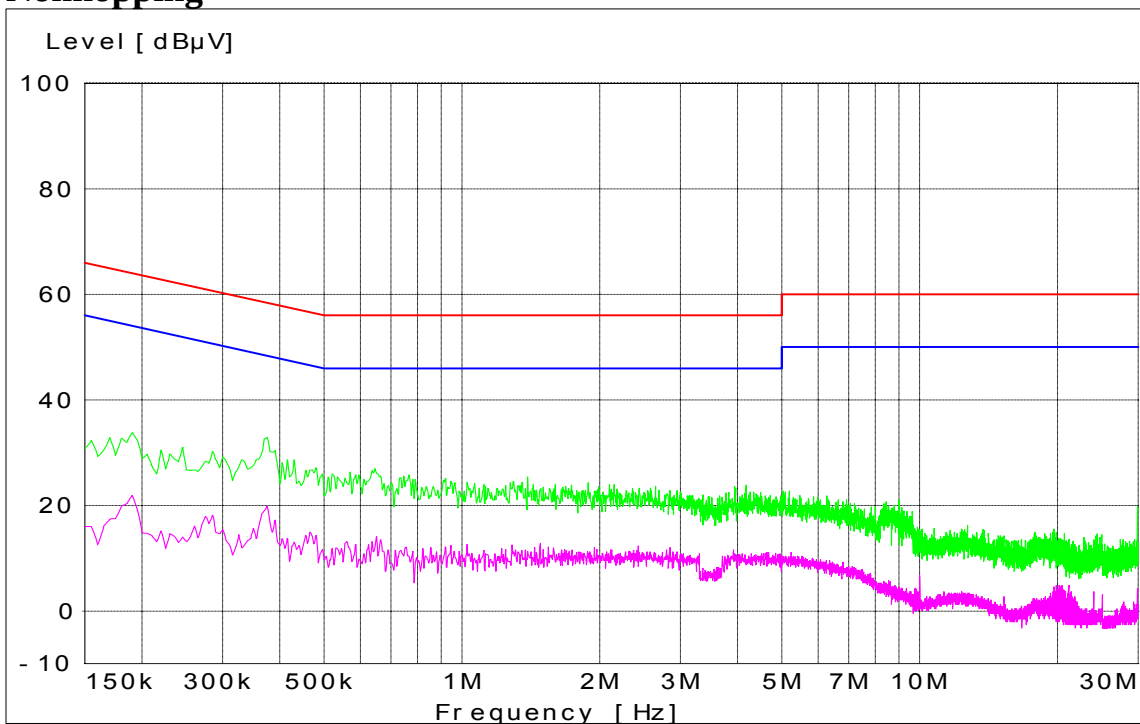
Bluetooth Channel 0 2402MHz - Tx Mode - Neutral Coupling Hopping



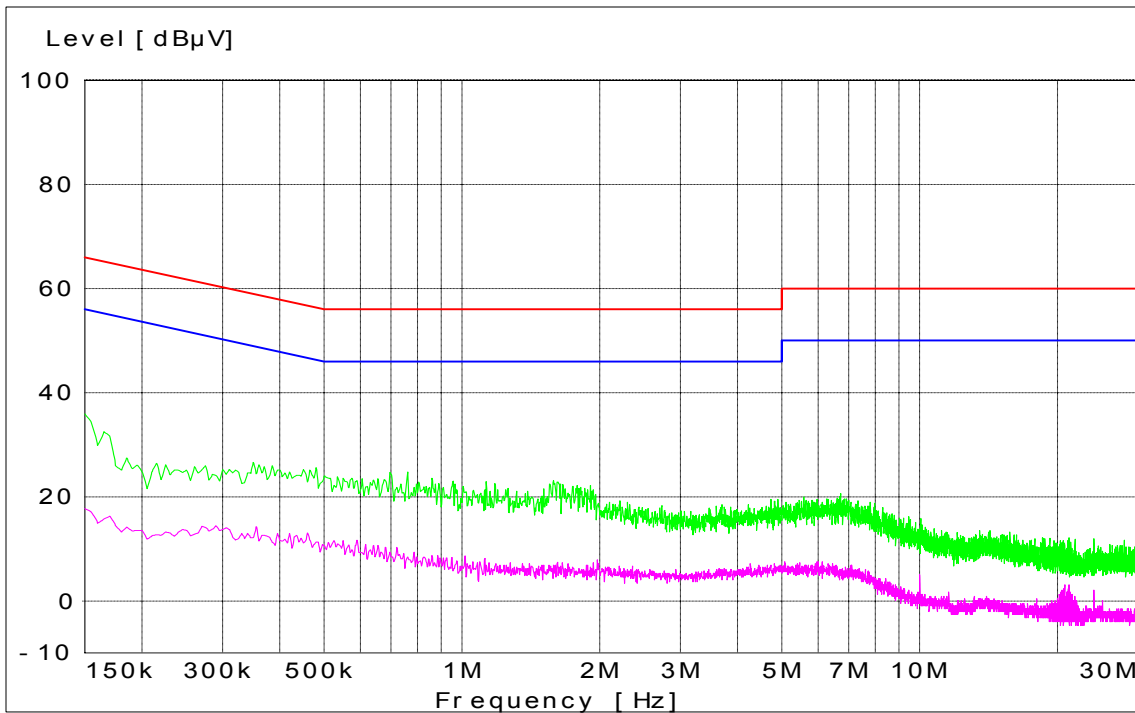
Bluetooth Channel 0 2402MHz - Tx Mode – Line Coupling Nonhopping



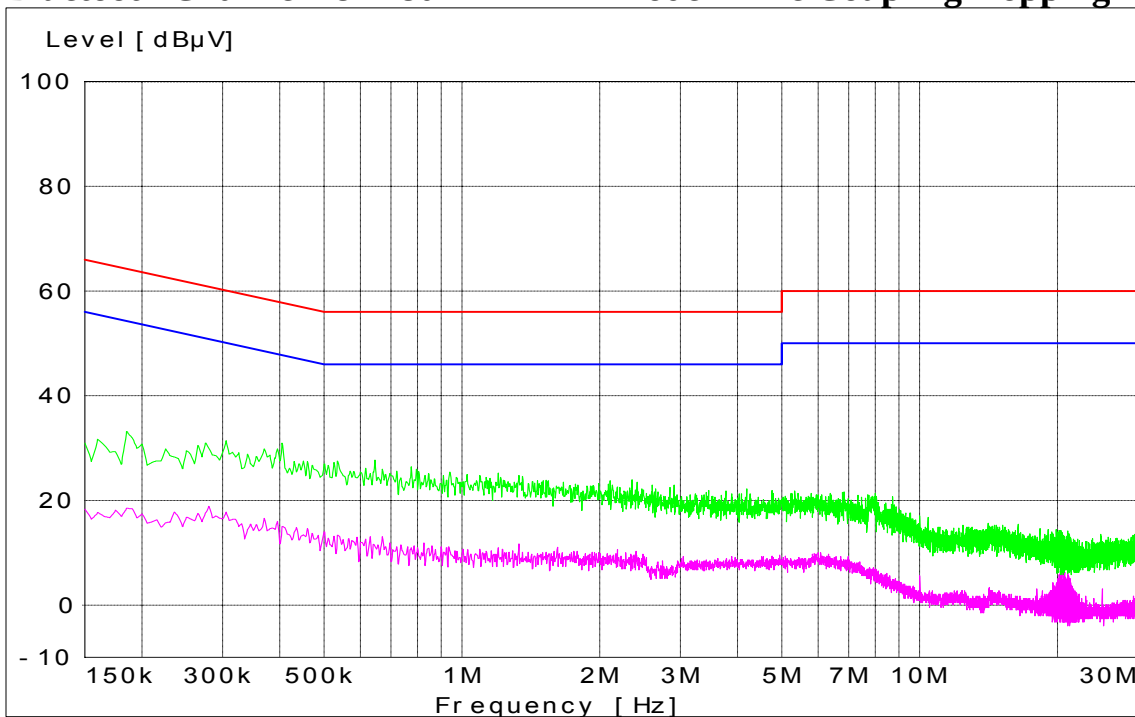
**Bluetooth Channel 39 2441MHz - Tx Mode - Line Coupling
Nonhopping**



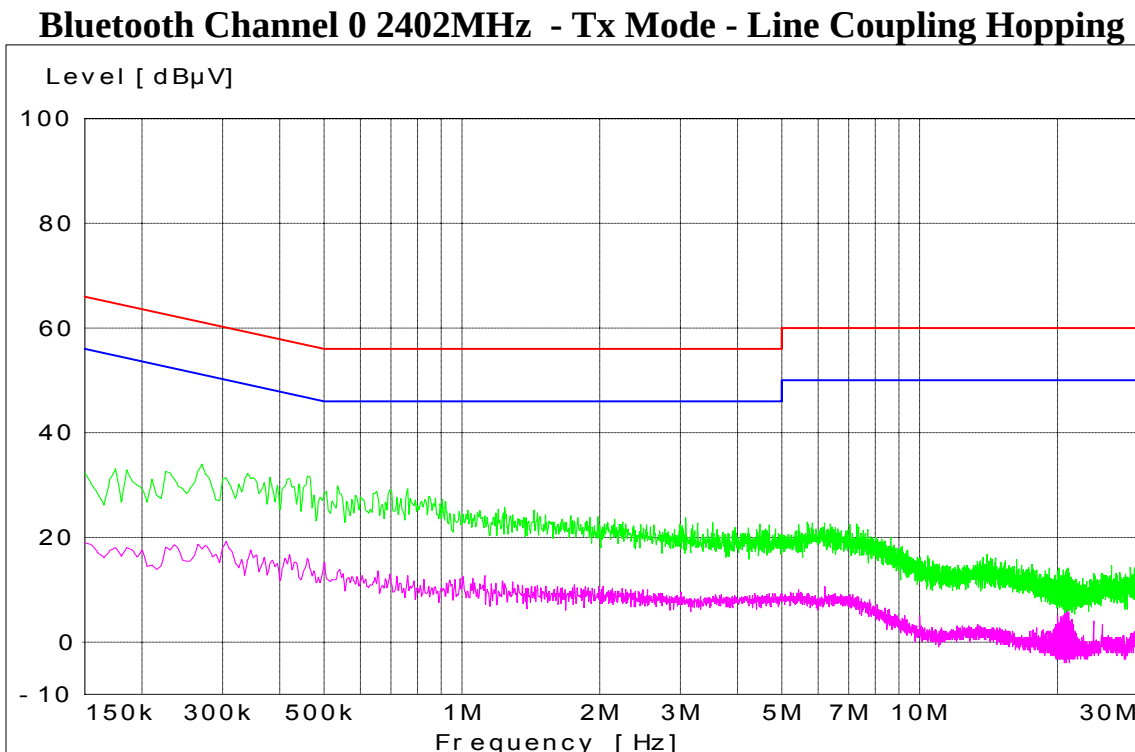
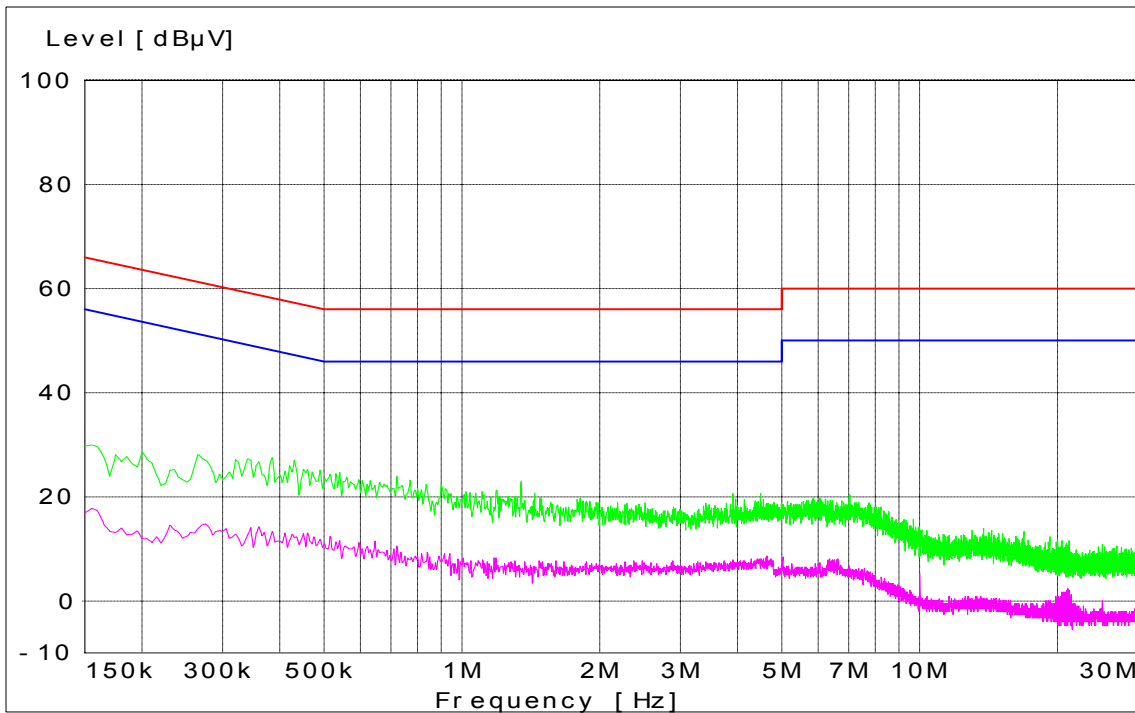
**Bluetooth Channel 39 2441MHz - Tx Mode - Neutral Coupling
Hopping**

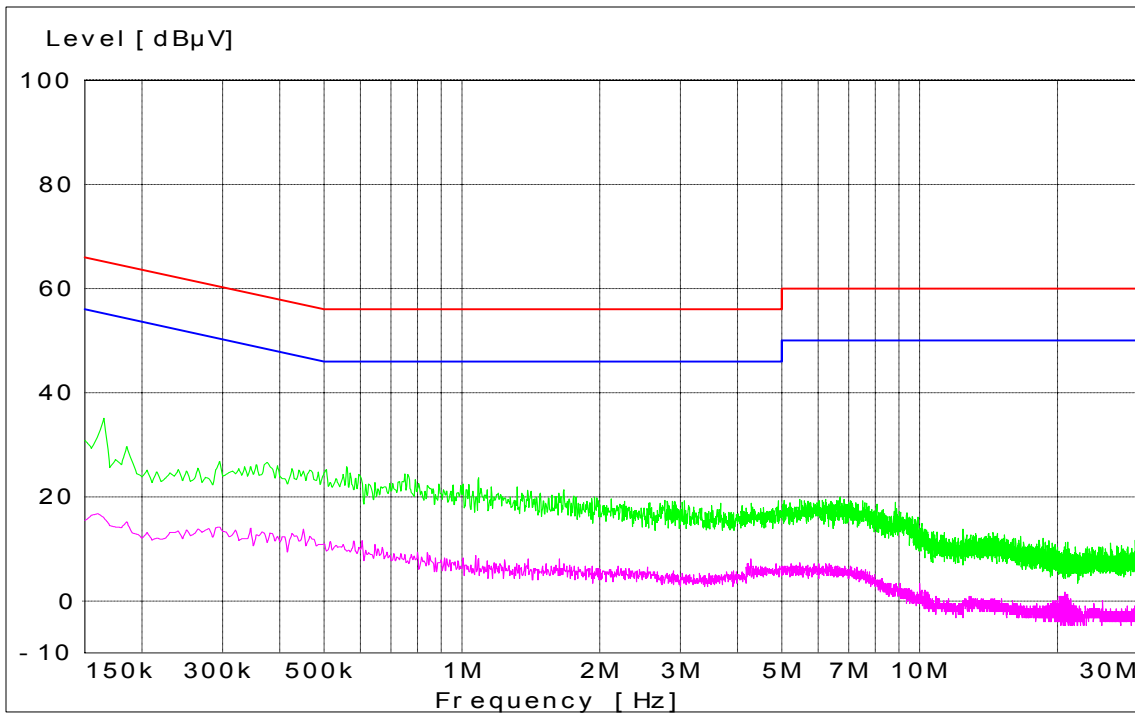


Bluetooth Channel 78 2480MHz - Tx Mode - Line Coupling Hopping

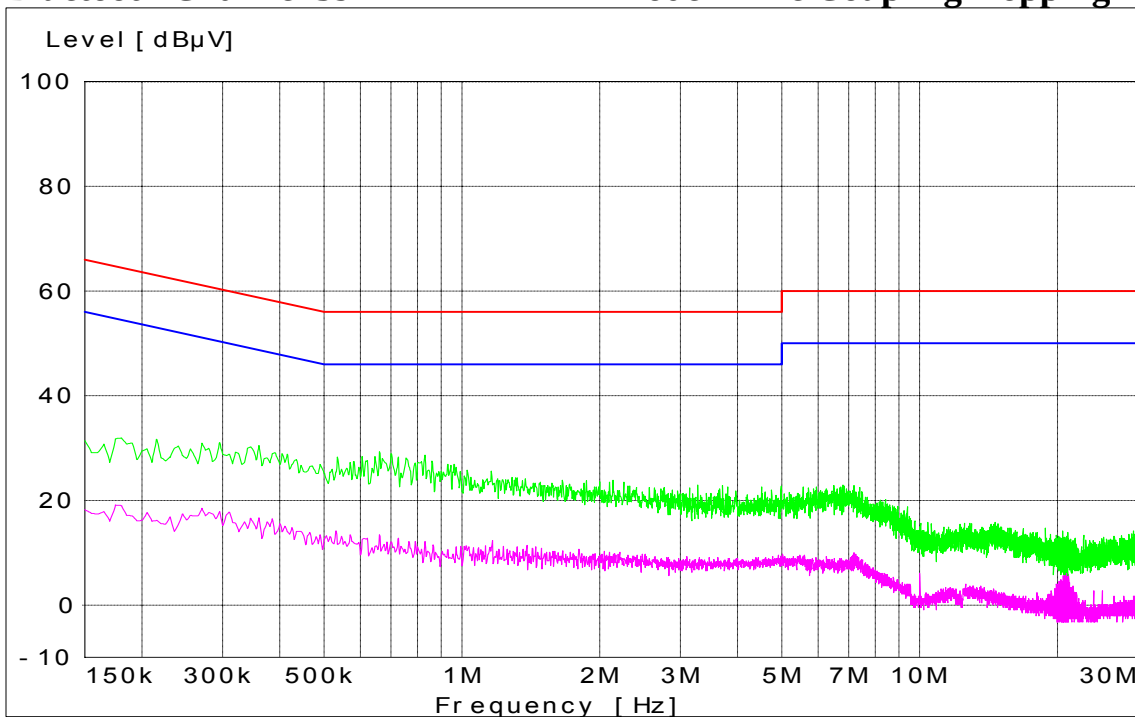


Bluetooth Channel 78 2480MHz - Tx Mode - Neutral Coupling Hopping

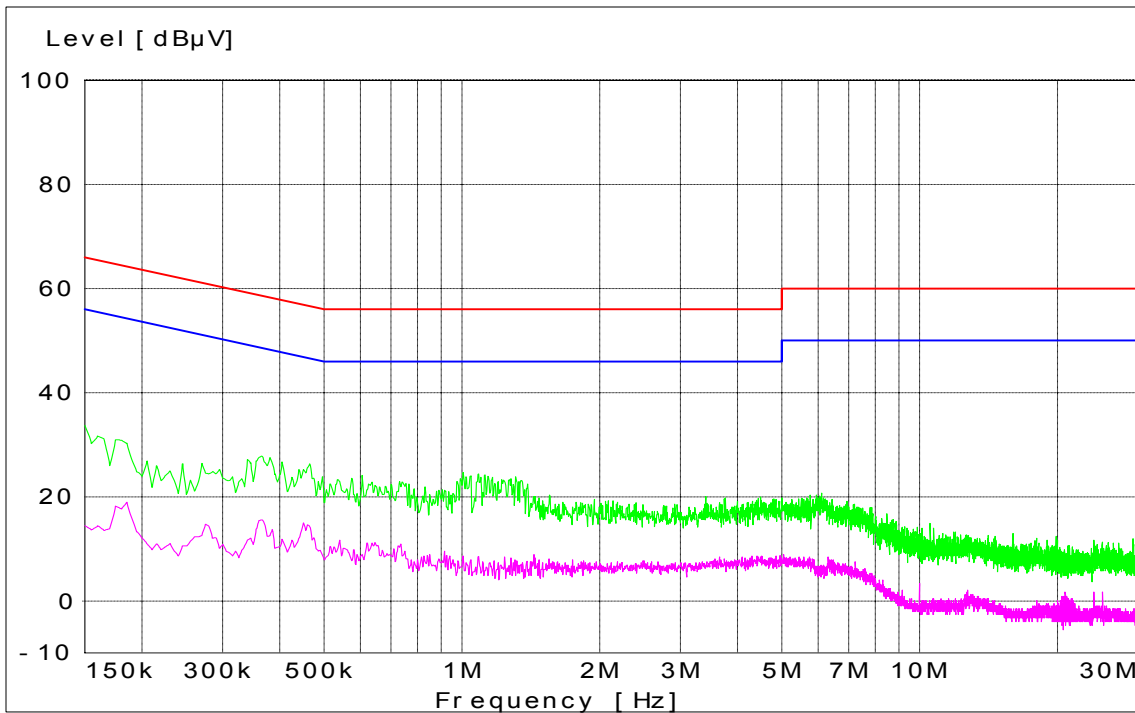




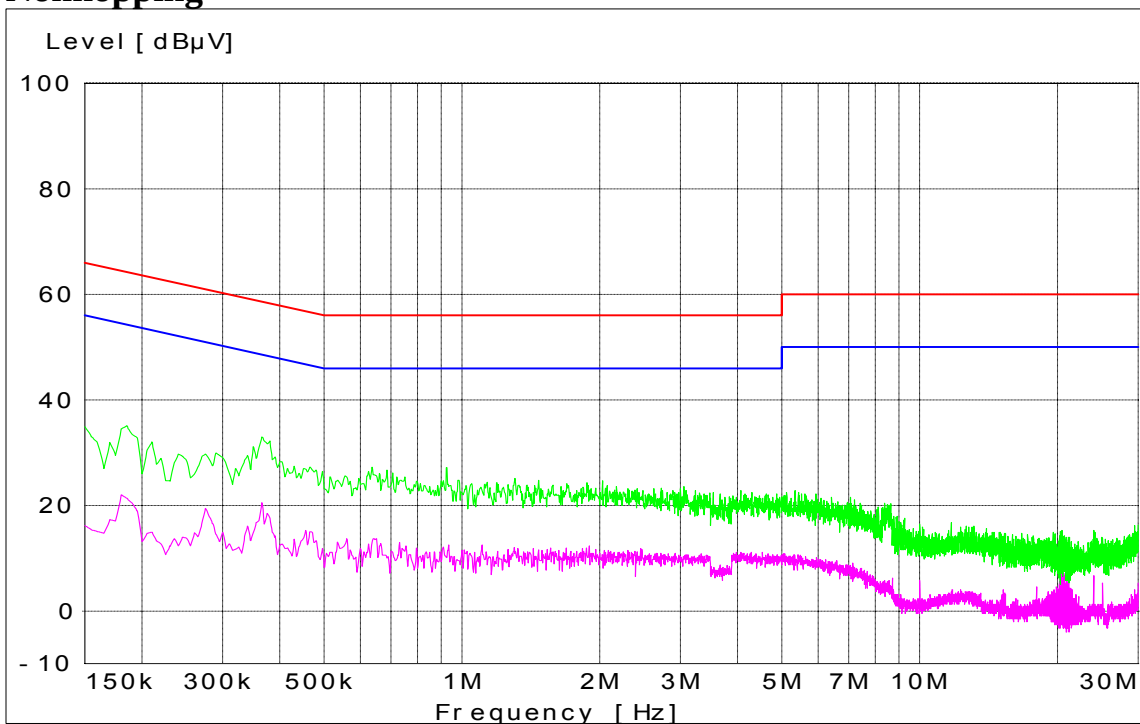
Bluetooth Channel 39 2441MHz - Tx Mode - Line Coupling Hopping



Bluetooth Channel 39 2441MHz - Tx Mode - Neutral Coupling Nonhopping



**Bluetooth Channel 78 2480MHz - Tx Mode - Line Coupling
Nonhopping**



**Bluetooth Channel 78 2480MHz - Tx Mode - Neutral Coupling
Nonhopping**

End of Test Report