



MOTOROLA

PERSONAL COMMUNICATIONS SECTOR

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT - Addendum

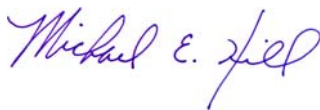
Test Report Number – 14614-2BT

Report Date – August 4, 2004

Revised: September 20, 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: 

Name: Michael E. Hill

Title: Senior Electrical Engineer

Date: 2004-08-04

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THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY A2LA OR ANY AGENCY OF THE U.S. GOVERNMENT.

A2LA Certificate Number: 1846-01



Table of Contents

Test Report Details	3
Applicable Standards	4
Summary of Testing.....	5
General and Special Conditions.....	5
Equipment and Cable Configurations.....	6
Measuring Equipment and Calibration Information	6
Description of Bluetooth Transmitter	7
Measurement Procedures and Data.....	8
CARRIER FREQUENCY SEPARATION	8
Measurement Procedure.....	8
Measurement Results	8
NUMBER OF HOPPING FREQUENCIES	10
Measurement Procedure.....	10
Measurement Results	10
TIME OF OCCUPANCY (DWEEL TIME).....	12
Measurement Procedure.....	12
Measurement Results	12
20dB Bandwidth	14
Measurement Procedure.....	14
Measurement Results	14
20 dB Bandwidth	15
FIELD STRENGTH OF SPURIOUS EMISSIONS.....	16
Measurement Procedure.....	16
Measurement Results	16
PEAK OUTPUT POWER	46
Measurement Procedure.....	46
Measurement Results	46
BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS	47
Measurement Procedure.....	47
Measurement Results	47
SPURIOUS RF CONDUCTED EMISSIONS	50
Measurement Procedure.....	50
Measurement Results	50

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: Bluetooth

Model Number: A630

Serial Numbers: 004400-00-383352-0, 004400-00-383352-0

Testing Complete Date: February 2, 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:

- ☒ 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	Pass
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)	120.6 μ s
4	20 dB Bandwidth	765 KHz
5	Spurious RF Conducted Emissions	See plots
6	Field Strength of Spurious Emissions	See plots
7	Max Power	0.718dBm
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

Manufacturer Name	Item Name Description	Model #	Serial Number	Calibration Due Date
HP	GSM Test Set	8922M	3639U01033	05/04/2004
HP	DCS/PCS MS Test Set	83220E	3524U01522	05/22/2004
Agilent	Power Supply	66311B	US38447252	10/24/2004
HP	EMC Analyzer	E7405	US40240219	04/04/2004
Weinschel	10dB Attenuator	AS-6	6675	10/14/2004
Gigatronics	Universal Power Meter	8651A	8650508	10/02/2004
KWM	1900MHz HP Filter	HPF-L-14768	8427-01	10/02/2004
KWM	800MHz HP Filter	HPF-L-14767	8427-02	08/15/2004
Thermotron	Environmental Chamber	S-4	31580	01/05/2005
Rohde Schwarz	EMI Test Receiver	ESI26	838786/010	04/29/2004
A.H. System	Horn Antenna	SAS200/571	365	12/17/2004
A.H. System	Horn Antenna	SAS200/571	265	04/29/2004
ETS	Log-Periodic Antenna	3148	1189	04/29/2004
ETS	Biconical Antenna	3110B	3369	04/29/2004
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

All equipment is on a one-year calibration cycle.

Description of Bluetooth Transmitter

The A630 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.

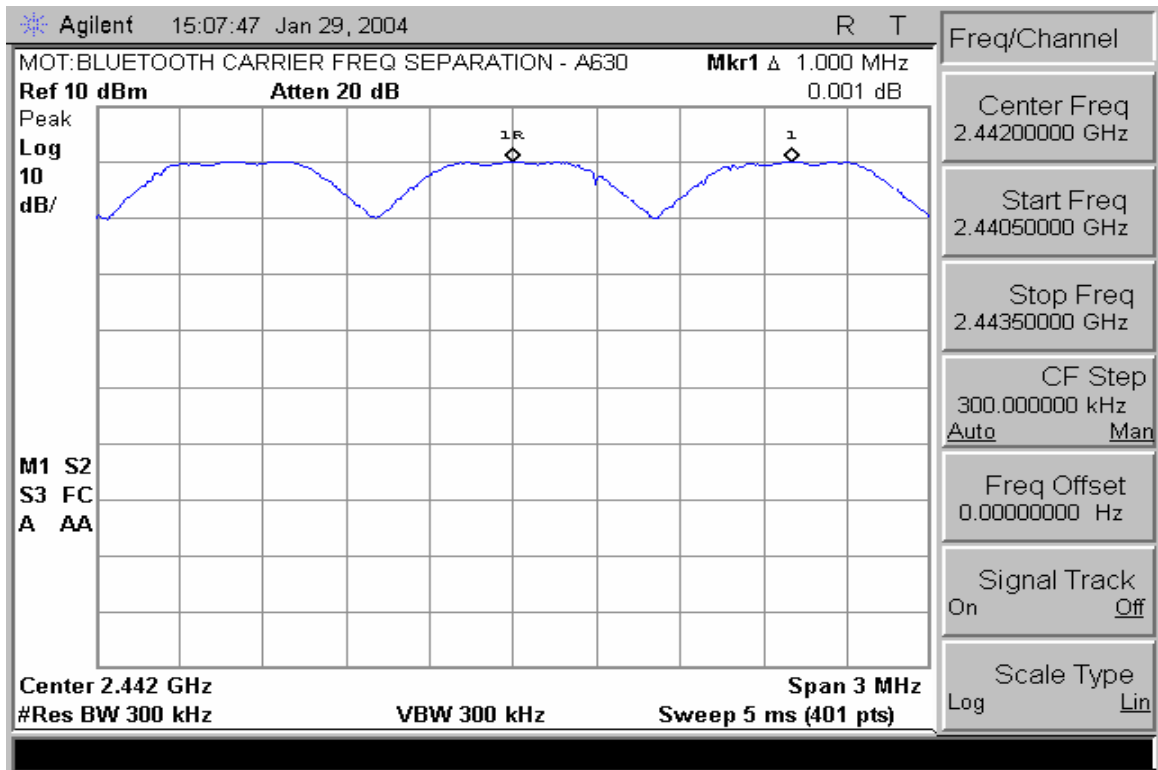
The Bluetooth transmitter of the A630 had its hopping function enabled. The following spectrum analyzer settings were used:

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.

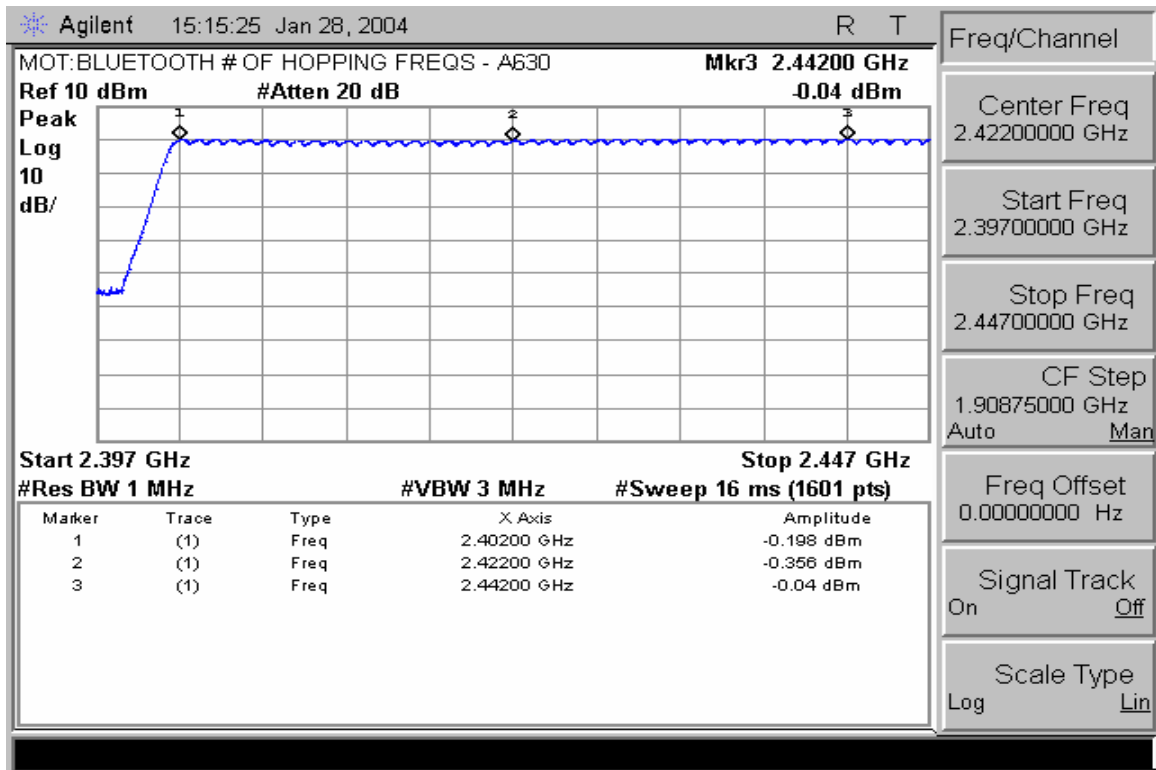
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

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

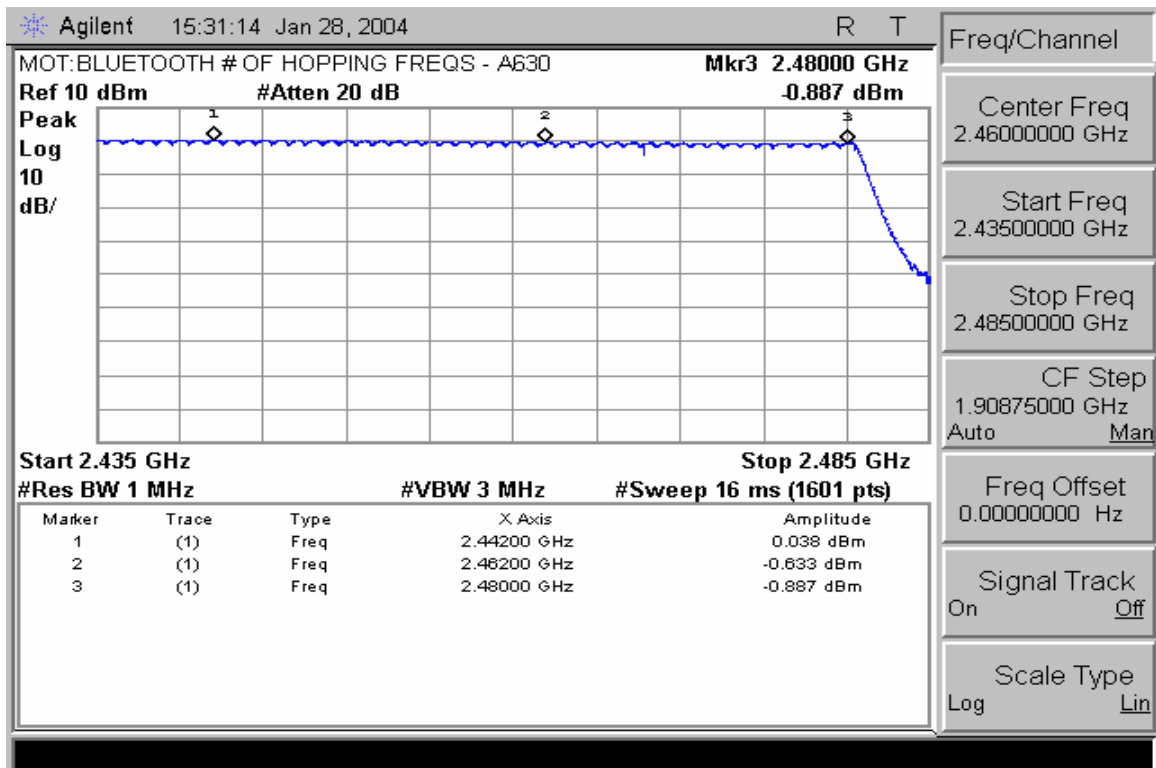
The trace was allowed to stabilize.

Measurement Results

See attached.



Number of Hopping Frequencies (Channels 2 – 42)



Number of Hopping Frequencies (Channels 42 – 80)

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.

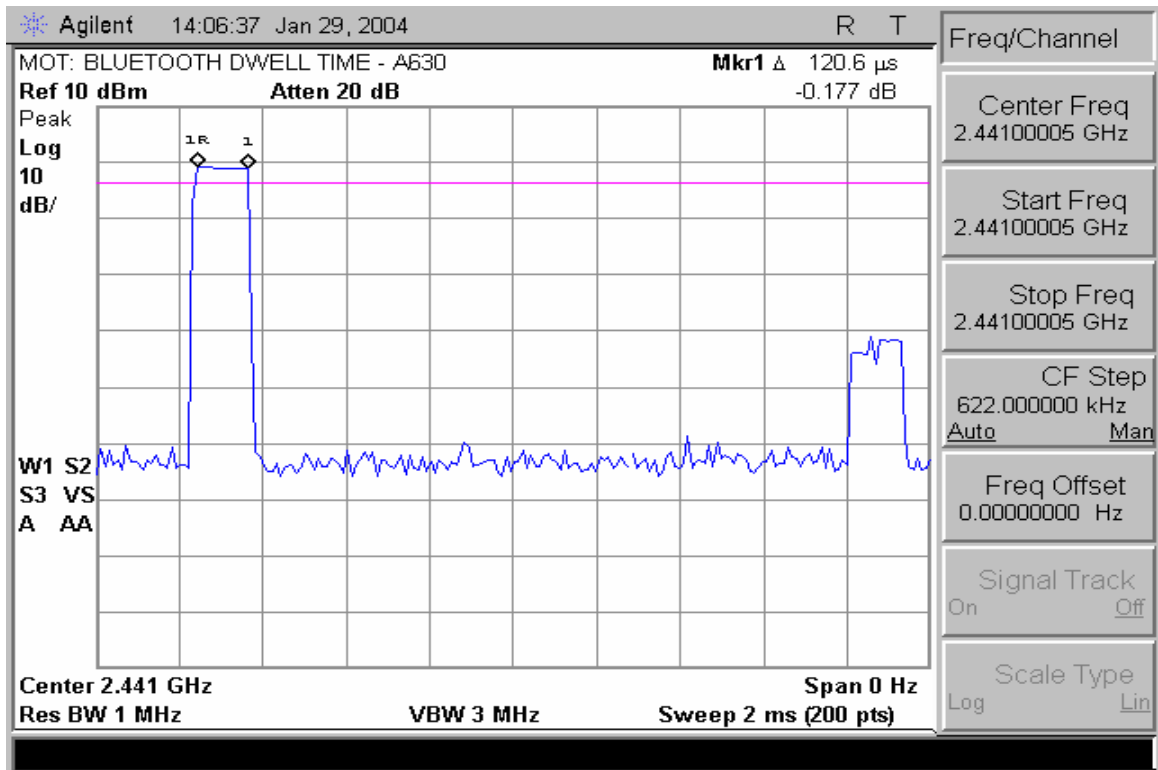
The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

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.

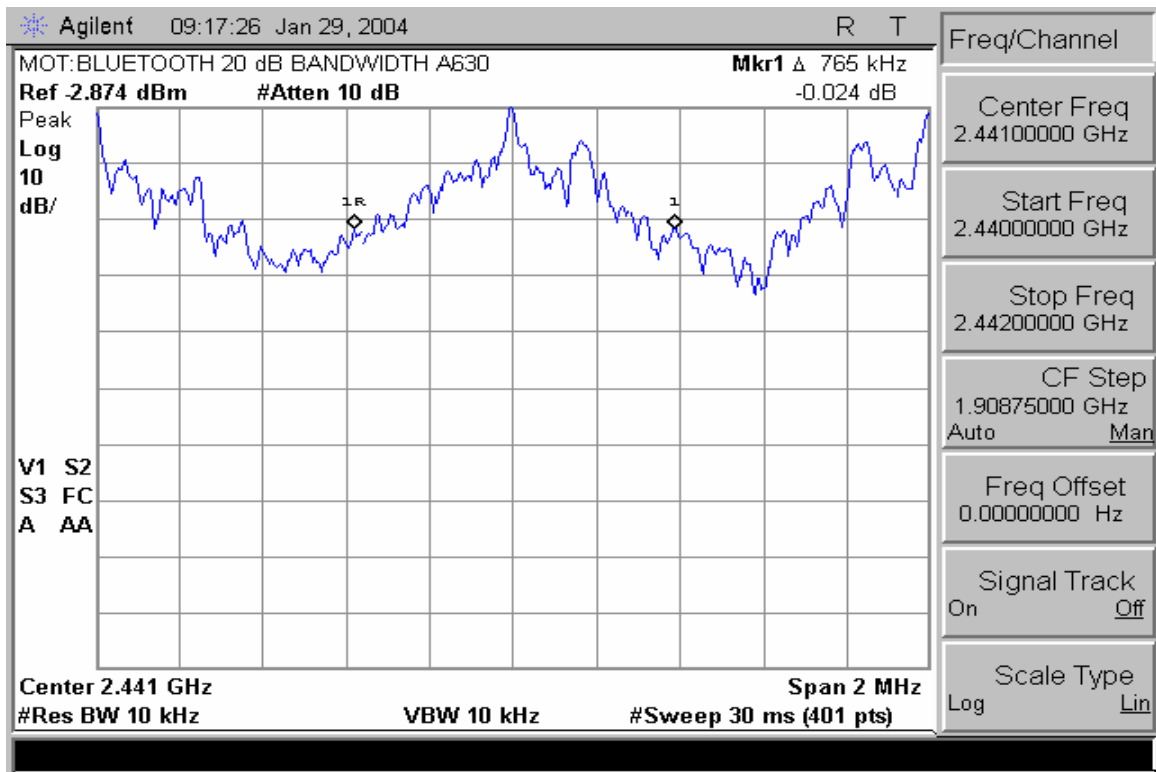
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

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



20 dB Bandwidth

FIELD STRENGTH OF SPURIOUS EMISSIONS

CFR 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

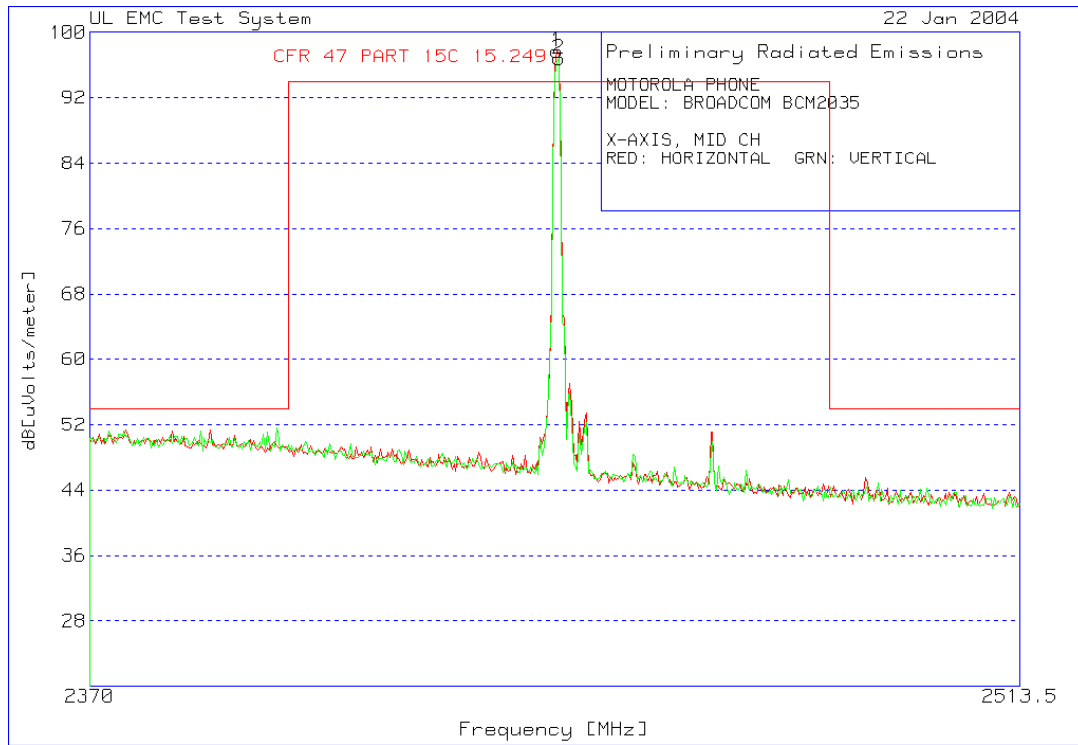


Band Edge X-Axis Low Channel

MOTOROLA PHONE
MODEL: BROADCOM BCM2035
X-AXIS, LO CH
RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2401.921	95.45	pk	-30.4	28.8	93.85	999	-905.15	200	Horz
Vertical 2370 - 2513.5MHz										
2	2401.921	95.2	pk	-30.4	28.8	93.6	999	-905.4	150	Vert

LIMIT 1: CFR 47 PART 15C Bluetooth
LIMIT 2: NONE



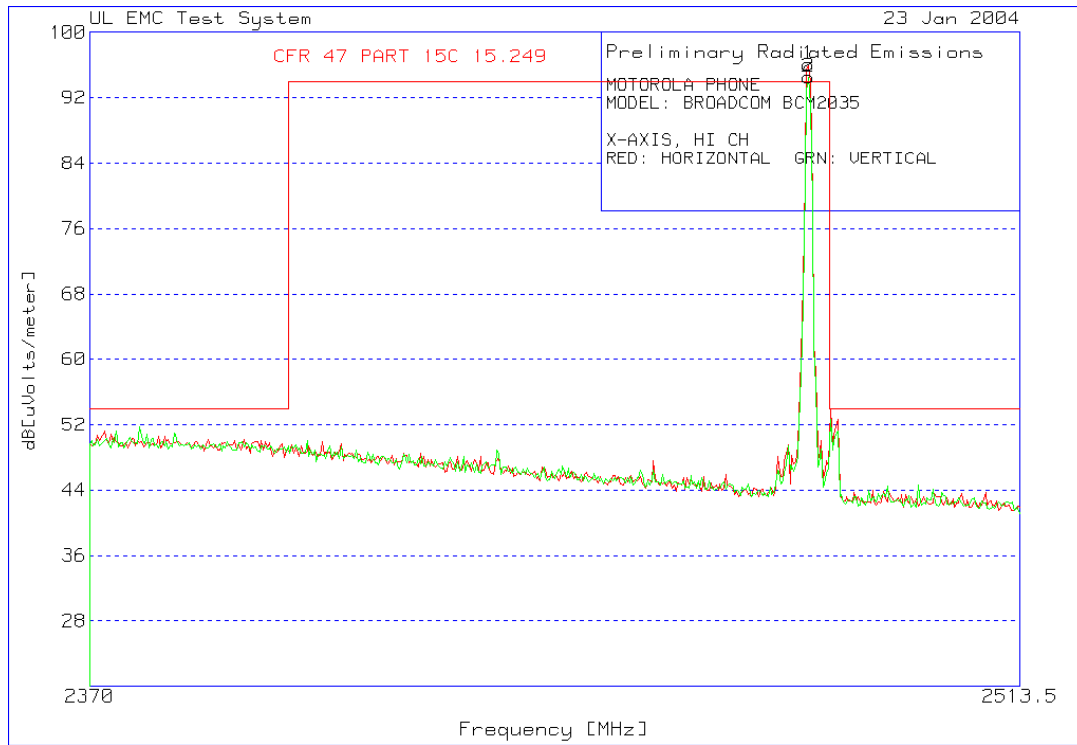
Band Edge X-Axis Middle Channel

MOTOROLA PHONE
MODEL: BROADCOM BCM2035
X-AXIS, MID CH

RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2441.031	102.2	pk	-33.3	28.8	97.7	999	-901.3	200	Horz
Vertical 2370 - 2513.5MHz										
2	2441.319	101.38	pk	-33.4	28.8	96.78	999	-902.22	150	Vert

LIMIT 1: CFR 47 PART 15C Bluetooth
LIMIT 2: NONE



Band Edge X-Axis High Channel

MOTOROLA PHONE

MODEL: BROADCOM BCM2035

X-AXIS, HI CH

RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2480.141	103.08 pk		-35.9	28.9	96.08	999	-902.92	200	Horz
Vertical 2370 - 2513.5MHz										
2	2480.141	101.51 pk		-35.9	28.9	94.51	999	-904.49	150	Vert

LIMIT 1: CFR 47 PART 15C Bluetooth

LIMIT 2: NONE

LIMIT 3: NONE



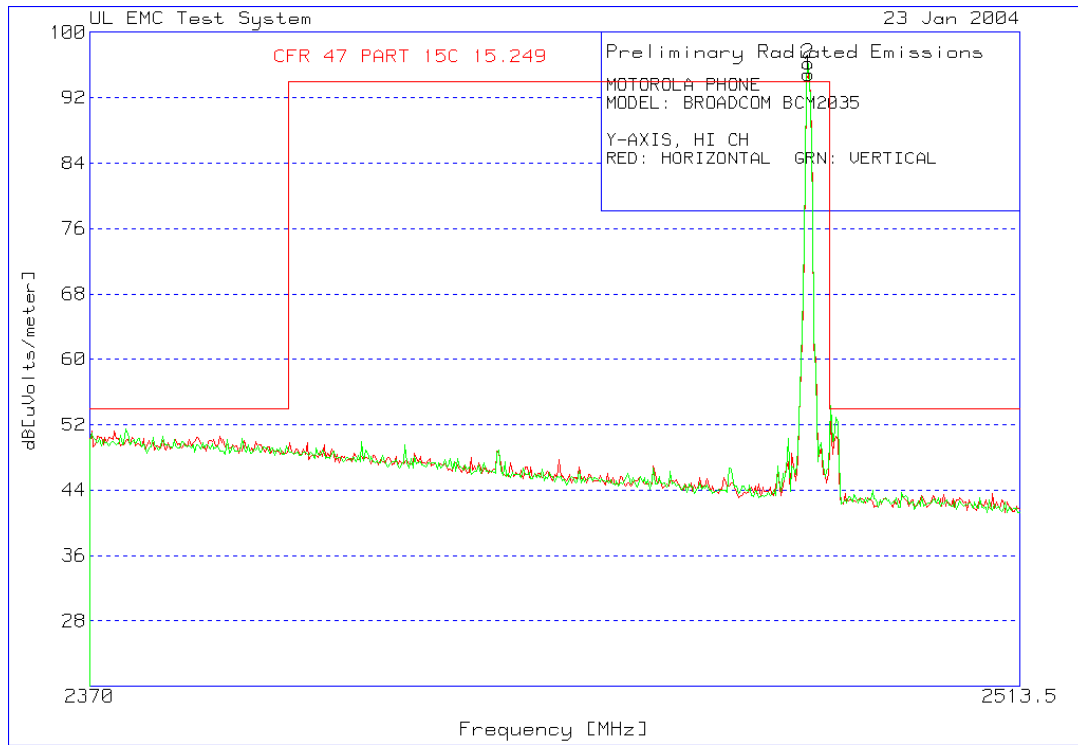
Band Edge Y-Axis Low Channel

MOTOROLA PHONE										
MODEL: BROADCOM BCM2035										
Y-AXIS, LO CH										
RED: HORIZONTAL GRN: VERTICAL										
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2401.921	97.69 pk		-30.4	28.8	96.09	999	-902.91	101	Horz
Vertical 2370 - 2513.5MHz										
2	2402.208	98.45 pk		-30.4	28.8	96.85	999	-902.15	101	Vert
LIMIT 1: CFR 47 PART 15C Bluetooth										
LIMIT 2: NONE										



Band Edge Y-Axis Middle Channel

MOTOROLA PHONE										
MODEL: BROADCOM BCM2035										
Y-AXIS, MID CH										
RED: HORIZONTAL GRN: VERTICAL										
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2441.031	102.66 pk		-33.3	28.8	98.16	999	-900.84	101	Horz
Vertical 2370 - 2513.5MHz										
2	2441.031	103.27 pk		-33.3	28.8	98.77	999	-900.23	101	Vert
LIMIT 1: CFR 47 PART 15C Bluetooth										
LIMIT 2: NONE										



Band Edge Y-Axis High Channel

MOTOROLA PHONE

MODEL: BROADCOM BCM2035

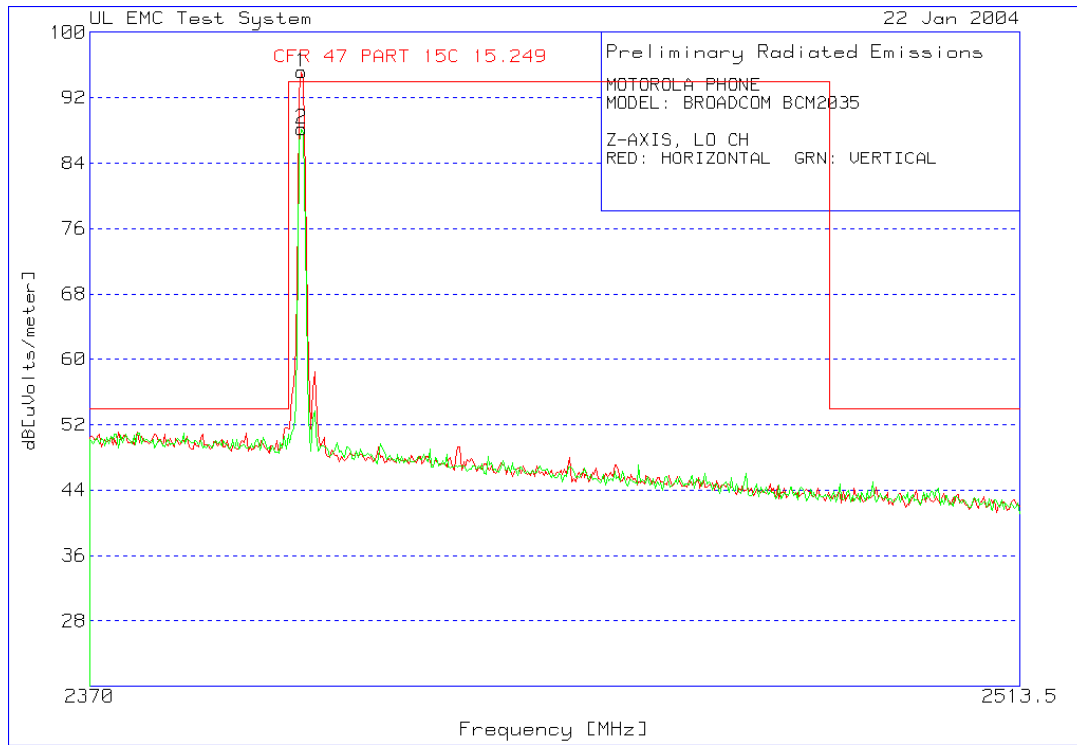
Y-AXIS, HI CH

RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2480.141	101.86 pk		-35.9	28.9	94.86	999	-904.14	101	Horz
Vertical 2370 - 2513.5MHz										
2	2480.141	103.22 pk		-35.9	28.9	96.22	999	-902.78	101	Vert

LIMIT 1: CFR 47 PART 15C Bluetooth

LIMIT 2: NONE



Band Edge Z-Axis Low Channel

MOTOROLA PHONE

MODEL: BROADCOM BCM2035

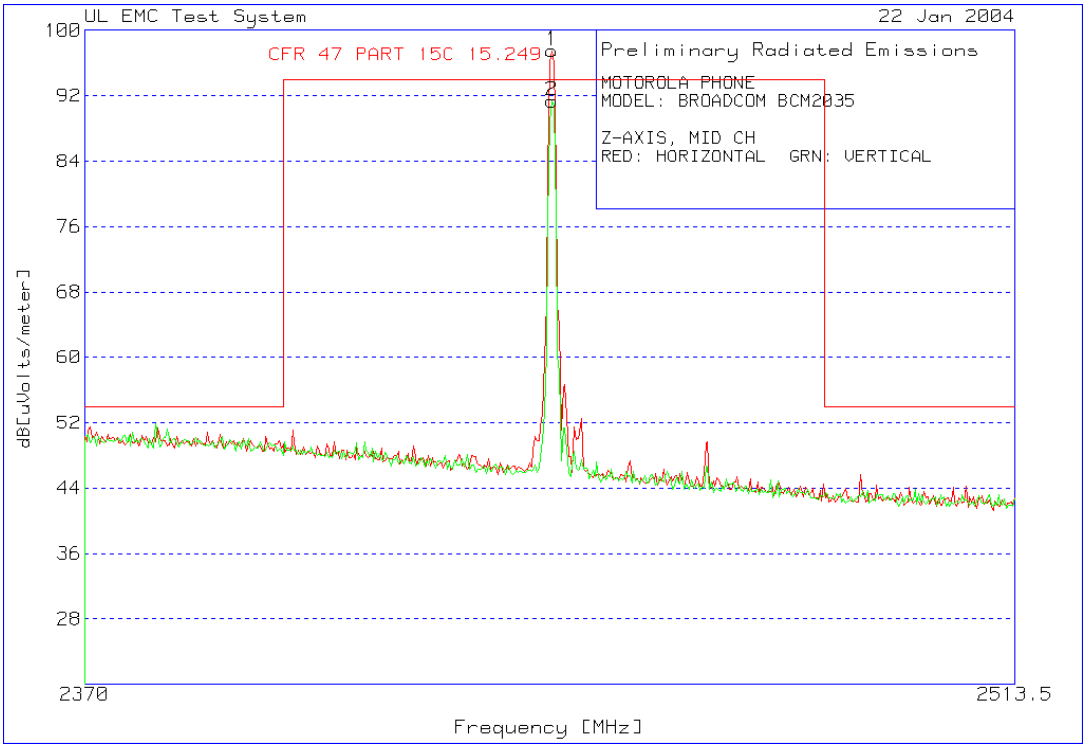
Z-AXIS, LO CH

RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2401.921	96.77	pk	-30.4	28.8	95.17	999	-903.83	101	Horz
Vertical 2370 - 2513.5MHz										
2	2401.921	89.79	pk	-30.4	28.8	88.19	999	-910.81	150	Vert

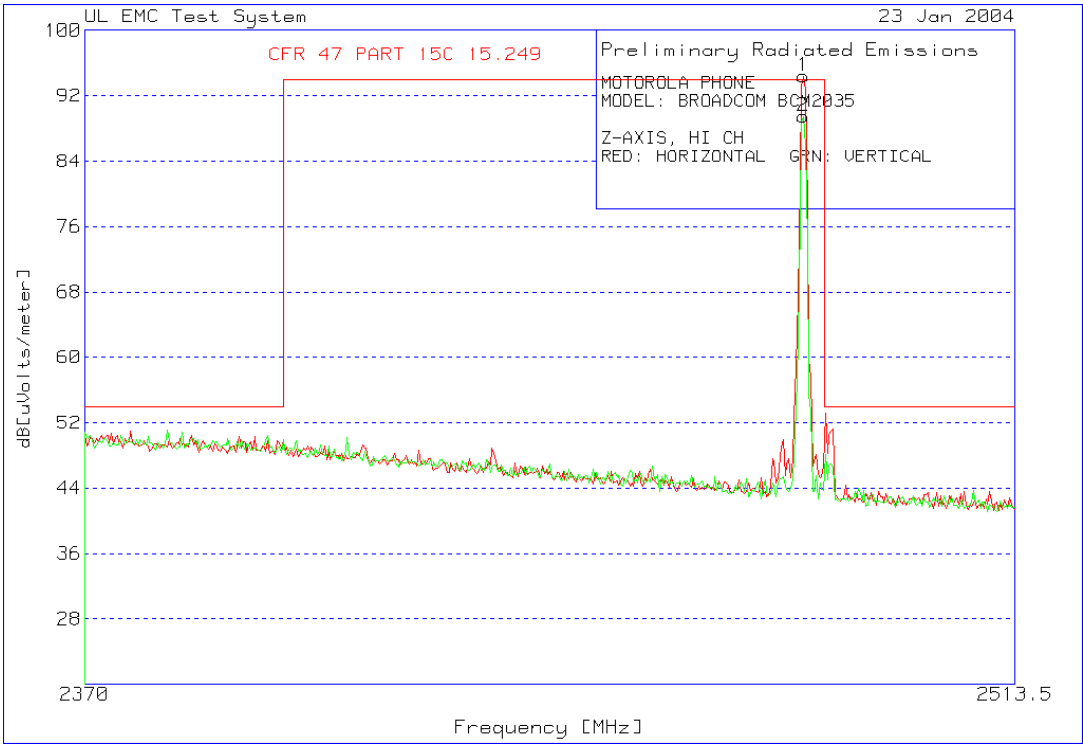
LIMIT 1: CFR 47 PART 15C Bluetooth

LIMIT 2: NONE



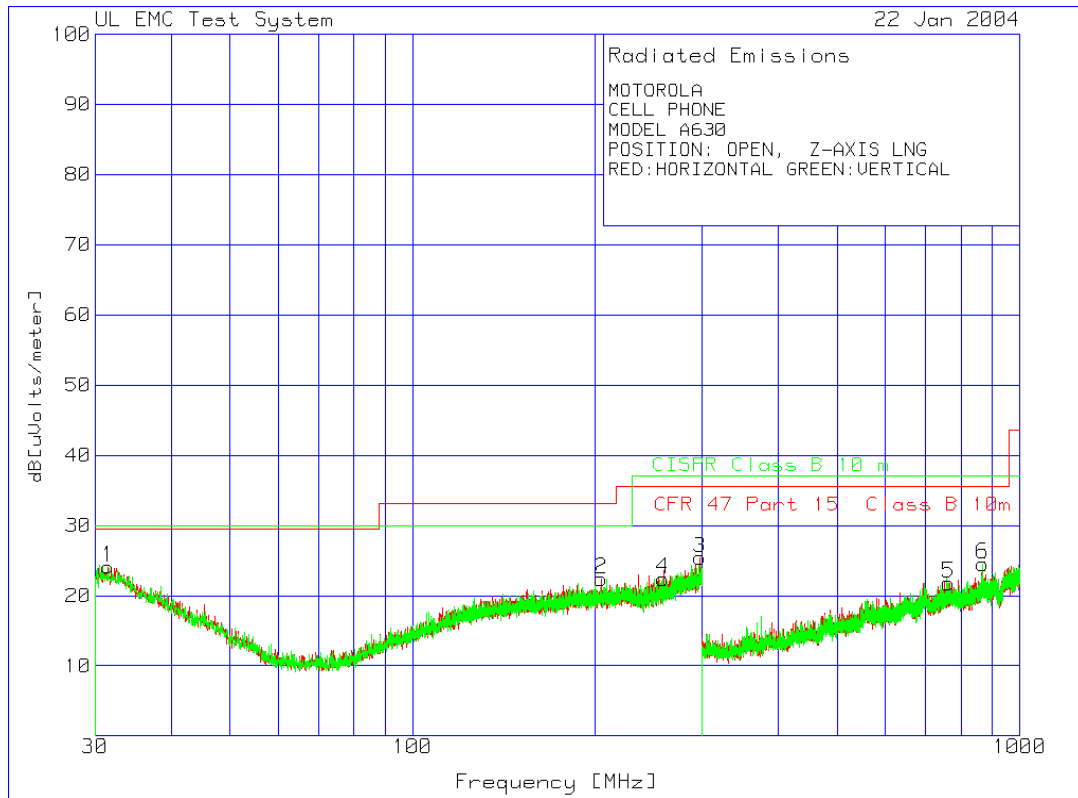
Band Edge Z-Axis Middle Channel

MOTOROLA PHONE									
MODEL: BROADCOM BCM2035									
Z-AXIS, MID CH									
RED: HORIZONTAL GRN: VERTICAL									
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm] Polarity
Horizontal 2370 - 2513.5MHz									
1	2441.031	102.02 pk		-33.3	28.8	97.52	999	-901.48	150 Horz
Vertical 2370 - 2513.5MHz									
2	2441.031	95.88 pk		-33.3	28.8	91.38	999	-907.62	150 Vert
LIMIT 1: CFR 47 PART 15C Bluetooth									
LIMIT 2: NONE									



Band Edge Z-Axis High Channel

MOTOROLA PHONE										
MODEL: BROADCOM BCM2035										
Z-AXIS, HI CH										
RED: HORIZONTAL GRN: VERTICAL										
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
Horizontal 2370 - 2513.5MHz										
1	2480.141	101.39	pk	-35.9	28.9	94.39	999	-904.61	101	Horz
Vertical 2370 - 2513.5MHz										
2	2480.141	96.45	pk	-35.9	28.9	89.45	999	-909.55	150	Vert
LIMIT 1: CFR 47 PART 15C Bluetooth										
LIMIT 2: NONE										



30MHz – 1000MHz Ch 0 Open Z-Axis

**MOTOROLA
CELL PHONE
MODEL A630**

POSITION: OPEN, Z-AXIS LNG

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	31.4839	32 pk	-26.9	19	24.1	29.6	30
	Azimuth:94	Height:200	Horz	Margin [dB]	-5.5	-5.9	
2	204.2208	32.7 pk	-26.3	16	22.4	33.1	30
	Azimuth:38	Height:200	Horz	Margin [dB]	-10.7	-7.6	
3	297.7051	32.6 pk	-25.7	18.5	25.4	35.6	37
	Azimuth:67	Height:200	Horz	Margin [dB]	-10.2	-11.6	

Range: 2 30 - 300MHz

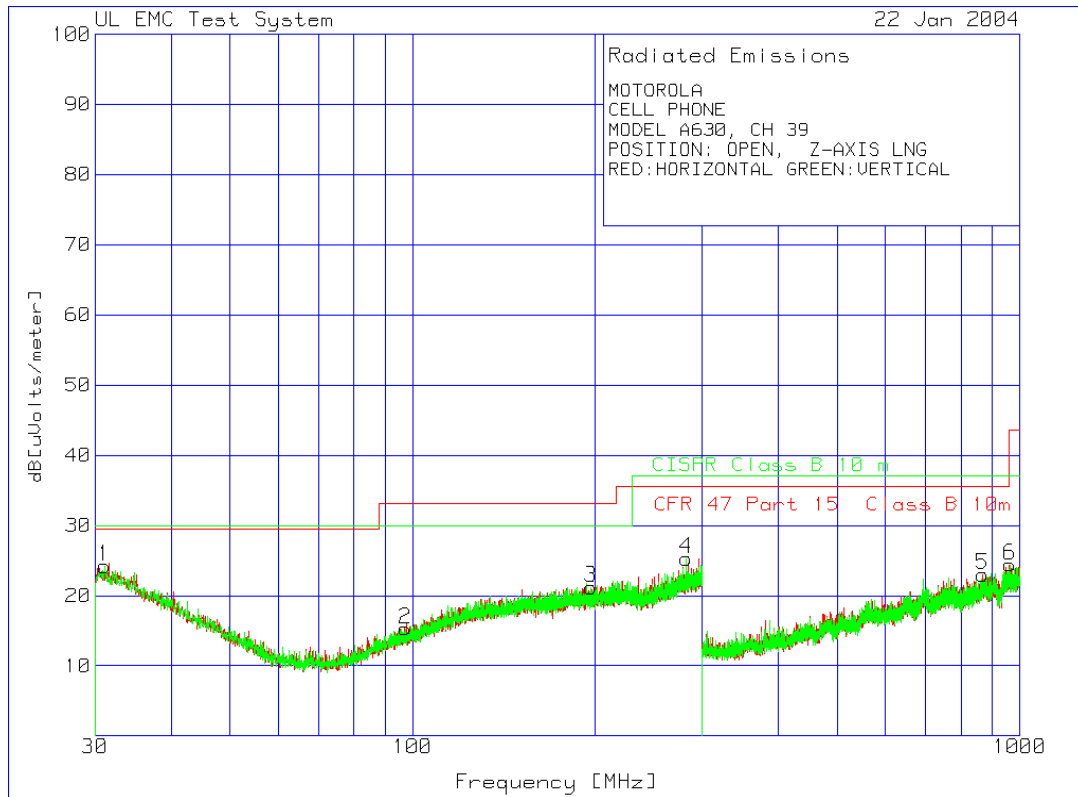
4	258.5847	31.7 pk	-25.8	16.5	22.4	35.6	37
	Azimuth:15	Height:200	Vert	Margin [dB]	-13.2	-14.6	

Range: 4 300 - 1000MHz

5	762.8782	31.1 pk	-31.3	22	21.8	35.6	37
	Azimuth:251	Height:200	Vert	Margin [dB]	-13.8	-15.2	
6	869.1986	32.4 pk	-31.8	23.9	24.5	35.6	37
	Azimuth:180	Height:200	Vert	Margin [dB]	-11.1	-12.5	

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: CISPR Class B 10 m



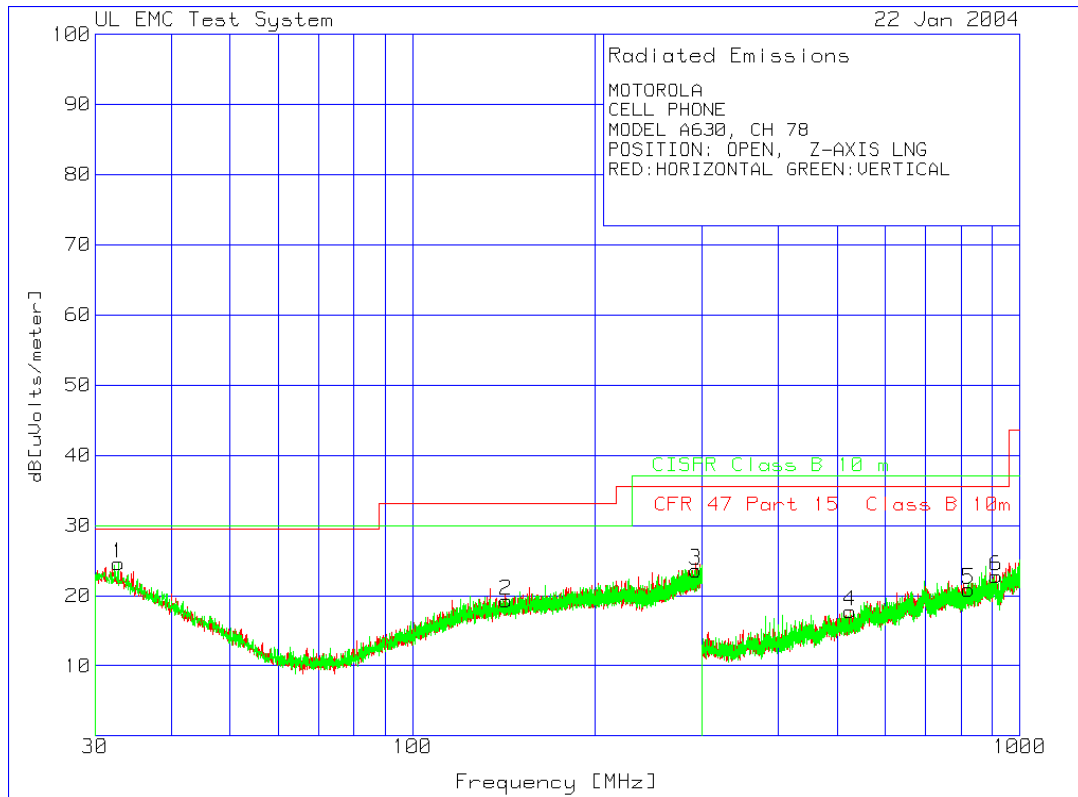
30MHz – 1000MHz Ch 39 Open Z-Axis

MOTOROLA
CELL PHONE
MODEL A630, CH 39
POSITION: OPEN, Z-AXIS LNG
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: 2 30 - 300MHz							
1	31.0792	32 pk	-26.9	19.1	24.2	29.6	30
	Azimuth:136	Height:100	Vert	Margin [dB]	-5.4 -5.8		
2	97.1792	31.7 pk	-26.6	10.2	15.3	33.1	30
	Azimuth:136	Height:100	Vert	Margin [dB]	-17.8 -14.7		
3	196.7339	31.7 pk	-26.4	15.9	21.2	33.1	30
	Azimuth:81	Height:100	Vert	Margin [dB]	-11.9 -8.8		
4	282.1244	33.3 pk	-25.7	17.7	25.3	35.6	37
	Azimuth:244	Height:100	Vert	Margin [dB]	-10.3 -11.7		
Range: 3 300 - 1000MHz							
5	869.8981	31 pk	-31.9	23.9	23	35.6	37
	Azimuth:12	Height:100	Horz	Margin [dB]	-12.6 -14		
Range: 4 300 - 1000MHz							
6	962.4038	31.7 pk	-31.6	24.3	24.4	43.5	37
	Azimuth:309	Height:100	Vert	Margin [dB]	-19.1 -12.6		

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: CISPR Class B 10 m

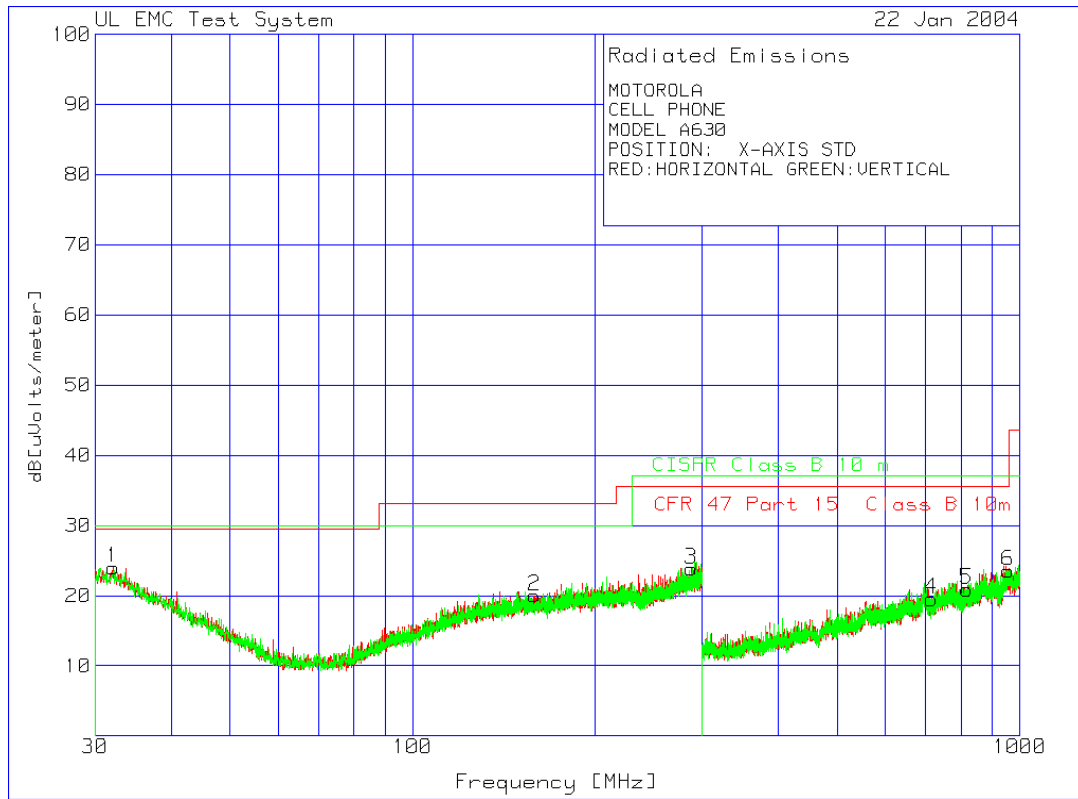


MOTOROLA
CELL PHONE
MODEL A630, CH 78
POSITION: OPEN, Z-AXIS LNG
RED:HORIZONTAL GREEN:VERTICAL

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 2 30 - 300MHz							
1	32.7654	32.8 pk	-26.9	18.7	24.6	29.6	30
	Azimuth:257	Height:100	Vert	Margin [dB]	-5	-5.4	
2	142.37	31.4 pk	-26.6	14.5	19.3	33.1	30
	Azimuth:249	Height:100	Vert	Margin [dB]	-13.8	-10.7	
3	292.7139	31.1 pk	-25.6	18.1	23.6	35.6	37
	Azimuth:29	Height:100	Vert	Margin [dB]	-12	-13.4	
Range: 3 300 - 1000MHz							
4	525.4061	31.8 pk	-31.8	17.8	17.8	35.6	37
	Azimuth:77	Height:100	Horz	Margin [dB]	-17.8	-19.2	
5	822.8583	30.9 pk	-31.9	21.9	20.9	35.6	37
	Azimuth:66	Height:100	Horz	Margin [dB]	-14.7	-16.1	
6	913.9651	31.2 pk	-32	23.6	22.8	35.6	37
	Azimuth:271	Height:100	Horz	Margin [dB]	-12.8	-14.2	

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: CISPR Class B 10 m



30MHz - 1000MHz Ch 0 X-Axis

**MOTOROLA
CELL PHONE
MODEL A630**

POSITION: X-AXIS STD

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
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Range: 1 30 - 300MHz

1	32.0909	32.1 pk	-26.9	18.8	24	29.6 30
	Azimuth:243	Height:100	Horz	Margin [dB]	-5.6	-6
2	158.6927	31.6 pk	-26.6	15	20	33.1 30
	Azimuth:84	Height:100	Horz	Margin [dB]	-13.1	-10
3	287.5877	31.5 pk	-25.7	18	23.8	35.6 37
	Azimuth:350	Height:100	Horz	Margin [dB]	-11.8	-13.2

Range: 3 300 - 1000MHz

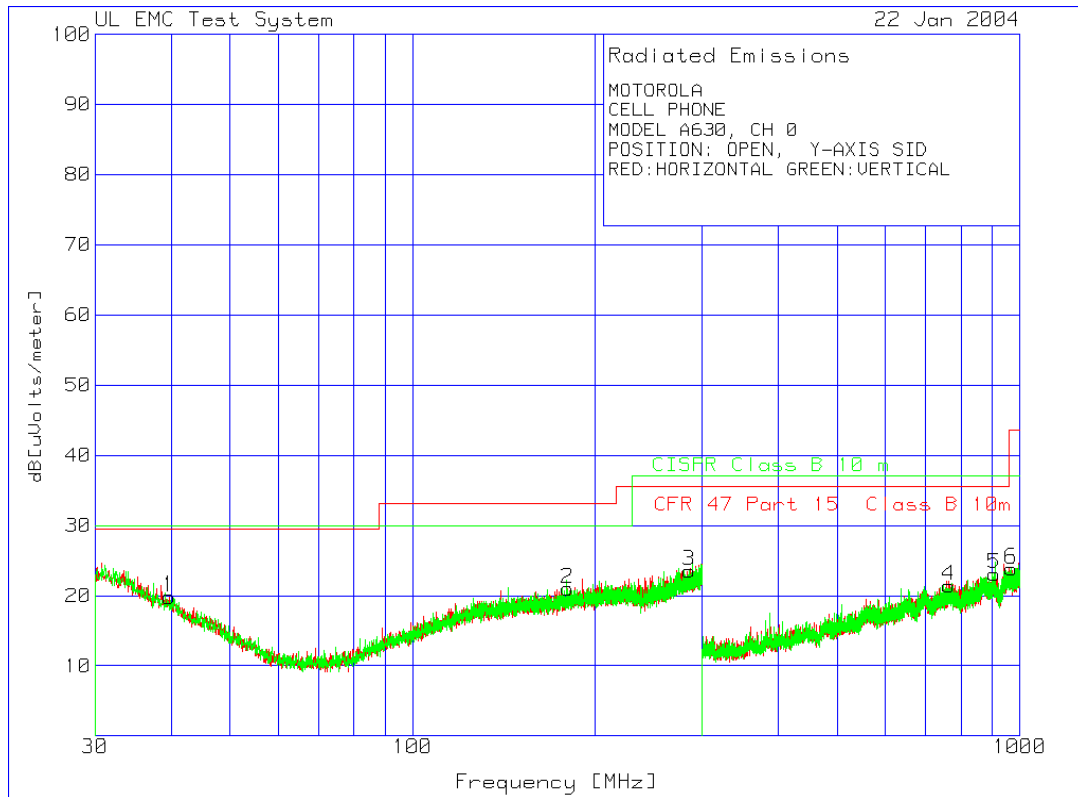
6	957.6823	30.5 pk	-31.4	24.4	23.5	35.6 37
	Azimuth:297	Height:100	Horz	Margin [dB]	-12.1	-13.5

Range: 4 300 - 1000MHz

4	715.8385	30.2 pk	-31	20.3	19.5	35.6 37
	Azimuth:211	Height:100	Vert	Margin [dB]	-16.1	-17.5
5	817.962	30.5 pk	-31.5	21.9	20.9	35.6 37
	Azimuth:65	Height:100	Vert	Margin [dB]	-14.7	-16.1

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: CISPR Class B 10 m



30MHz – 1000MHz Ch 0 Y-Axis

MOTOROLA
CELL PHONE
MODEL A630, CH 0
POSITION: OPEN, Y-AXIS SID
RED:HORIZONTAL GREEN:VERTICAL

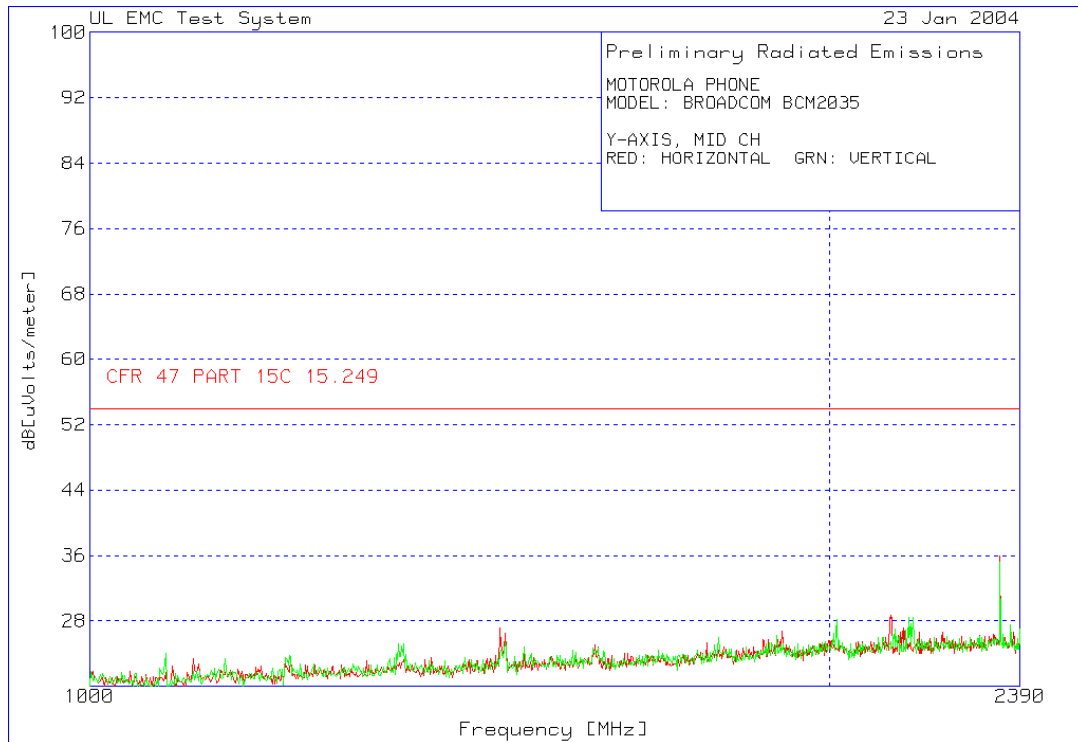
Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit:1	2
Range: 1 30 - 300MHz							
1	39.7127	31.6 pk	-26.9	15.1	19.8	29.6	30
	Azimuth:150	Height:100	Horz	Margin [dB]	-9.8	-10.2	
2	180.074	31.7 pk	-26.4	15.7	21	33.1	30
	Azimuth:343	Height:100	Horz	Margin [dB]	-12.1	-9	
Range: 2 30 - 300MHz							
3	285.227	31.3 pk	-25.7	17.9	23.5	35.6	37
	Azimuth:284	Height:100	Vert	Margin [dB]	-12.1	-13.5	
Range: 3 300 - 1000MHz							
4	764.1023	30.7 pk	-31.3	22	21.4	35.6	37
	Azimuth:78	Height:100	Horz	Margin [dB]	-14.2	-15.6	
Range: 4 300 - 1000MHz							
5	909.0687	31.1 pk	-31.8	23.8	23.1	35.6	37
	Azimuth:322	Height:100	Vert	Margin [dB]	-12.5	-13.9	
6	968.3493	31.3 pk	-31.4	23.9	23.8	43.5	37
	Azimuth:77	Height:100	Vert	Margin [dB]	-19.7	-13.2	

LIMIT 1: CFR 47 Part 15 Class B 10m

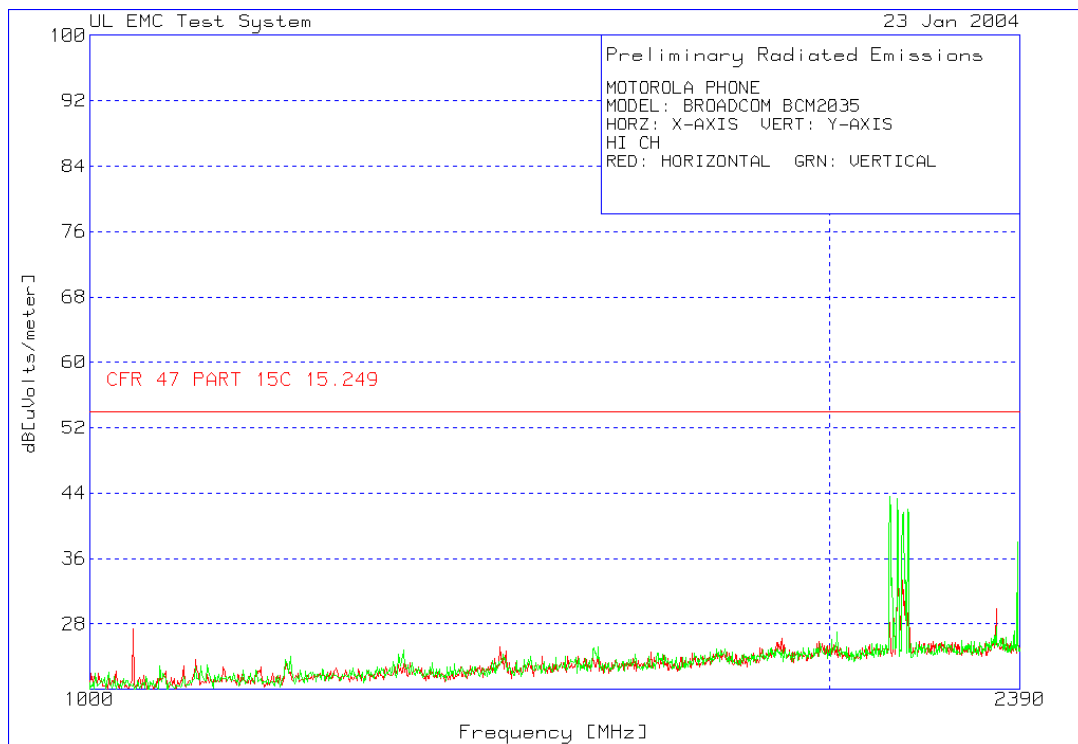
LIMIT 2: CISPR Class B 10 m



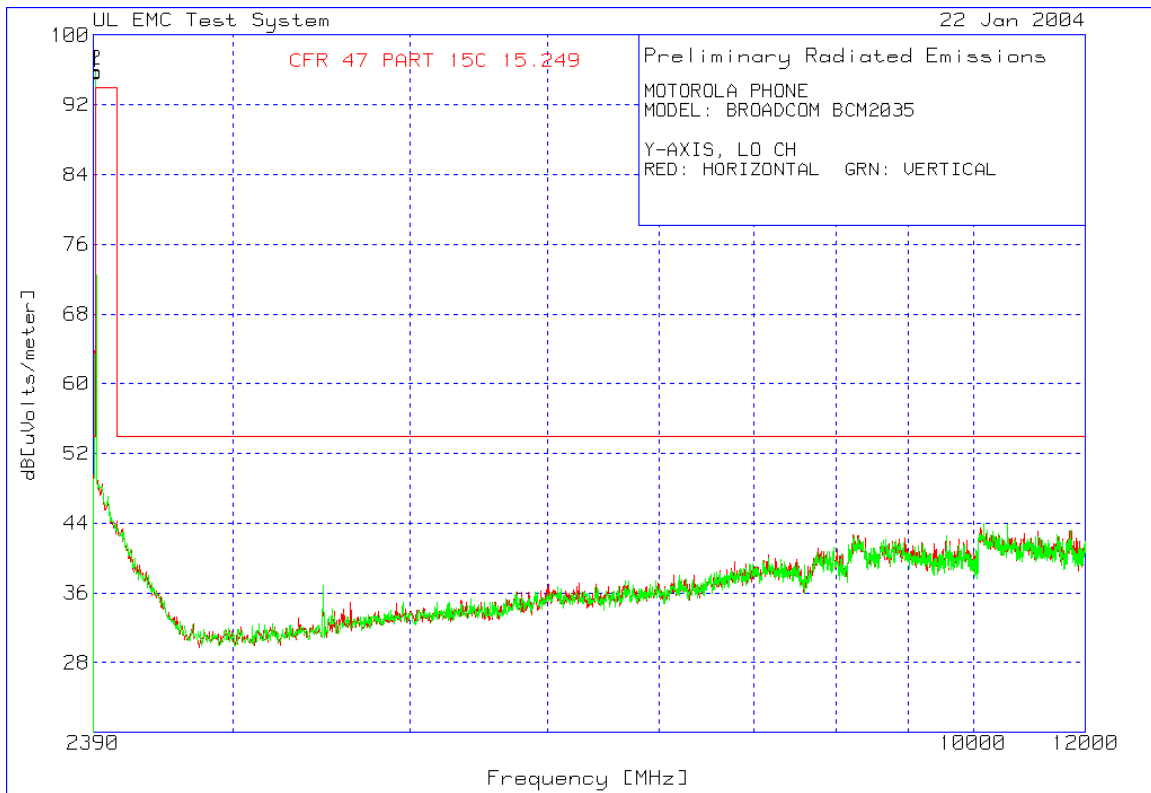
1-2.39GHz Y-Axis Low Channel



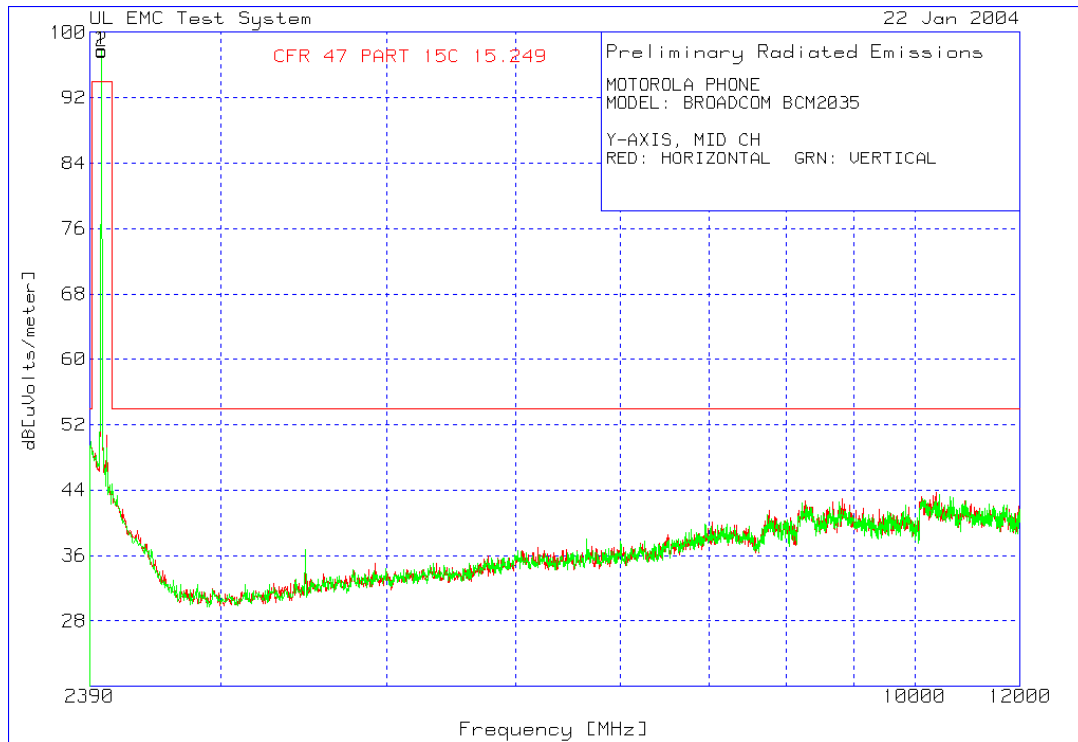
1-2.39GHz Y-Axis Middle Channel



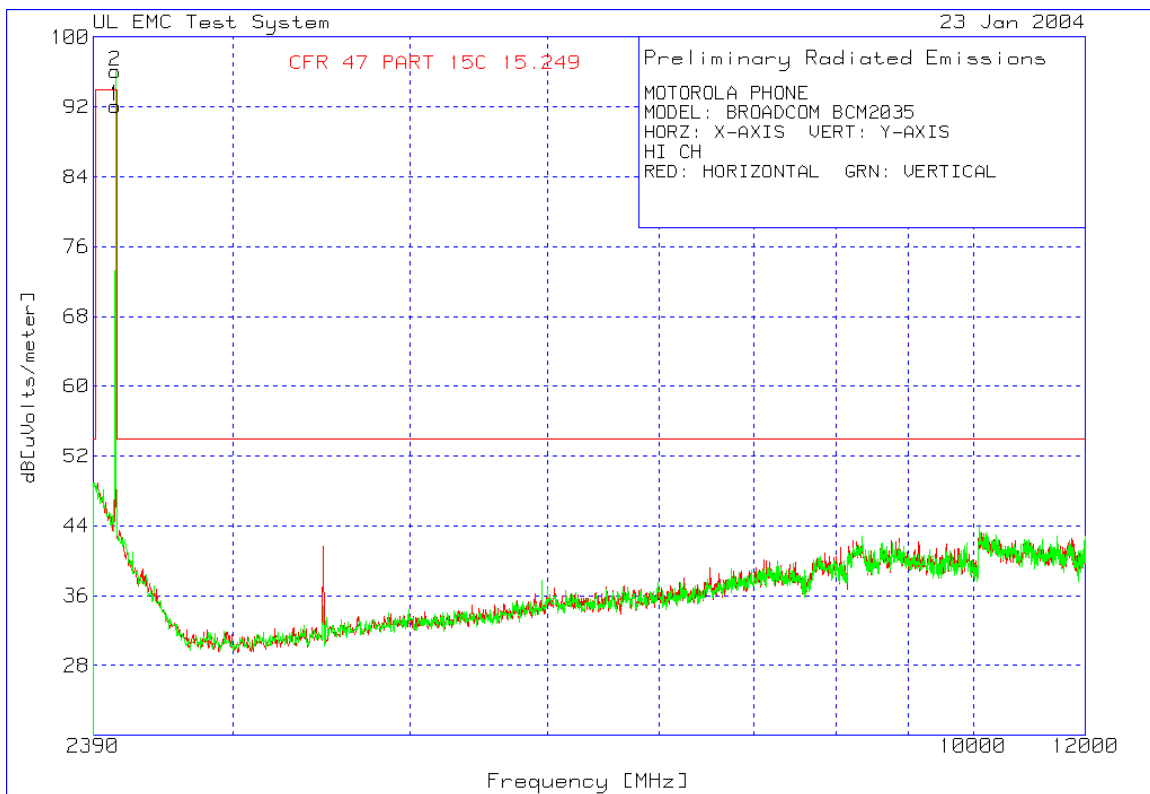
1-2.39GHz X-Axis Y-Axis High Channel



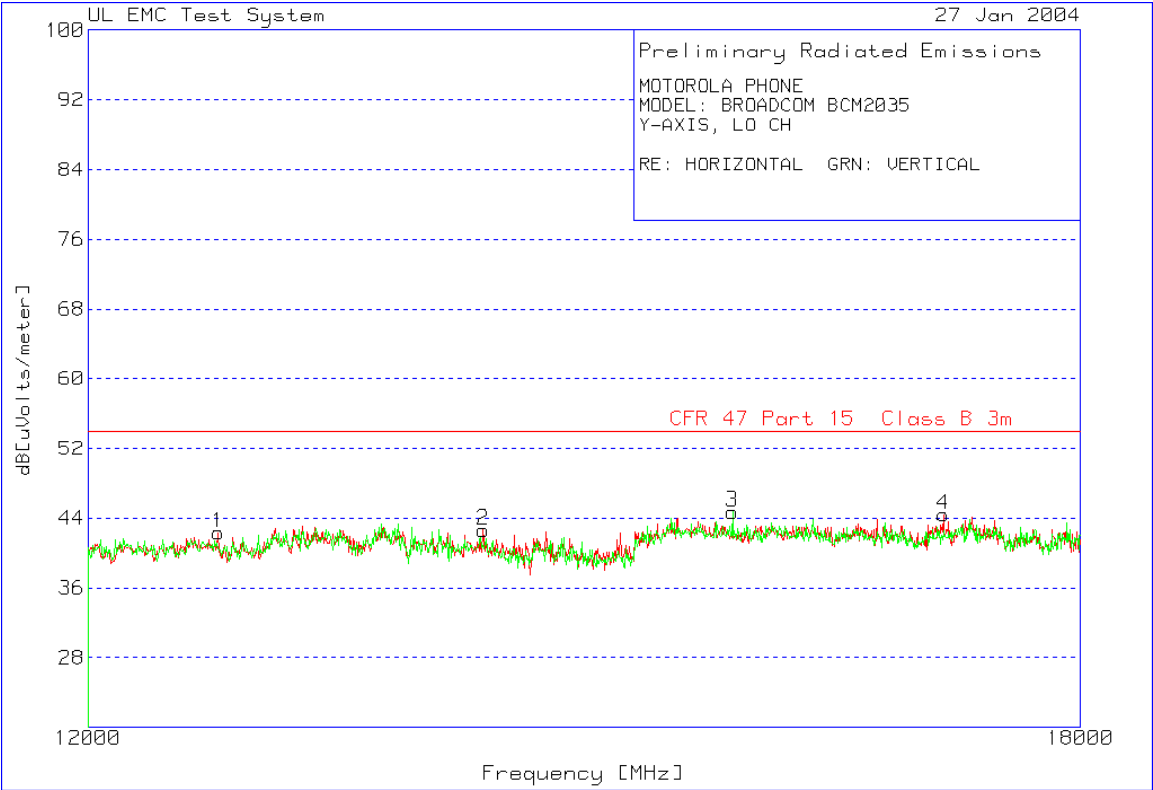
2.39GHz – 12GHz Y-Axis Low Channel



2.39GHz – 12GHz Y-Axis Middle Channel



2.39GHz-12GHz Y-Axis High Channel

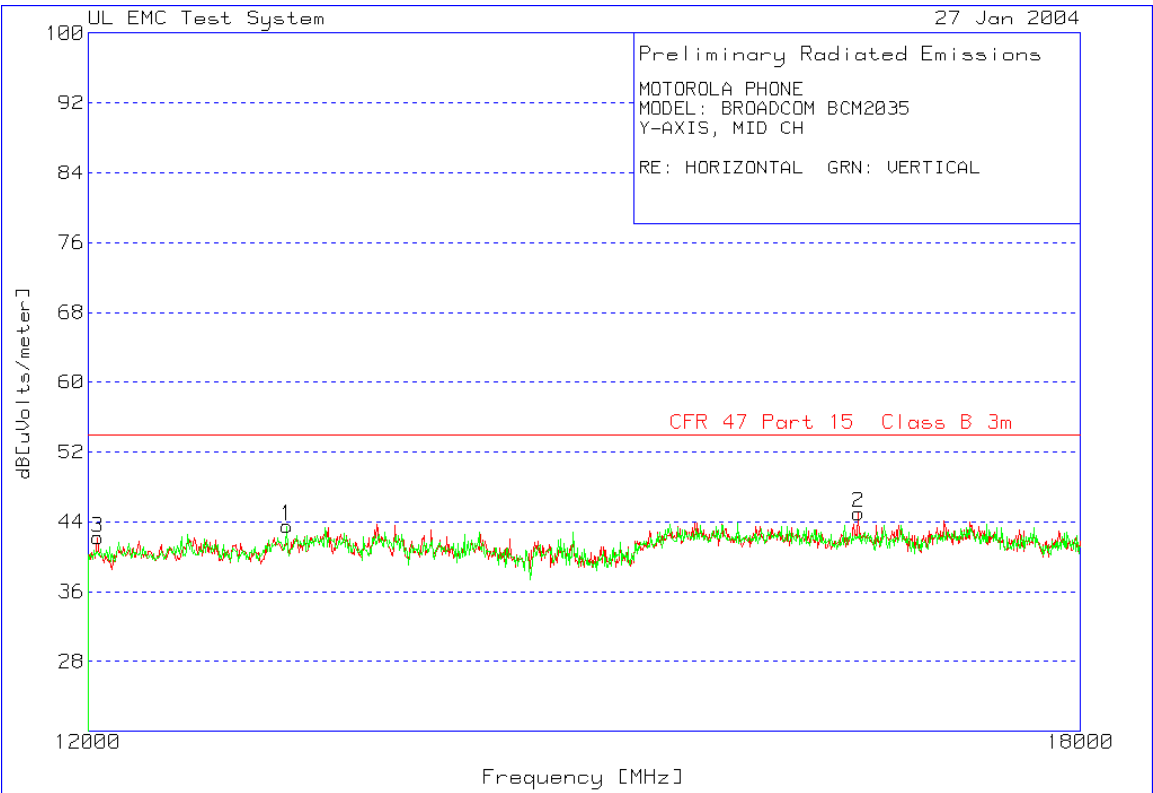


12-18GHz Y-Axis Low Channel

MOTOROLA PHONE
 MODEL: BROADCOM BCM2035
 Y-AXIS, LO CH
 RE: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Horizontal 12000 - 18000MHz								
1	12654.66	50.74	pk	-47.9	39.5	42.34	54	-11.66
2	14102.1	47.53	pk	-44.8	39.9	42.63	54	-11.37
4	17021.02	46.61	pk	-42.6	40.4	44.41	54	-9.59
Vertical 12000 - 18000MHz								
3	15615.62	47.34	pk	-42.7	40.1	44.74	54	-9.26

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

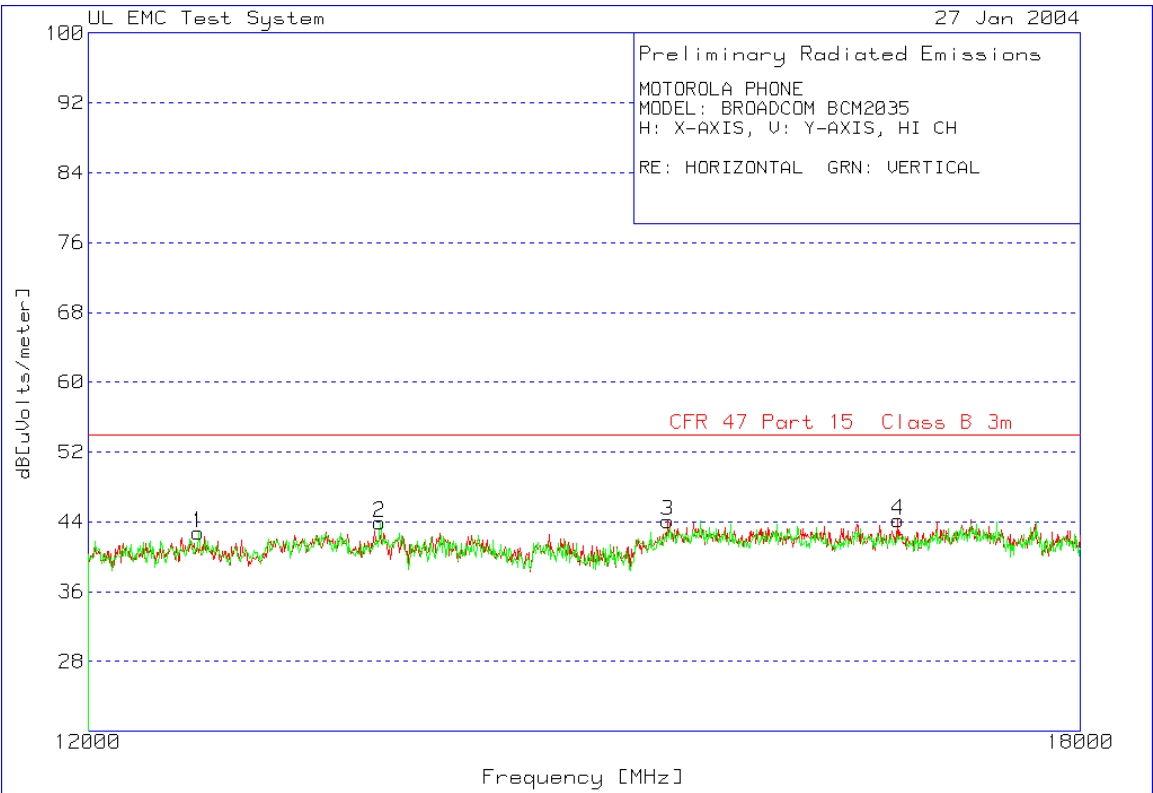


12-18GHz Y-Axis Middle Channel

MOTOROLA PHONE
 MODEL: BROADCOM BCM2035
 Y-AXIS, MID CH
 RE: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Horizontal 12000 - 18000MHz								
2	16438.44	47.71 pk		-42.4	39.7	45.01	54	-8.99
3	12048.05	51.68 pk		-48.9	39.4	42.18	54	-11.82
Vertical 12000 - 18000MHz								
1	13015.02	50.61 pk		-46.9	39.8	43.51	54	-10.49

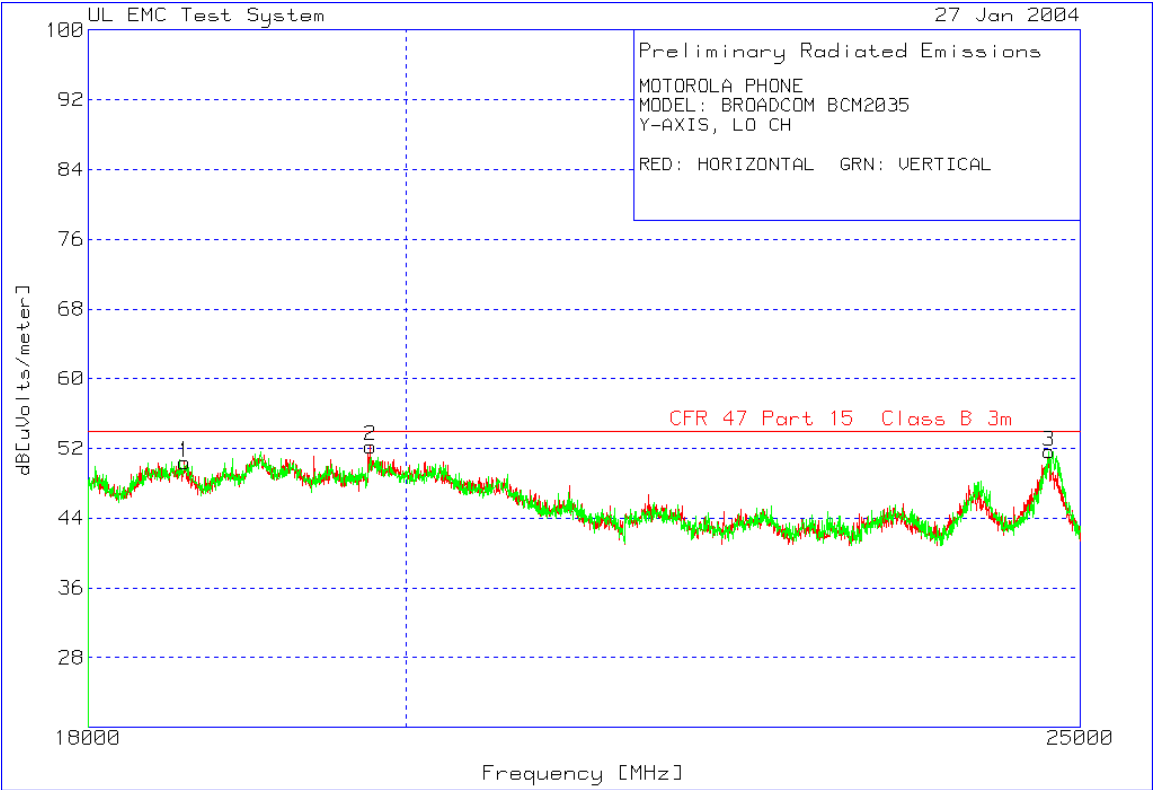
LIMIT 1: CFR 47 Part 15 Class B 3m



12-18GHz X, Y-Axis High Channel

MOTOROLA PHONE								
MODEL: BROADCOM BCM2035								
h: X-AXIS, V: Y-AXIS, HI CH								
RED: HORIZONTAL GRN: VERTICAL								
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Vertical 18000 - 25000MHz								
1	19019.01	72.35	pk	-60.7	40.2	51.85	54	-2.15
2	19761.38	72.12	pk	-60.9	40.3	51.52	54	-2.48
3	24807.4	70.8	pk	-59	40.3	52.1	54	-1.9

LIMIT 1: CFR 47 Part 15 Class B 3m



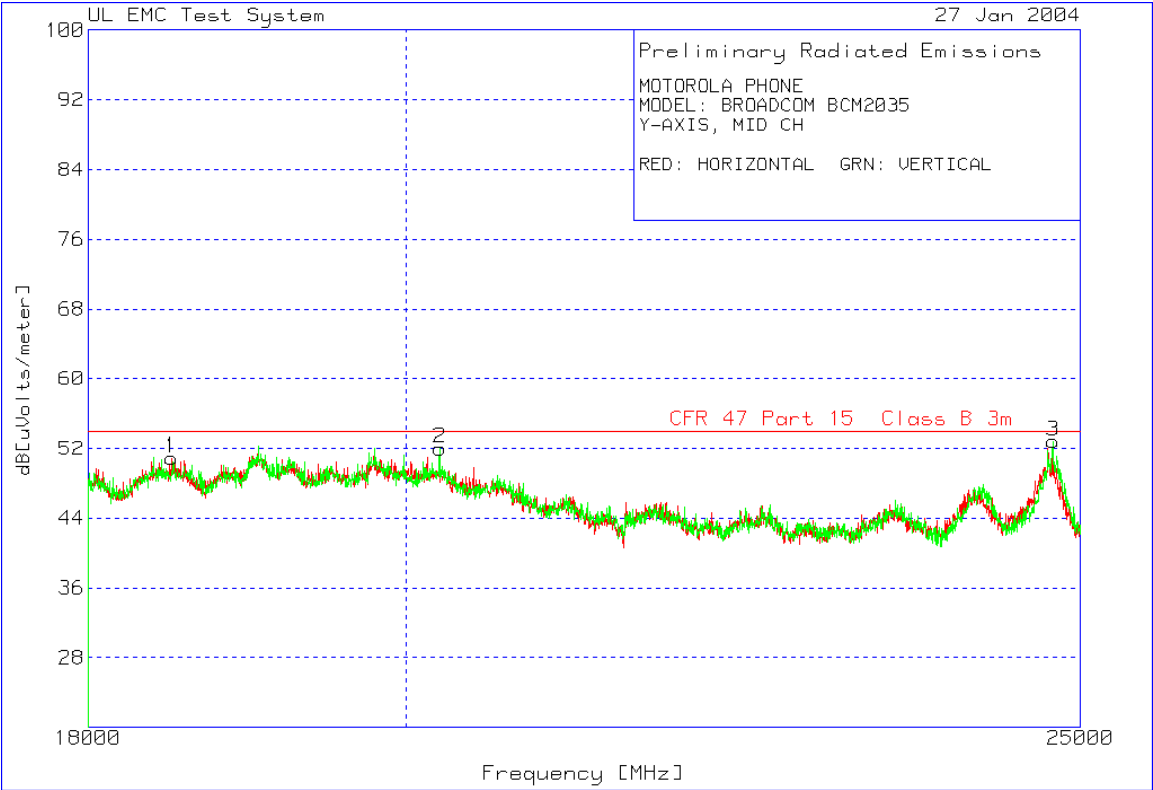
18-25GHz Y-Axis Low Channel

MOTOROLA PHONE
 MODEL: BROADCOM BCM2035
 Y-AXIS, LO CH

RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transduce Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Horizontal 18000 - 25000MHz								
1	18584.79	70.9	pk	-60.6	40.1	50.4	54	-3.6
2	19764.88	72.87	pk	-60.9	40.3	52.27	54	-1.73
Vertical 18000 - 25000MHz								
3	24740.87	69.94	pk	-58.6	40.3	51.64	54	-2.36

LIMIT 1: CFR 47 Part 15 Class B 3m

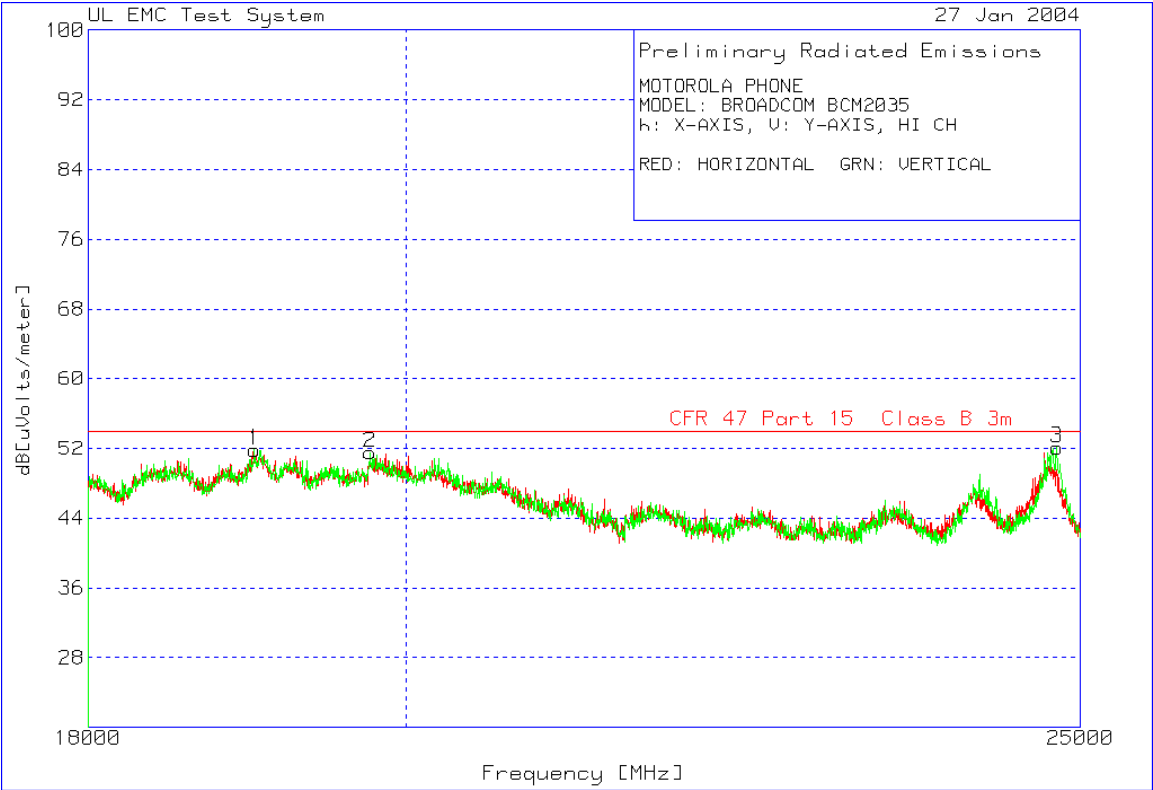


18-25GHz Y-Axis Middle Channel

MOTOROLA PHONE
 MODEL: BROADCOM BCM2035
 Y-AXIS, MID CH
 RED: HORIZONTAL GRN: VERTICAL

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Horizontal 18000 - 25000MHz								
1	18504.25	71.4	pk	-60.6	40.1	50.9	54	-3.1
Vertical 18000 - 25000MHz								
2	20223.61	73	pk	-61.2	40.2	52	54	-2
3	24775.89	71.33	pk	-58.8	40.3	52.83	54	-1.17

LIMIT 1: CFR 47 Part 15 Class B 3m



18-25 GHz Y-Axis High Channel

MOTOROLA PHONE								
MODEL: BROADCOM BCM2035								
h: X-AXIS, V: Y-AXIS, HI CH								
RED: HORIZONTAL GRN: VERTICAL								
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]
Vertical 18000 - 25000MHz								
1	19019.01	72.35 pk		-60.7	40.2	51.85	54	-2.15
2	19761.38	72.12 pk		-60.9	40.3	51.52	54	-2.48
3	24807.4	70.8 pk		-59	40.3	52.1	54	-1.9

LIMIT 1: CFR 47 Part 15 Class B 3m

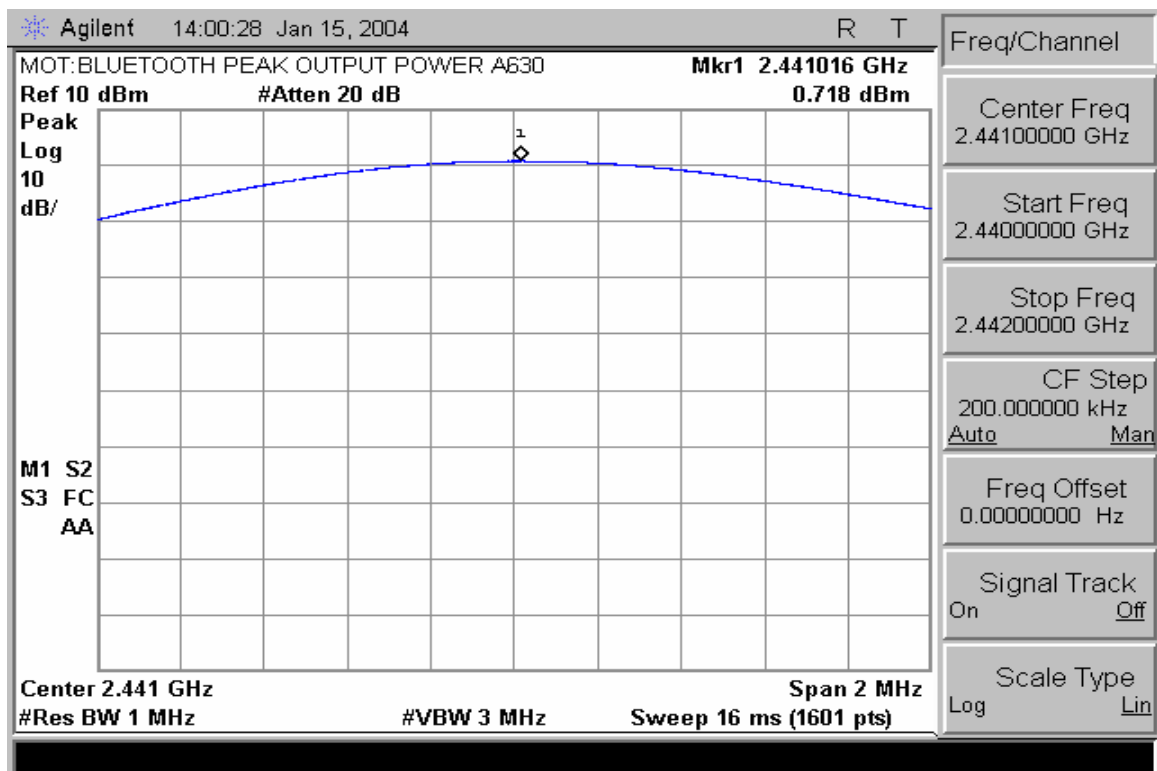
PEAK OUTPUT POWER

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

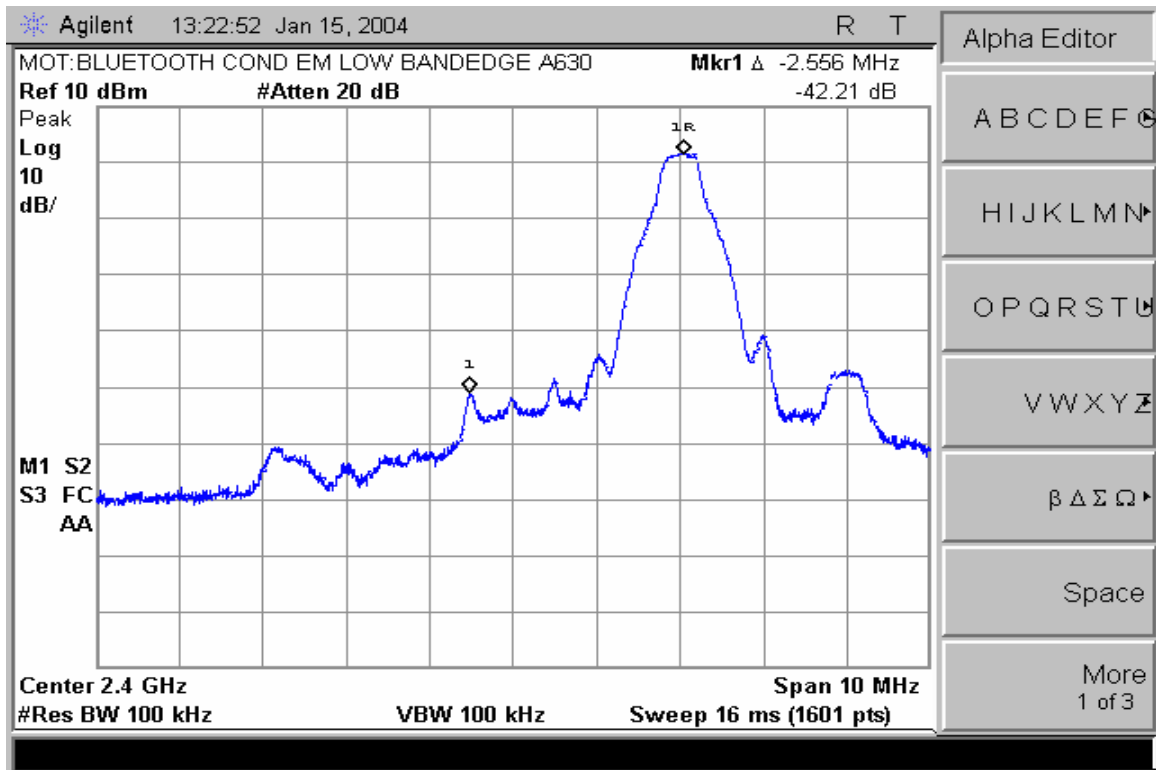
CFR 47 Part 15.247

Measurement Procedure

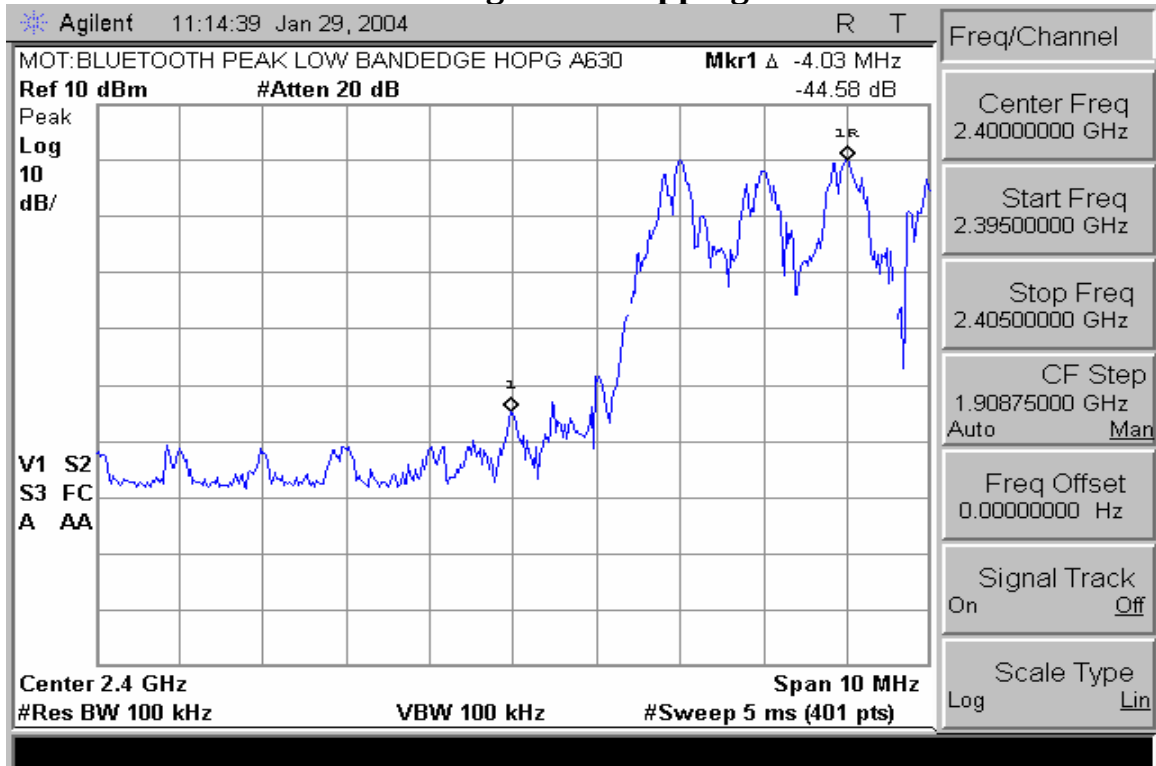
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

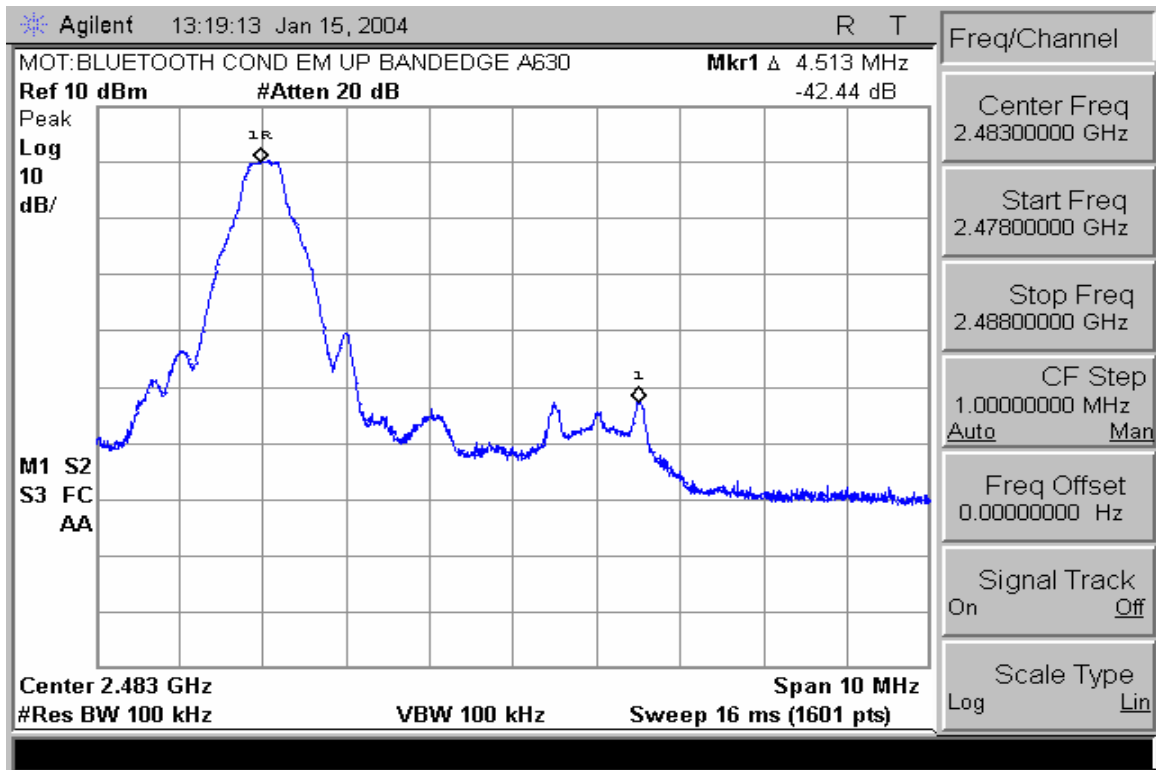
See Attached:



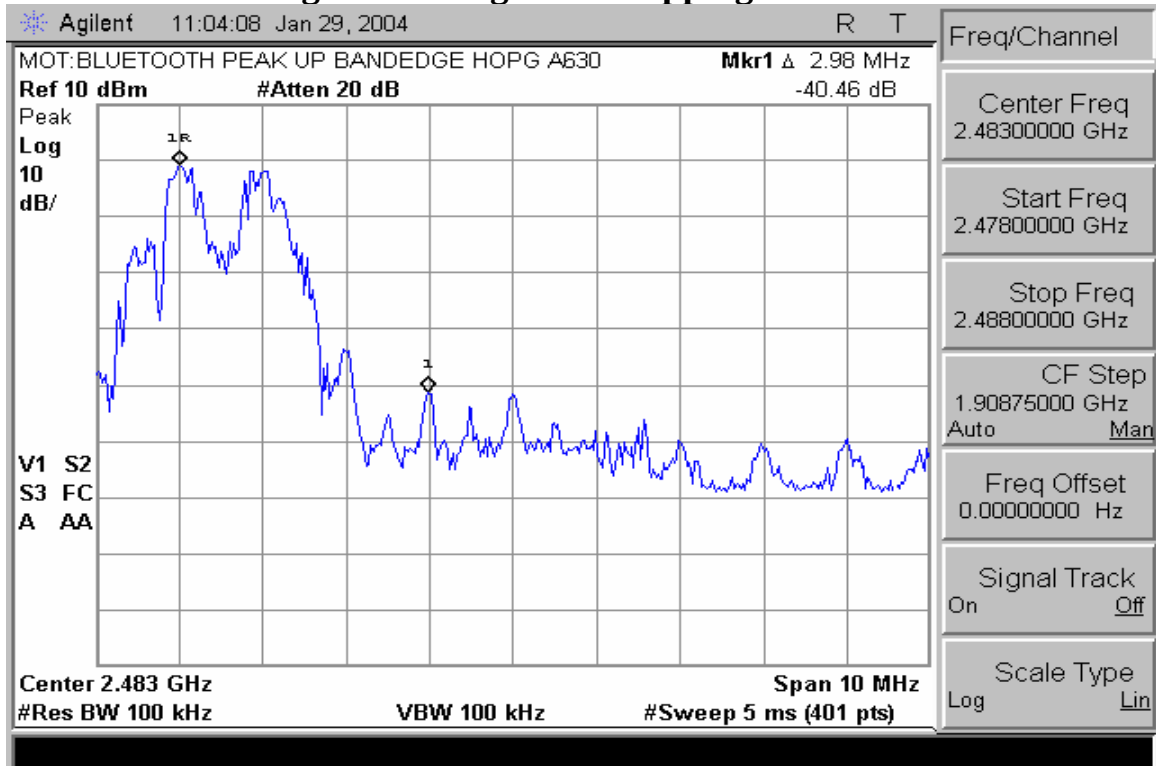
Low Band Edge with Hopping Disabled



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

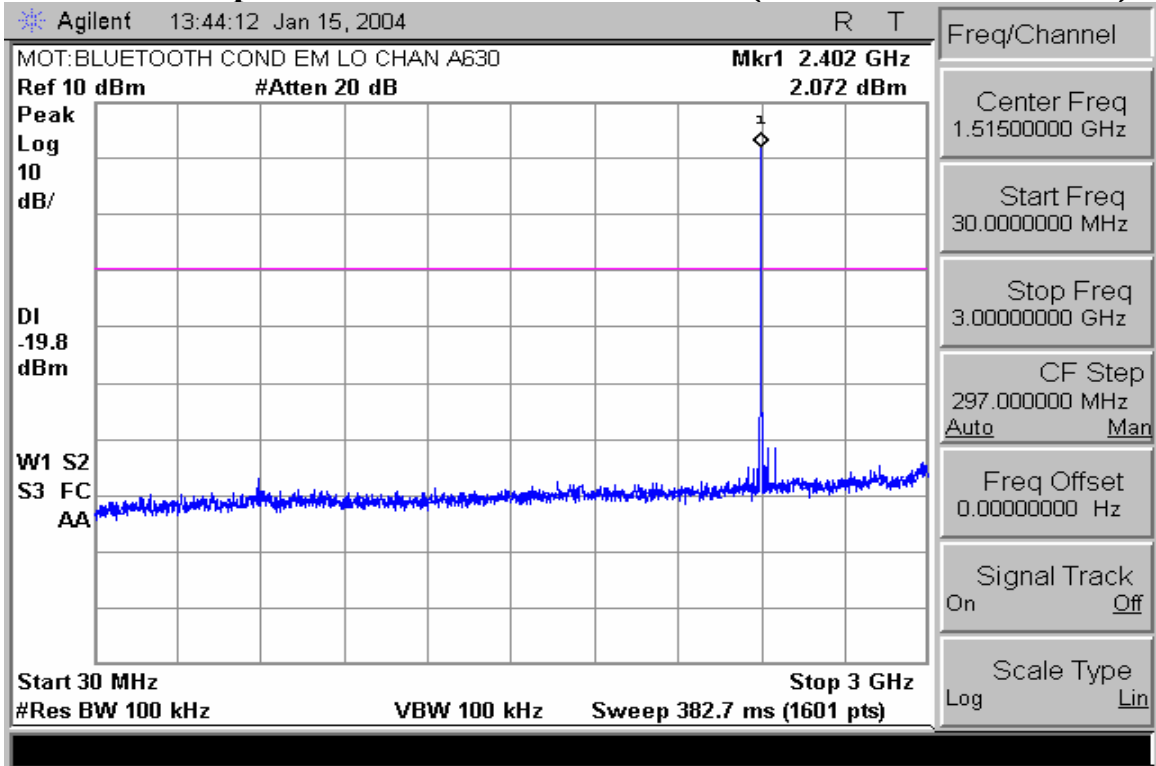
Measurement Procedure

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.

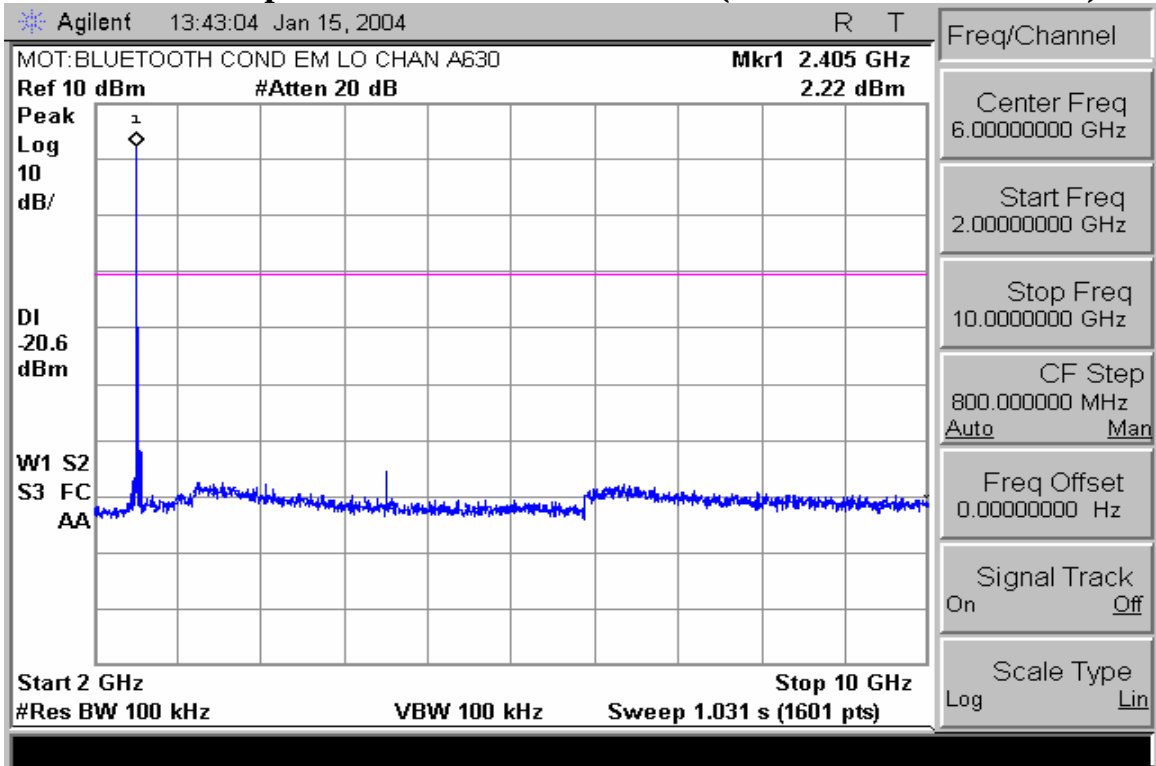
Measurement Results

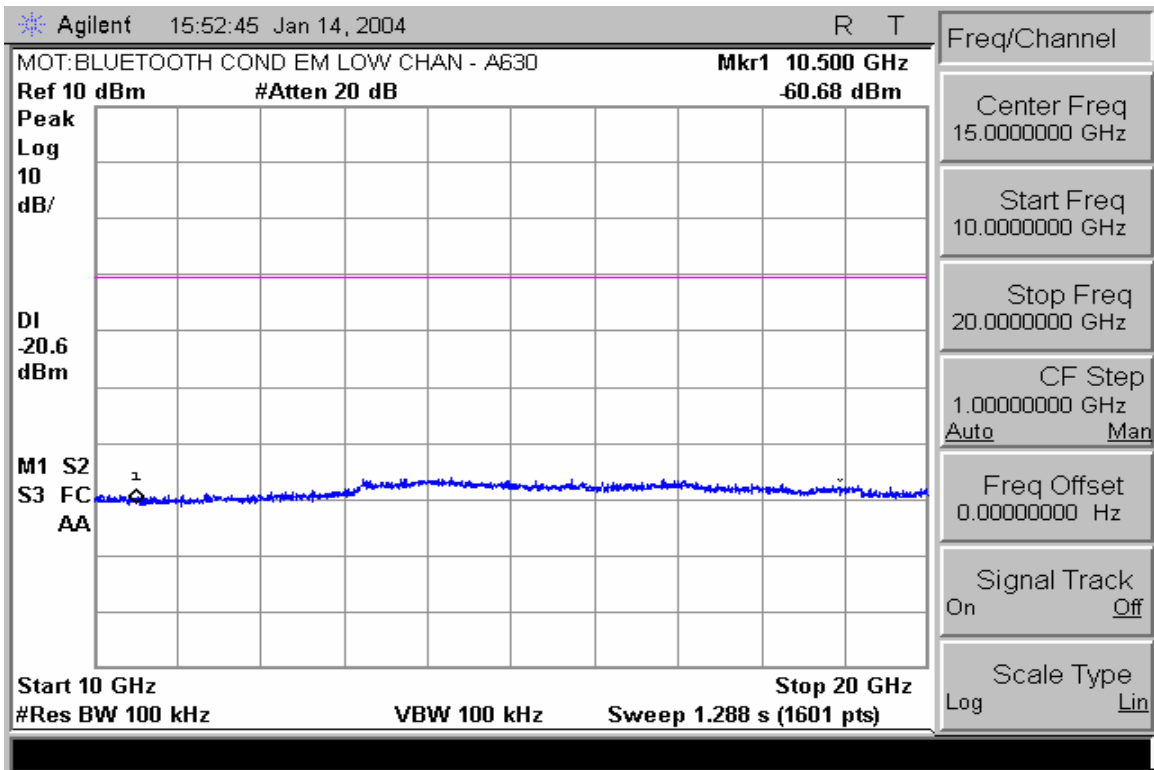
See attached:

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

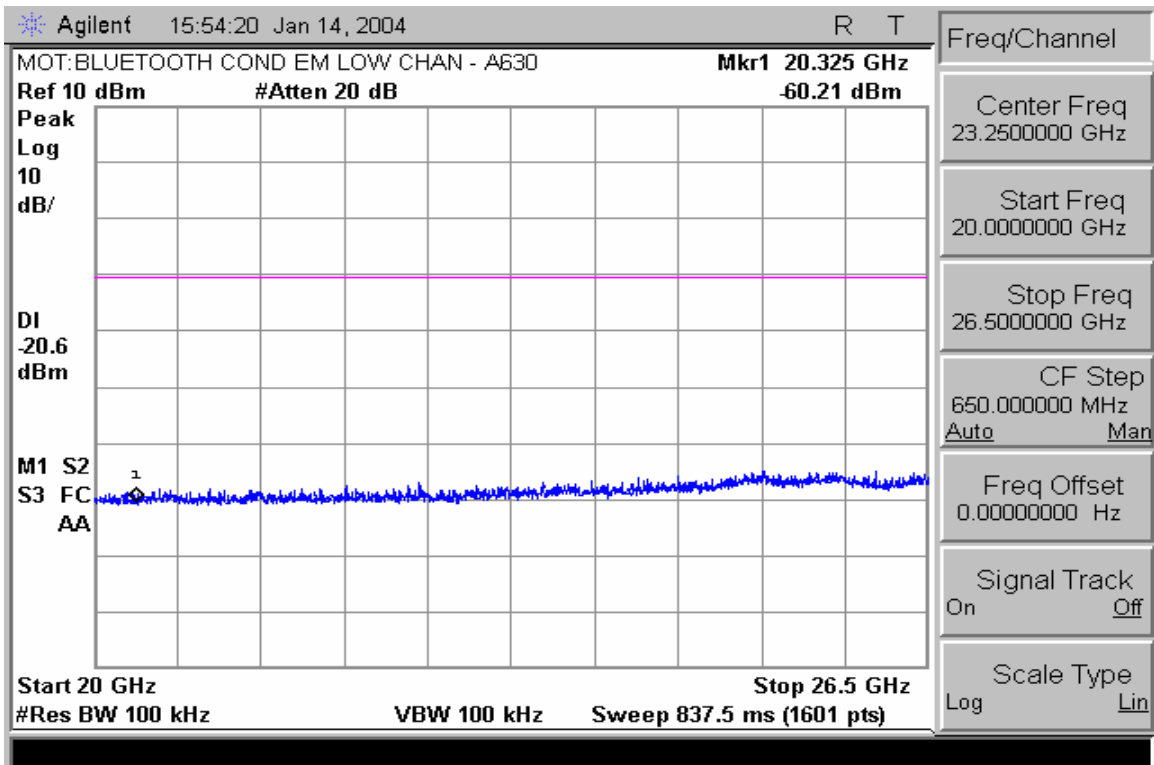


Conducted Spurious Emissions 2-10GHz (Low Channel Enabled)

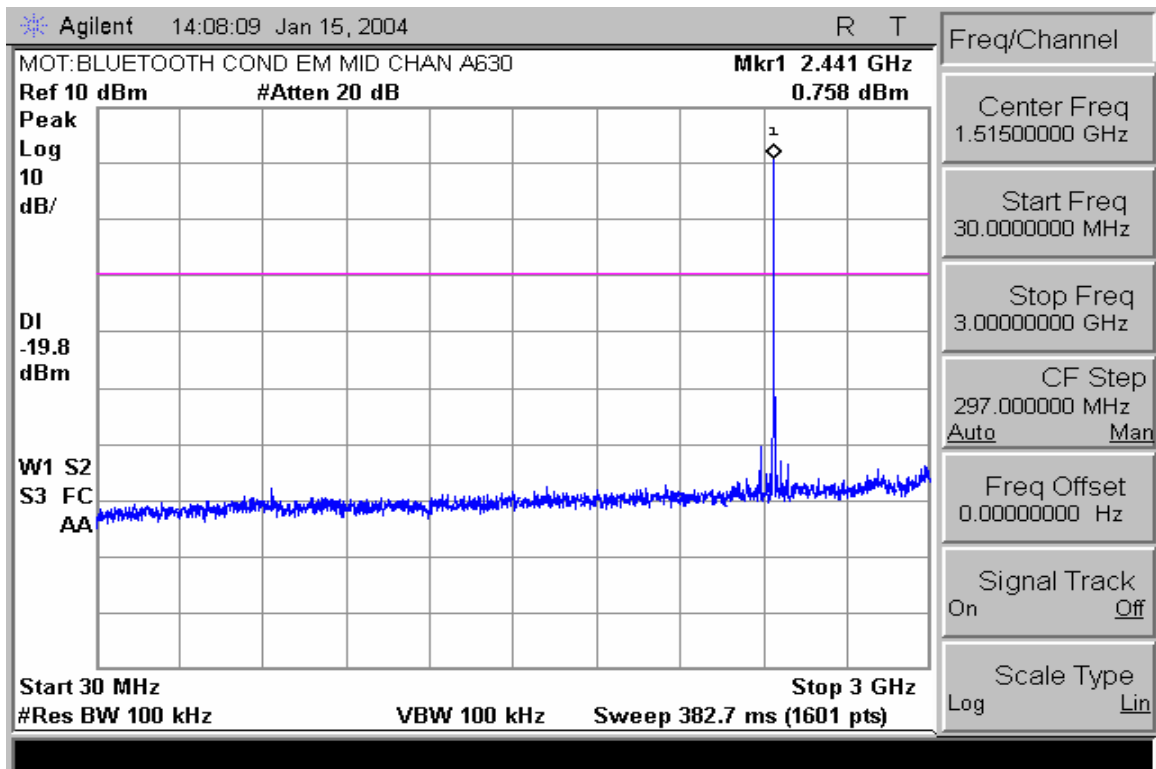




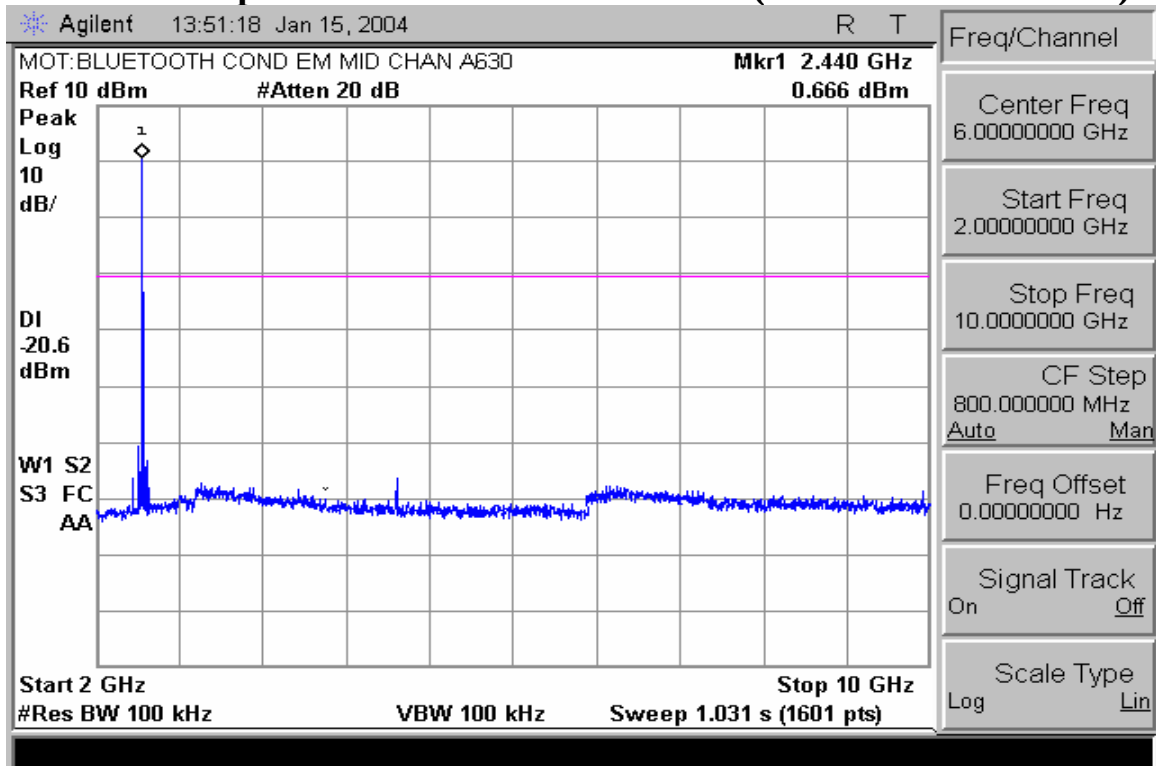
Conducted Spurious Emissions 10-20GHz (Low Channel Enabled)



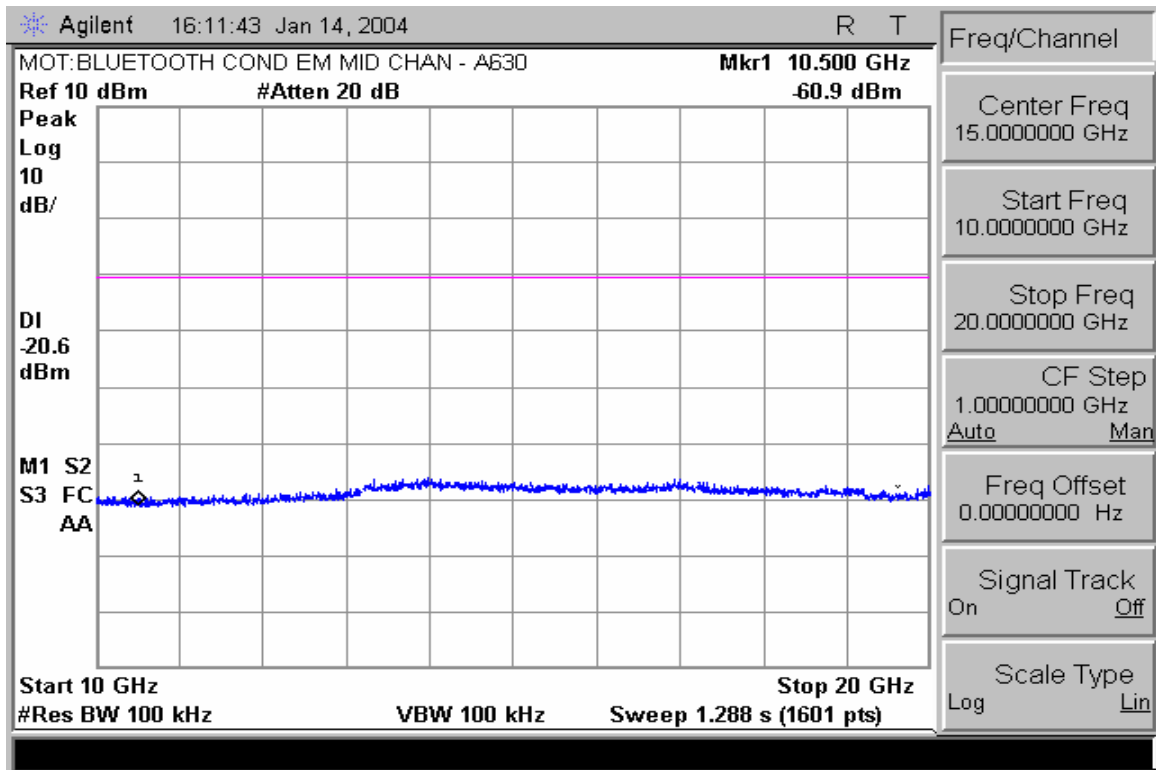
Conducted Spurious Emissions 20-26.5GHz (Low Channel Enabled)



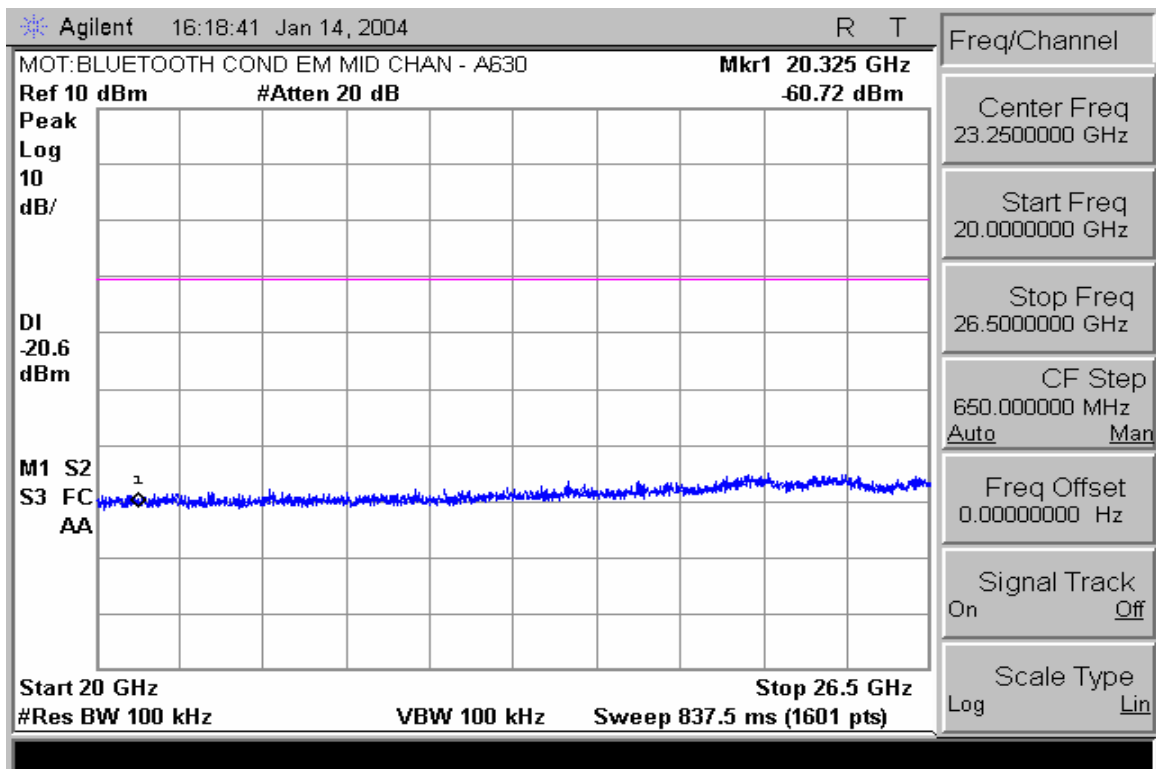
Conducted Spurious Emissions 30-3000MHz (Mid Channel Enabled)



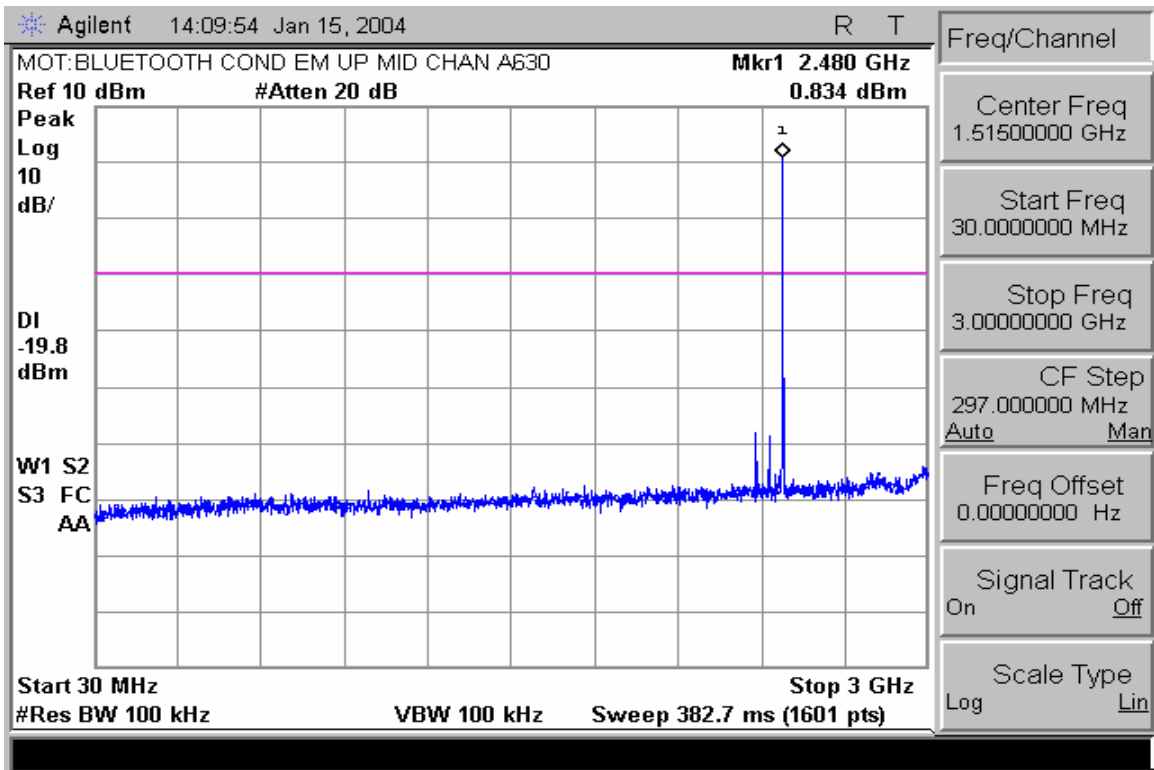
Conducted Spurious Emissions 2-10GHz (Mid Channel Enabled)



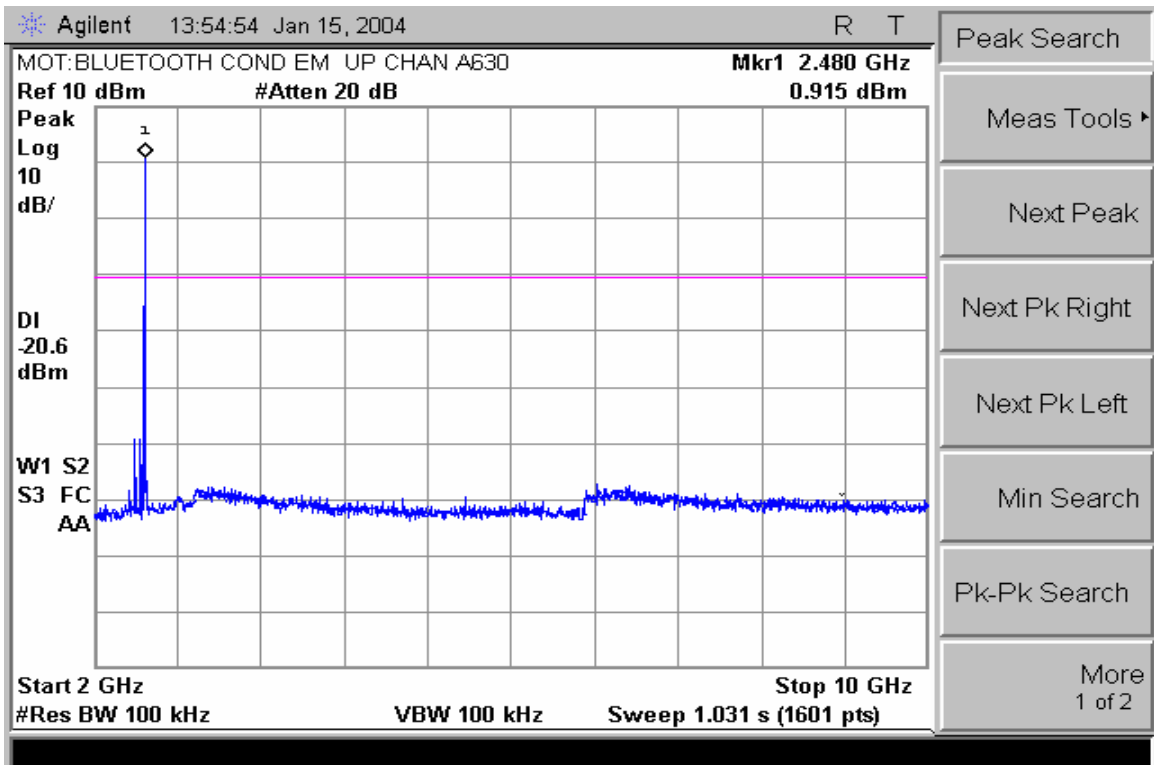
Conducted Spurious Emissions 10-20GHz (Mid Channel Enabled)



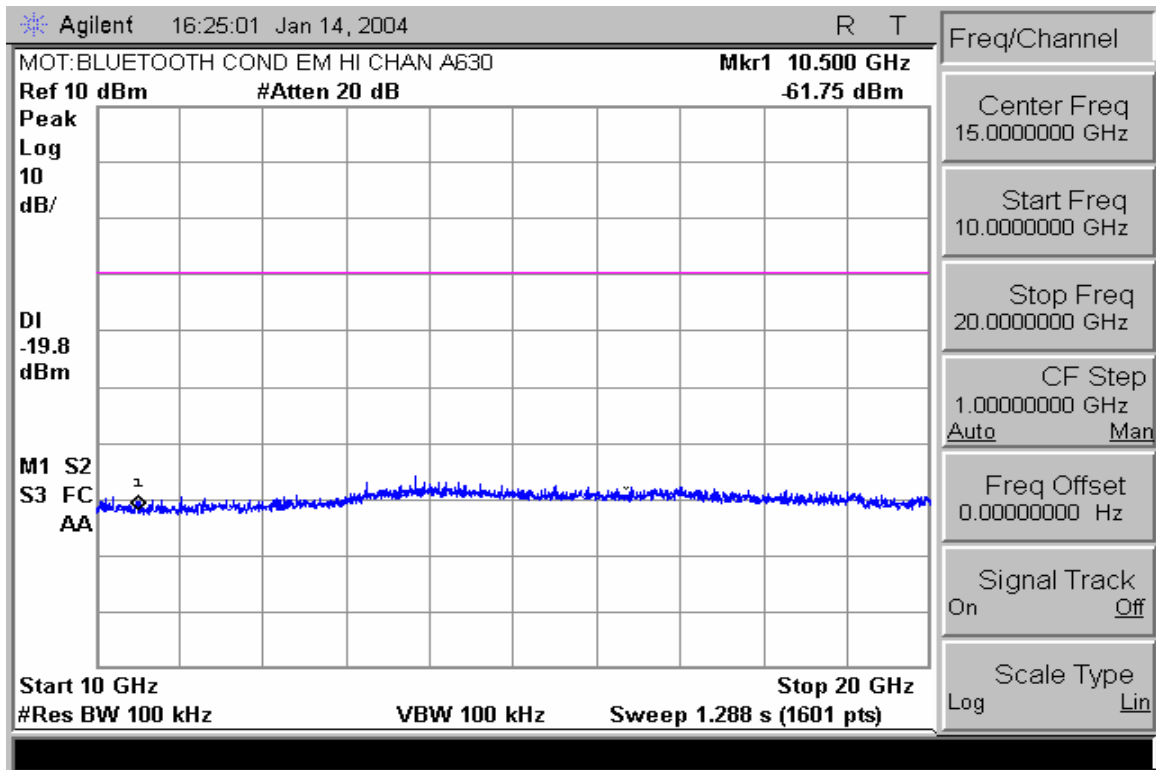
Conducted Spurious Emissions 20-26.5GHz (Mid Chan Enabled)



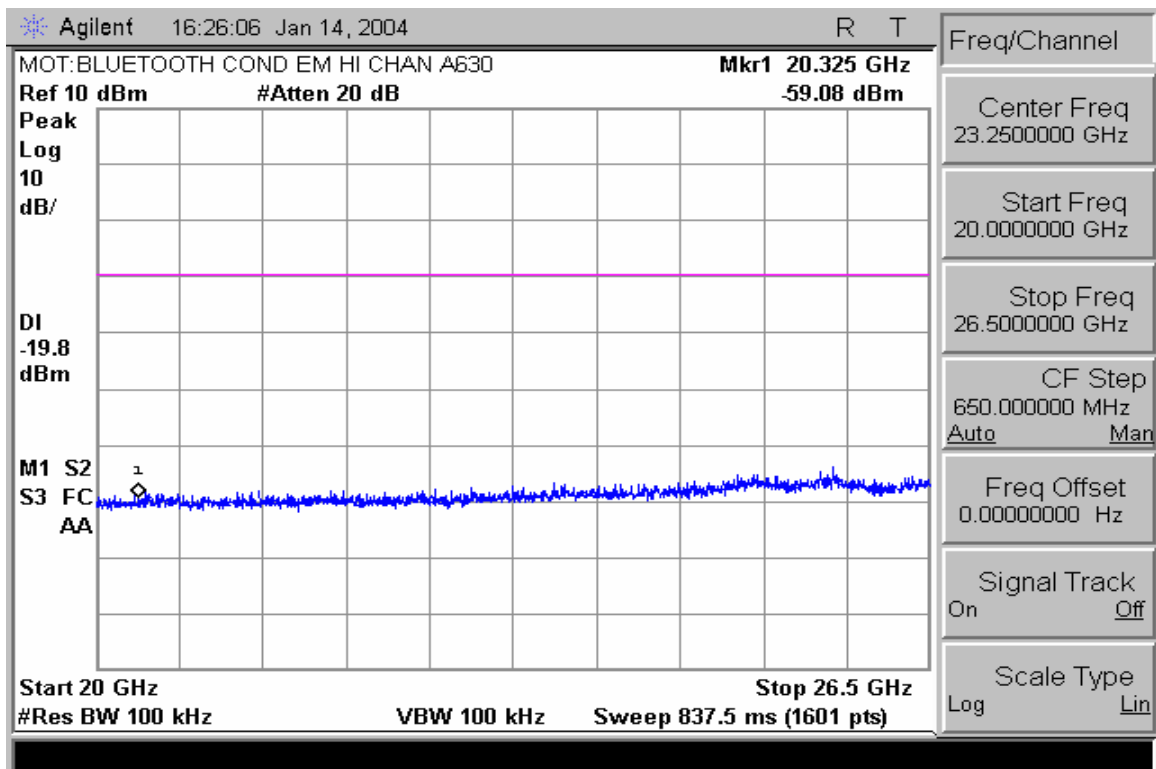
Conducted Spurious Emissions 30-3000MHz (High Channel Enabled)



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