



**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT - Addendum**

**Test Report Number** – 17263-1BT

**Report Date** – November 18, 2005

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 blue ink that reads 'Michael E. Hill'.

Signature:

Name: Michael E. Hill

Title: Senior Staff Electrical Engineer      Date: November 18, 2005

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A2LA Certificate Number: 1651.01



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**Test Report Details**

Tests Performed By: Motorola Mobile Devices business  
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.  
Mobile Devices business  
600 North US Hwy 45  
Libertyville, IL 60048

Product Type: E2 ROKR

Signaling Capability: GSM850, 1900, GPRS and Bluetooth

Model Number: CHWF1417AA

Serial Numbers: TA100004D, TA100006D

Testing Complete Date: November 11, 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    |
| 10   | AC Line Conducted Emissions          | See plots |

| Test | Test Name                            | Results   |
|------|--------------------------------------|-----------|
| 1    | Carrier Frequency Separation         | 1000 kHz  |
| 2    | Number of Hopping Frequencies        | 79        |
| 3    | Time of Occupancy (Dwell Time)       | 2.875 ms  |
| 4    | 20 dB Bandwidth                      | 1000 kHz  |
| 5    | Spurious RF Conducted Emissions      | See plots |
| 6    | Field Strength of Spurious Emissions | See plots |
| 7    | Max Power                            | 0.74 dBm  |
| 8    | Band Edges                           | See plots |
| 9    | Conducted Spurious Emissions         | See plots |
| 10   | AC line Conducted 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**

| <b>Manufacturer</b> | <b>Equipment Type</b> | <b>Model No.</b> | <b>Serial Number</b> | <b>Cal. Due Date</b> |
|---------------------|-----------------------|------------------|----------------------|----------------------|
| Rohde & Schwarz     | Receiver              | ESI26            | 838786/010           | 2/7/2006             |
| Hewlett-Packard     | EMC Analyzer          | 7405             | US39440191           | 1/27/2006            |
| ETS                 | DRG Horn Antenna      | 3115             | 6222                 | 2/9/2006             |
| A.H. Systems Inc.   | DRG Horn Antenna      | SAS-2--/571      | 365                  | 5/25/2006            |
| ETS                 | Log-Periodic Antenna  | 3148             | 1188                 | 6/14/2006            |
| ETS                 | Biconical Antenna     | 3110B            | 3370                 | 2/16/2006            |
| Attenuator          | Weinschel             | AS-6             | 6675                 | 12/27/2005           |
| Attenuator          | Weinschel             | AS-6             | 6677                 | 11/14/2006           |
| Hewlett-Packard     | Signal Generator      | 83623B           | 3844A01195           | 6/20/2006            |
| Thermotron          | Environmental Chamber | S-4              | 31580                | 1/17/2006            |
| Agilent             | Power Meter           | EE4418B          | GB40206388           | 12/5/2005            |
| Agilent             | Power Sensor          | E4412B           | US38486321           | 12/5/2005            |
| Hewlett-Packard     | Pre-Amplifier         | 8447F            | 2805A03419           | 3/24/2006            |

### **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 E2 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 -2.8 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.

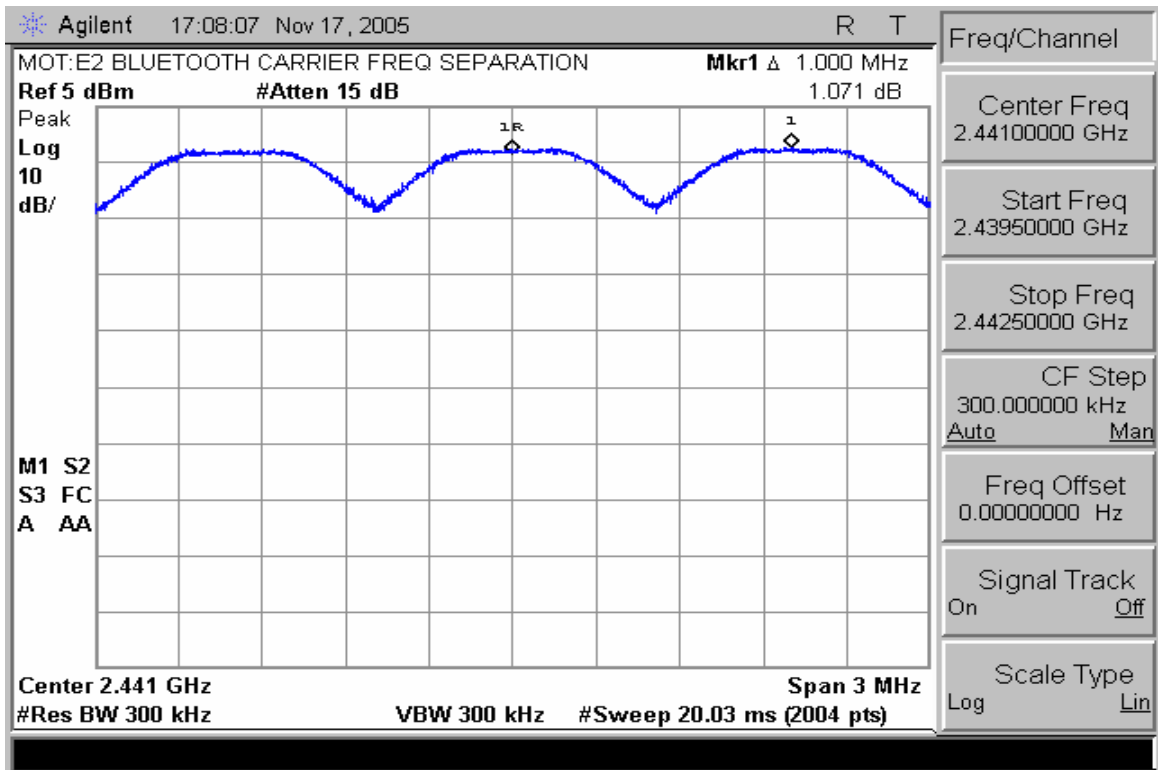
The Bluetooth transmitter of the E2 had its hopping function enabled. The following spectrum analyzer settings were used:

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.

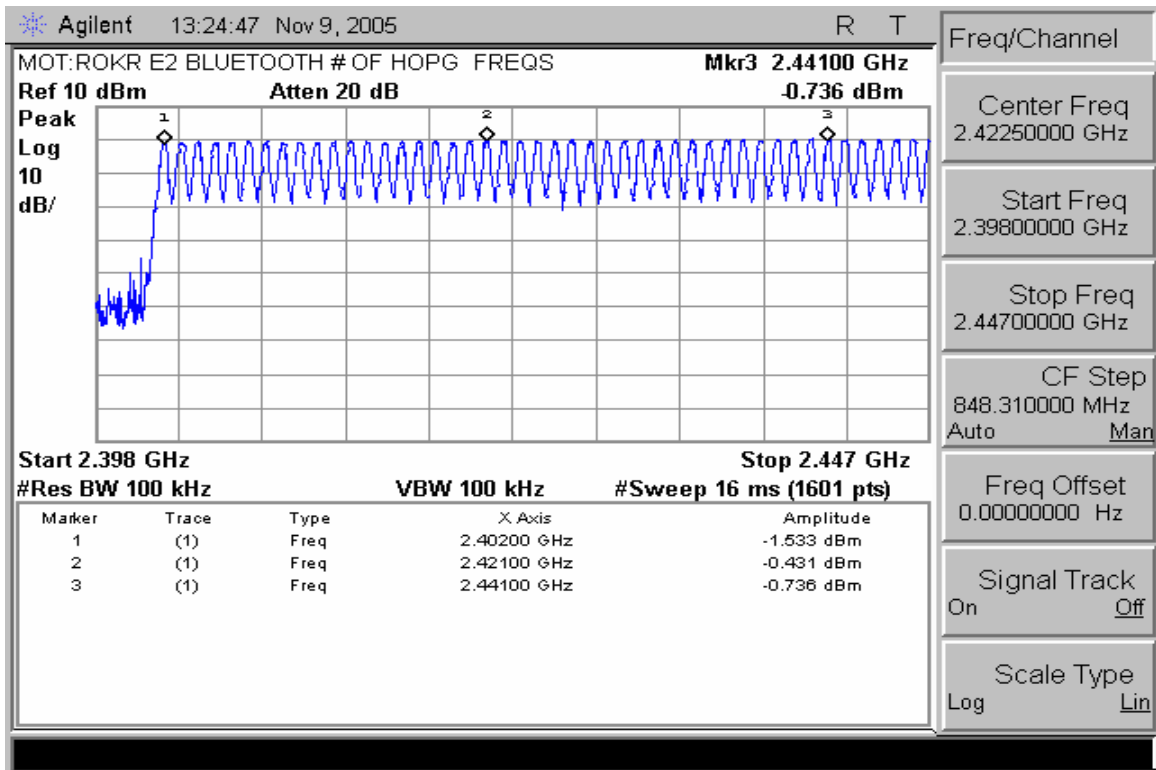
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

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

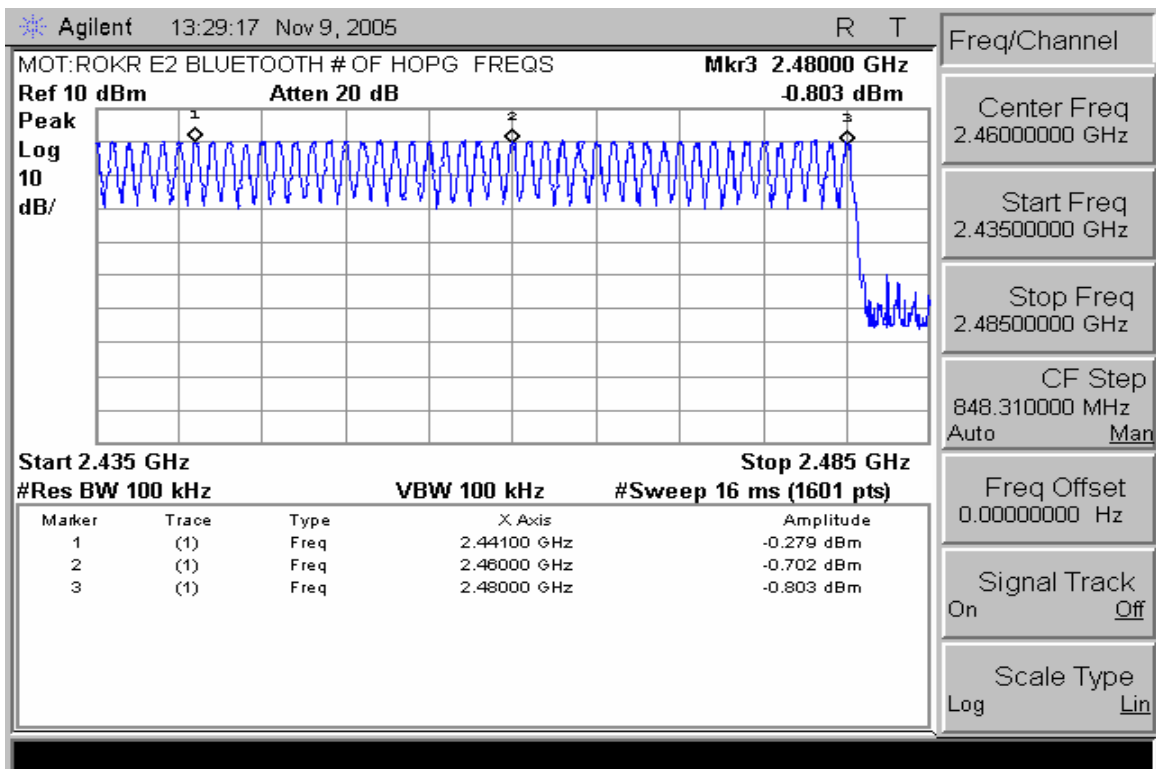
The trace was allowed to stabilize.

### **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.

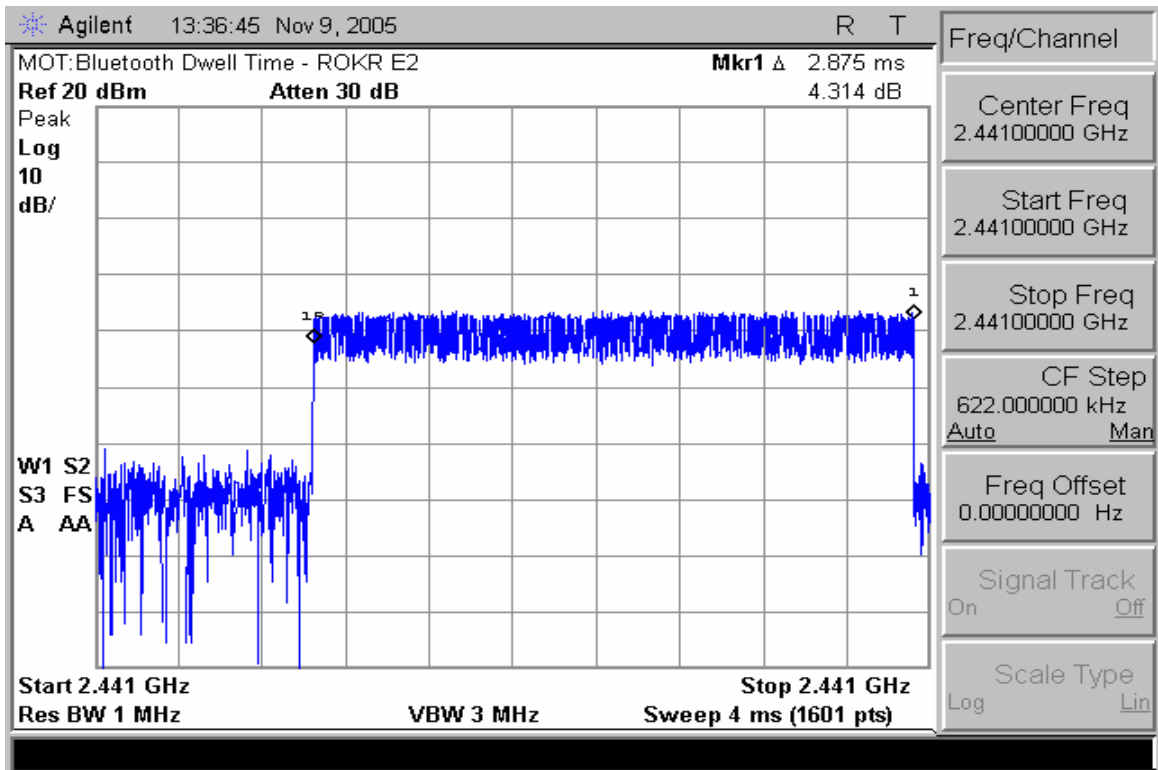
The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

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.

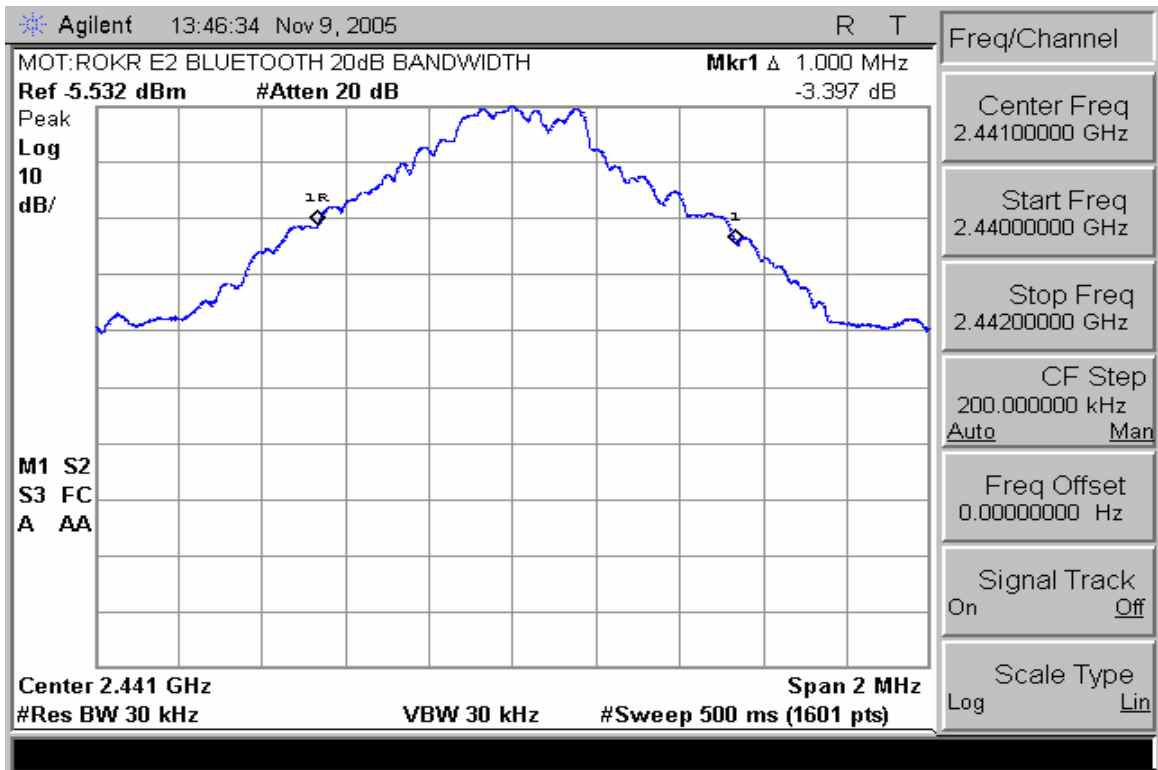
The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

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



LIMIT 2: NONE  
 LIMIT 3: NONE  
 LIMIT 4: NONE  
 LIMIT 5: NONE  
 LIMIT 6: NONE

pk - Peak detector  
 qp - Quasi-Peak detector  
 av - Average detector  
 avlg - denotes average log detection  
 ave - denotes average detection  
 tm - Trace Math Result

MOTOROLA

ROKR E2

BT CH0

AXIS - X

RED: Horizontal GRN: Vertical

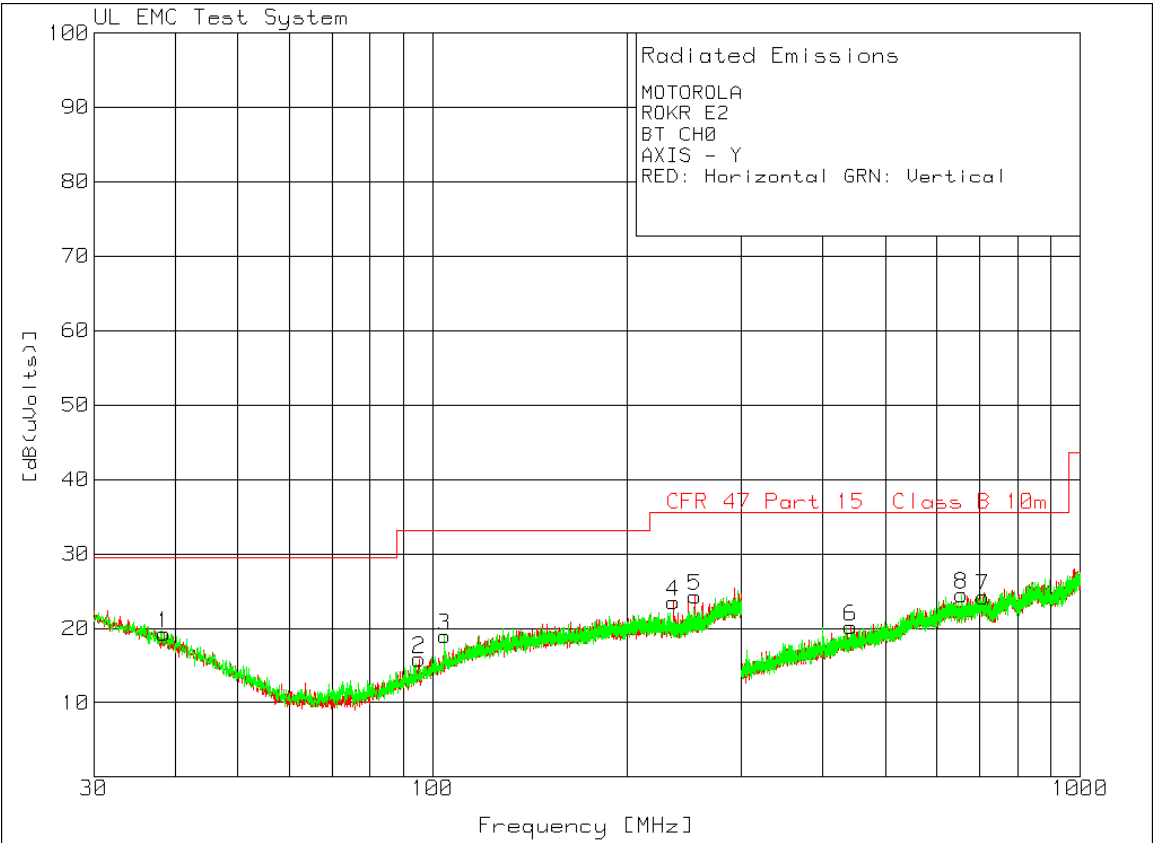
| Test      | Meter    | Gain/Loss | Transducer | Level        | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|-----------|----------|-----------|------------|--------------|---------|---|---|---|---|---|
| Frequency | Reading  | Factor    | Factor     | [dB(uVolts)] |         |   |   |   |   |   |
| [MHz]     | [dB(uV)] | [dB]      | [dB]       |              |         |   |   |   |   |   |

=====

Range 2 30 - 300MHz

|            |       |                 |       |              |       |       |   |   |   |   |   |
|------------|-------|-----------------|-------|--------------|-------|-------|---|---|---|---|---|
| 30.2       | 33.49 | pk              | -30.4 | 18           | 21.09 | 29.6  | - | - | - | - | - |
| Azimuth: 0 |       | Height:100 Vert |       | Margin [dB]: |       | -8.51 | - | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m



30-1000MHz Low Channel Dual Polarization Y

MOTOROLA

ROKR E2

BT CH0

AXIS - Y

RED: Horizontal GRN: Vertical

Test Meter Gain/Loss Transducer Level Limit:1 2 3 4 5 6

No. Frequency Reading Factor Factor [dB(uVolts)]

[MHz] [dB(uV)] [dB] [dB]

=====

=====

Range 1 30 - 300MHz -----

|   |             |            |       |             |       |      |   |   |   |   |   |
|---|-------------|------------|-------|-------------|-------|------|---|---|---|---|---|
| 1 | 38.4312     | 34.8 pk    | -30.4 | 14.9        | 19.3  | 29.6 | - | - | - | - | - |
|   | Azimuth:260 | Height:100 | Horz  | Margin [dB] | -10.3 | -    | - | - | - | - | - |
| 2 | 95.2236     | 36.1 pk    | -30.1 | 9.9         | 15.9  | 33.1 | - | - | - | - | - |
|   | Azimuth:162 | Height:100 | Horz  | Margin [dB] | -17.2 | -    | - | - | - | - | - |
| 4 | 235.2485    | 37.7 pk    | -29.7 | 15.5        | 23.5  | 35.6 | - | - | - | - | - |
|   | Azimuth:199 | Height:100 | Horz  | Margin [dB] | -12.1 | -    | - | - | - | - | - |
| 5 | 254.4716    | 37.4 pk    | -29.5 | 16.4        | 24.3  | 35.6 | - | - | - | - | - |
|   | Azimuth:224 | Height:100 | Horz  | Margin [dB] | -11.3 | -    | - | - | - | - | - |

Range 2 30 - 300MHz -----

|   |             |            |      |             |       |      |   |   |   |   |   |
|---|-------------|------------|------|-------------|-------|------|---|---|---|---|---|
| 3 | 104.3967    | 37.6 pk    | -30  | 11.4        | 19    | 33.1 | - | - | - | - | - |
|   | Azimuth:109 | Height:100 | Vert | Margin [dB] | -14.1 | -    | - | - | - | - | - |

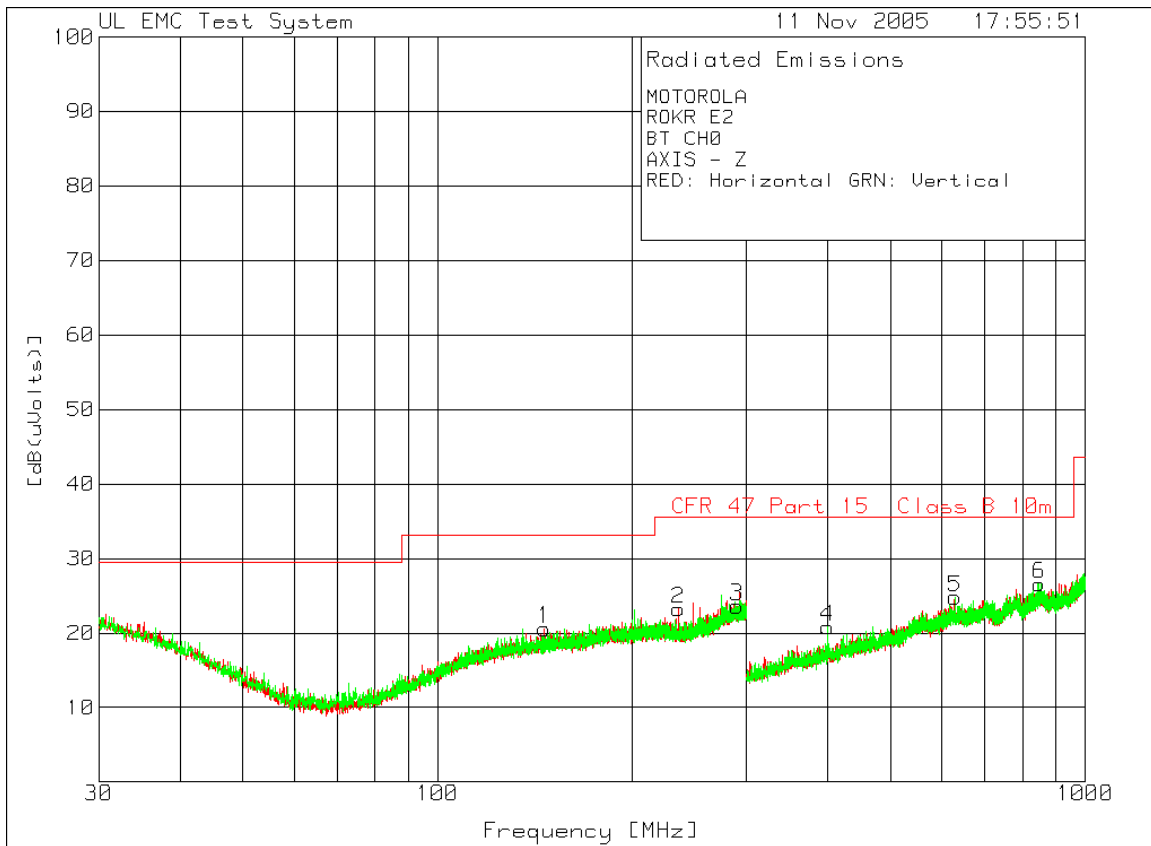
Range 3 300 - 1000MHz -----

|   |          |         |       |      |      |      |   |   |   |   |   |
|---|----------|---------|-------|------|------|------|---|---|---|---|---|
| 6 | 441.8186 | 35.7 pk | -31.9 | 16.4 | 20.2 | 35.6 | - | - | - | - | - |
|---|----------|---------|-------|------|------|------|---|---|---|---|---|

|             |          |            |    |       |      |             |      |       |   |   |   |   |   |
|-------------|----------|------------|----|-------|------|-------------|------|-------|---|---|---|---|---|
| Azimuth:194 |          | Height:100 |    | Horz  |      | Margin [dB] |      | -15.4 | - | - | - | - | - |
| 7           | 708.1438 | 34.4       | pk | -30.7 | 20.5 | 24.2        | 35.6 | -     | - | - | - | - | - |
| Azimuth:106 |          | Height:100 |    | Horz  |      | Margin [dB] |      | -11.4 | - | - | - | - | - |

|                             |         |            |    |      |      |             |      |       |   |   |   |   |
|-----------------------------|---------|------------|----|------|------|-------------|------|-------|---|---|---|---|
| Range 4 300 - 1000MHz ----- |         |            |    |      |      |             |      |       |   |   |   |   |
| 8                           | 655.858 | 35.7       | pk | -31  | 19.8 | 24.5        | 35.6 | -     | - | - | - | - |
| Azimuth:95                  |         | Height:100 |    | Vert |      | Margin [dB] |      | -11.1 | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m



### 30-1000MHz Low Channel Dual Polarization Z

MOTOROLA

ROKR E2

BT CH0

AXIS - Z

RED: Horizontal GRN: Vertical

| No. | Frequency [MHz] | Meter Reading [dB(uV)] | Gain/Loss [dB] | Transducer Factor [dB] | Level [dB(uVolts)] | Limit 1 | 2 | 3 | 4 | 5 | 6 |
|-----|-----------------|------------------------|----------------|------------------------|--------------------|---------|---|---|---|---|---|
| 1   | 146.0804        | 36.1 pk                | -30.1          | 14.6                   | 20.6               | 33.1    | - | - | - | - | - |
| 2   | 235.2485        | 37.4 pk                | -29.7          | 15.5                   | 23.2               | 35.6    | - | - | - | - | - |
| 3   | 289.7476        | 34.8 pk                | -29.3          | 18.1                   | 23.6               | 35.6    | - | - | - | - | - |
| 4   | 400.1998        | 37.2 pk                | -32            | 15.6                   | 20.8               | 35.6    | - | - | - | - | - |
| 5   | 628.9282        | 35.7 pk                | -31            | 20.1                   | 24.8               | 35.6    | - | - | - | - | - |
| 6   | 849.2629        | 35.3 pk                | -31.5          | 22.8                   | 26.6               | 35.6    | - | - | - | - | - |

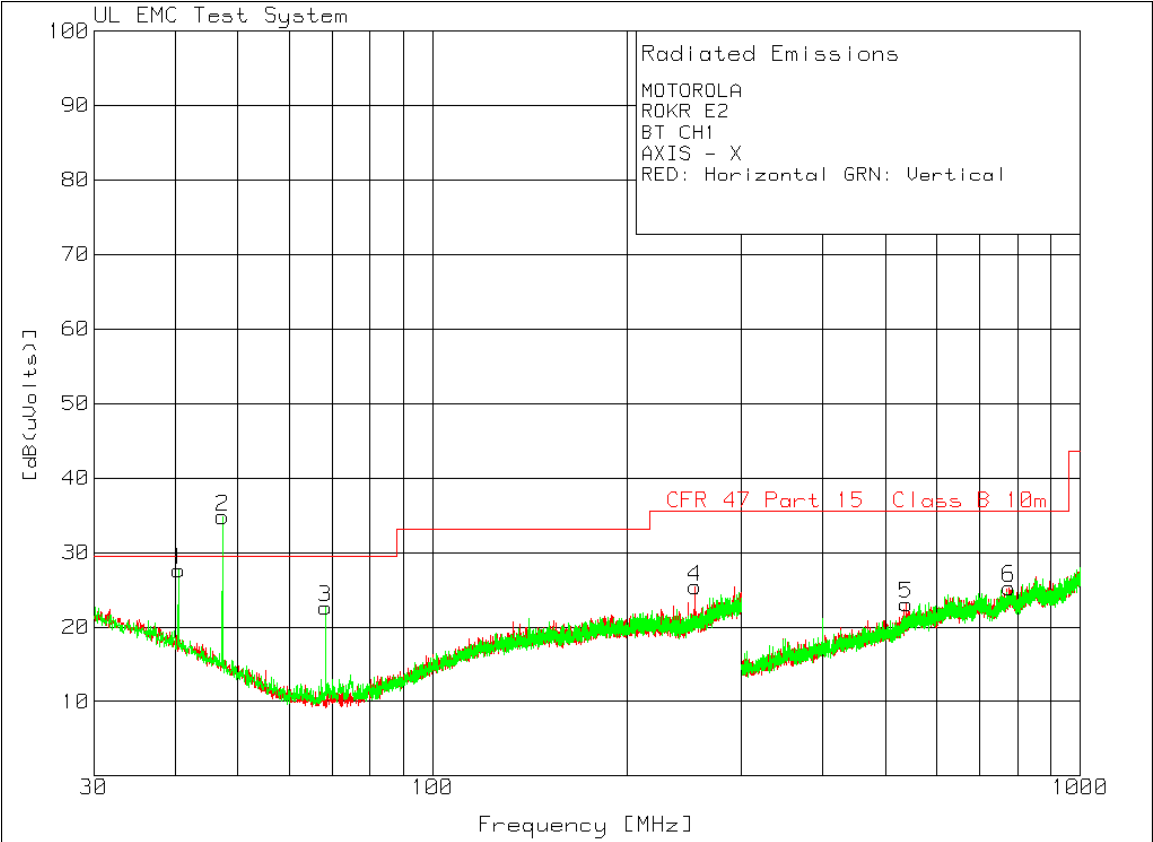
Range 1 30 - 300MHz -----

|                                         |          |         |       |      |      |      |       |   |   |   |   |
|-----------------------------------------|----------|---------|-------|------|------|------|-------|---|---|---|---|
| 1                                       | 146.0804 | 36.1 pk | -30.1 | 14.6 | 20.6 | 33.1 | -     | - | - | - | - |
| Azimuth:286 Height:100 Horz Margin [dB] |          |         |       |      |      |      | -12.5 | - | - | - | - |
| 2                                       | 235.2485 | 37.4 pk | -29.7 | 15.5 | 23.2 | 35.6 | -     | - | - | - | - |
| Azimuth:286 Height:100 Horz Margin [dB] |          |         |       |      |      |      | -12.4 | - | - | - | - |
| 3                                       | 289.7476 | 34.8 pk | -29.3 | 18.1 | 23.6 | 35.6 | -     | - | - | - | - |
| Azimuth:7 Height:100 Horz Margin [dB]   |          |         |       |      |      |      | -12   | - | - | - | - |

Range 4 300 - 1000MHz -----

|                                         |          |         |       |      |      |      |       |   |   |   |   |
|-----------------------------------------|----------|---------|-------|------|------|------|-------|---|---|---|---|
| 4                                       | 400.1998 | 37.2 pk | -32   | 15.6 | 20.8 | 35.6 | -     | - | - | - | - |
| Azimuth:249 Height:100 Vert Margin [dB] |          |         |       |      |      |      | -14.8 | - | - | - | - |
| 5                                       | 628.9282 | 35.7 pk | -31   | 20.1 | 24.8 | 35.6 | -     | - | - | - | - |
| Azimuth:5 Height:100 Vert Margin [dB]   |          |         |       |      |      |      | -10.8 | - | - | - | - |
| 6                                       | 849.2629 | 35.3 pk | -31.5 | 22.8 | 26.6 | 35.6 | -     | - | - | - | - |
| Azimuth:261 Height:100 Vert Margin [dB] |          |         |       |      |      |      | -9    | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m



30-1000MHz Mid Channel Dual Polarization X

MOTOROLA

ROKR E2

BT CH1

AXIS - X

RED: Horizontal GRN: Vertical

| Test  | Meter     | Gain/Loss | Transducer | Level  | Limit:1      | 2 | 3 | 4 | 5 | 6 |
|-------|-----------|-----------|------------|--------|--------------|---|---|---|---|---|
| No.   | Frequency | Reading   | Factor     | Factor | [dB(uVolts)] |   |   |   |   |   |
| [MHz] | [dB(uV)]  | [dB]      | [dB]       | [dB]   |              |   |   |   |   |   |

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Range 1 30 - 300MHz -----

|             |          |         |                 |      |             |      |       |   |   |   |   |
|-------------|----------|---------|-----------------|------|-------------|------|-------|---|---|---|---|
| 4           | 254.4042 | 38.5 pk | -29.5           | 16.4 | 25.4        | 35.6 | -     | - | - | - | - |
| Azimuth:181 |          |         | Height:100 Horz |      | Margin [dB] |      | -10.2 | - | - | - | - |

Range 2 30 - 300MHz -----

|             |         |         |                 |      |             |      |     |   |   |   |   |
|-------------|---------|---------|-----------------|------|-------------|------|-----|---|---|---|---|
| 1           | 40.5221 | 43.8 pk | -30.3           | 14.1 | 27.6        | 29.6 | -   | - | - | - | - |
| Azimuth:271 |         |         | Height:100 Vert |      | Margin [dB] |      | -2  | - | - | - | - |
| 2           | 47.3345 | 53.8 pk | -30.3           | 11.3 | 34.8        | 29.6 | -   | - | - | - | - |
| Azimuth:87  |         |         | Height:100 Vert |      | Margin [dB] |      | 5.2 | - | - | - | - |
| 3           | 68.3113 | 46.5 pk | -30.2           | 6.3  | 22.6        | 29.6 | -   | - | - | - | - |
| Azimuth:140 |         |         | Height:100 Vert |      | Margin [dB] |      | -7  | - | - | - | - |

Range 3 300 - 1000MHz -----

|           |          |         |                 |      |             |      |       |   |   |   |   |
|-----------|----------|---------|-----------------|------|-------------|------|-------|---|---|---|---|
| 5         | 539.0457 | 36 pk   | -31.5           | 18.6 | 23.1        | 35.6 | -     | - | - | - | - |
| Azimuth:6 |          |         | Height:100 Horz |      | Margin [dB] |      | -12.5 | - | - | - | - |
| 6         | 776.6923 | 34.7 pk | -31.1           | 21.7 | 25.3        | 35.6 | -     | - | - | - | - |
| Azimuth:0 |          |         | Height:100 Horz |      | Margin [dB] |      | -10.3 | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: NONE  
 LIMIT 3: NONE  
 LIMIT 4: NONE  
 LIMIT 5: NONE  
 LIMIT 6: NONE

pk - Peak detector  
 qp - Quasi-Peak detector  
 av - Average detector  
 avlg - denotes average log detection  
 ave - denotes average detection  
 tm - Trace Math Result

MOTOROLA

ROKR E2

BT CH1

AXIS - X

RED: Horizontal GRN: Vertical

| Test      | Meter    | Gain/Loss | Transducer | Level        | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|-----------|----------|-----------|------------|--------------|---------|---|---|---|---|---|
| Frequency | Reading  | Factor    | Factor     | [dB(uVolts)] |         |   |   |   |   |   |
| [MHz]     | [dB(uV)] | [dB]      | [dB]       |              |         |   |   |   |   |   |

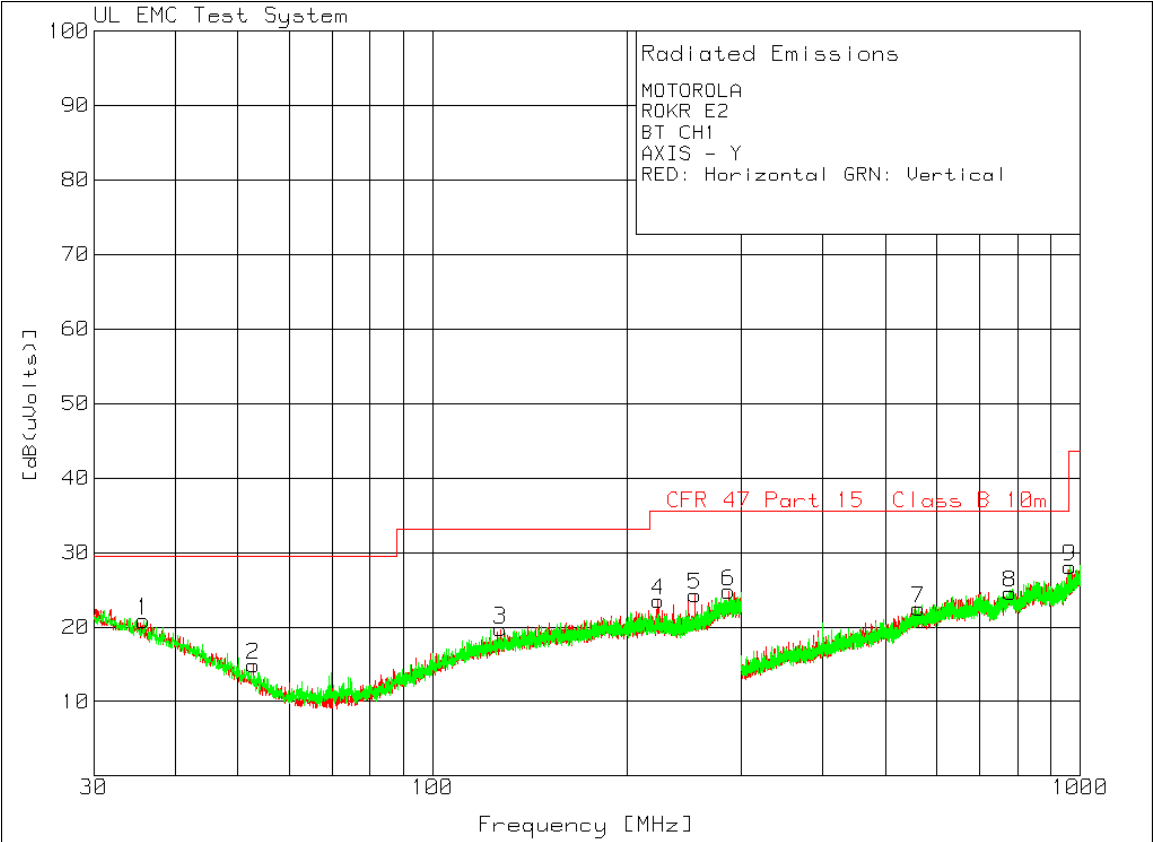
=====

Range 2 30 - 300MHz

|                            |          |       |      |                               |      |   |   |   |   |   |
|----------------------------|----------|-------|------|-------------------------------|------|---|---|---|---|---|
| 47.33                      | 33.17 pk | -30.3 | 11.3 | 14.17                         | 29.6 | - | - | - | - | - |
| Azimuth: 0 Height:100 Vert |          |       |      | Margin [dB]: -15.43 - - - - - |      |   |   |   |   |   |

|                            |          |       |      |                               |      |   |   |   |   |   |
|----------------------------|----------|-------|------|-------------------------------|------|---|---|---|---|---|
| 40.52                      | 33.28 pk | -30.3 | 14.1 | 17.08                         | 29.6 | - | - | - | - | - |
| Azimuth: 0 Height:100 Vert |          |       |      | Margin [dB]: -12.52 - - - - - |      |   |   |   |   |   |

LIMIT 1: CFR 47 Part 15 Class B 10m



30 -1000MHz Mid Channel Dual Polarization Y

MOTOROLA

ROKR E2

BT CH1

AXIS - Y

RED: Horizontal GRN: Vertical

Test Meter Gain/Loss Transducer Level Limit:1 2 3 4 5 6

No. Frequency Reading Factor Factor [dB(uVolts)]

[MHz] [dB(uV)] [dB] [dB]

=====

=====

Range 1 30 - 300MHz -----

1 35.7332 35.2 pk -30.3 16 20.9 29.6 - - - - -

Azimuth:101 Height:100 Horz Margin [dB] -8.7 - - - -

2 52.9328 36.2 pk -30.3 9 14.9 29.6 - - - - -

Azimuth:261 Height:100 Horz Margin [dB] -14.7 - - - -

3 127.1271 36 pk -30.1 13.8 19.7 33.1 - - - - -

Azimuth:200 Height:100 Horz Margin [dB] -13.4 - - - -

4 222.9727 37.2 pk -29.6 15.9 23.5 35.6 - - - - -

Azimuth:166 Height:100 Horz Margin [dB] -12.1 - - - -

5 254.4716 37.4 pk -29.5 16.4 24.3 35.6 - - - - -

Azimuth:77 Height:100 Horz Margin [dB] -11.3 - - - -

6 286.3077 36.1 pk -29.4 18.1 24.8 35.6 - - - - -

Azimuth:151 Height:100 Horz Margin [dB] -10.8 - - - -

Range 4 300 - 1000MHz -----

7 563.3524 34.6 pk -31.4 19.3 22.5 35.6 - - - - -

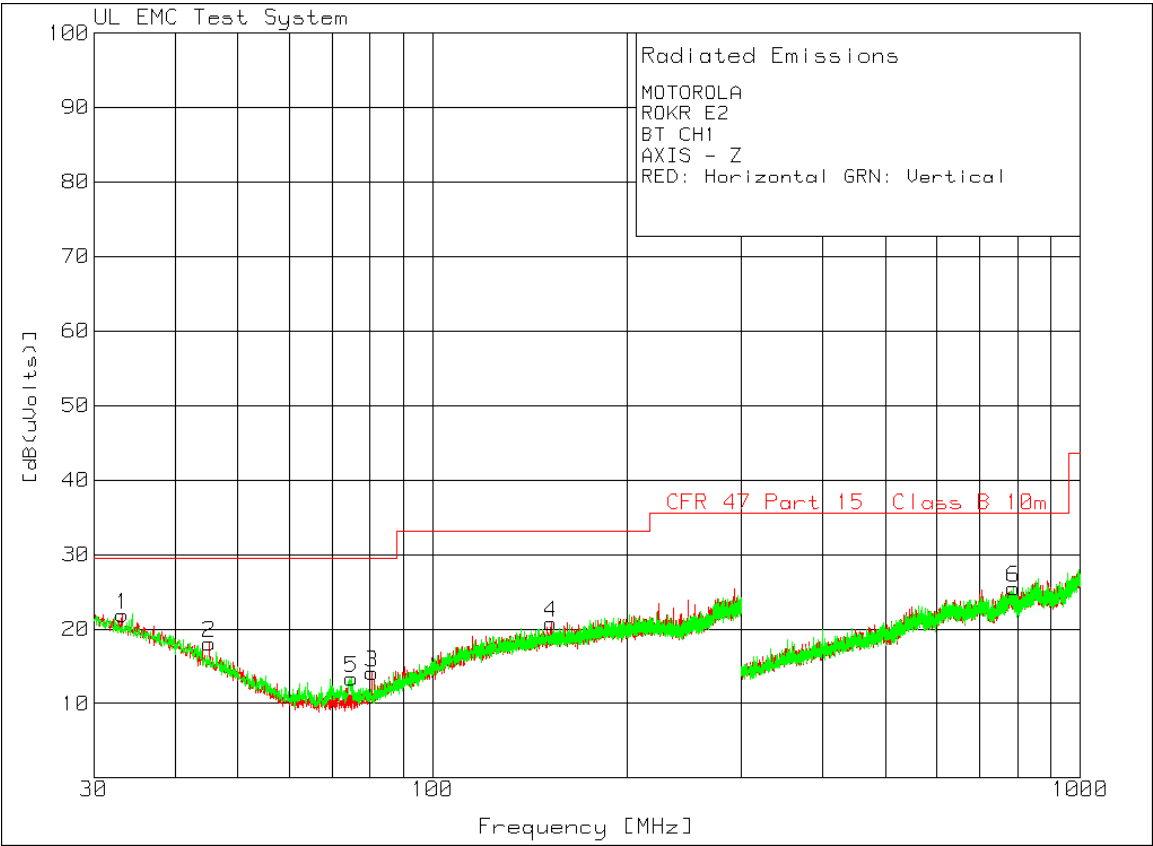
Azimuth:108 Height:100 Vert Margin [dB] -13.1 - - - -

8 780.5395 34 pk -31.4 22 24.6 35.6 - - - - -

Azimuth:173 Height:100 Vert Margin [dB] -11 - - - -

9 962.5779 36.1 pk -31.3 23.3 28.1 43.5 - - - - -  
Azimuth:146 Height:100 Vert Margin [dB] -15.4 - - - - -

LIMIT 1: CFR 47 Part 15 Class B 10m



MOTOROLA

ROKR E2

BT CH1

AXIS - Z

RED: Horizontal GRN: Vertical

Test Meter Gain/Loss Transducer Level Limit:1 2 3 4 5 6

No. Frequency Reading Factor Factor [dB(uVolts)]

[MHz] [dB(uV)] [dB] [dB]

=====

=====

Range 1 30 - 300MHz -----

1 33.1701 35.5 pk -30.4 16.8 21.9 29.6 - - - - -

Azimuth:66 Height:100 Horz Margin [dB] -7.7 - - - - -

2 45.1761 36.2 pk -30.3 12.2 18.1 29.6 - - - - -

Azimuth:78 Height:100 Horz Margin [dB] -11.5 - - - - -

3 80.5871 36.9 pk -30.2 7.4 14.1 29.6 - - - - -

Azimuth:29 Height:100 Horz Margin [dB] -15.5 - - - - -

4 152.2858 35.9 pk -30 14.9 20.8 33.1 - - - - -

Azimuth:273 Height:100 Horz Margin [dB] -12.3 - - - - -

Range 2 30 - 300MHz -----

5 74.8539 37.1 pk -30.3 6.6 13.4 29.6 - - - - -

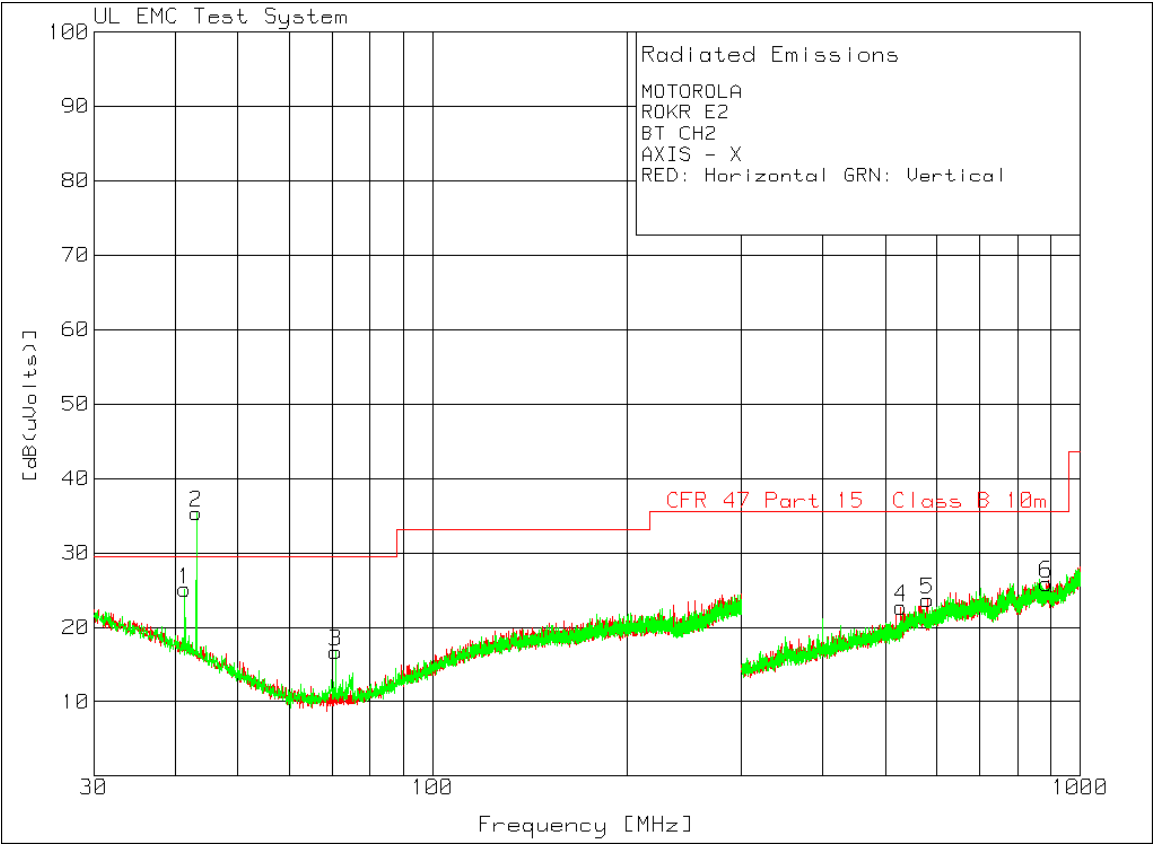
Azimuth:237 Height:100 Vert Margin [dB] -16.2 - - - - -

Range 4 300 - 1000MHz -----

6 789.108 35.2 pk -31.3 21.6 25.5 35.6 - - - - -

Azimuth:289 Height:100 Vert Margin [dB] -10.1 - - - - -

LIMIT 1: CFR 47 Part 15 Class B 10m



MOTOROLA

ROKR E2

BT CH2

AXIS - X

RED: Horizontal GRN: Vertical

Test Meter Gain/Loss Transducer Level Limit:1 2 3 4 5 6

No. Frequency Reading Factor Factor [dB(uVolts)]

[MHz] [dB(uV)] [dB] [dB]

Range 2 30 - 300MHz -----

|   |             |            |       |             |       |      |   |   |   |   |   |
|---|-------------|------------|-------|-------------|-------|------|---|---|---|---|---|
| 1 | 41.3989     | 41.6 pk    | -30.3 | 13.8        | 25.1  | 29.6 | - | - | - | - | - |
|   | Azimuth:173 | Height:100 | Vert  | Margin [dB] | -4.5  | -    | - | - | - | - | - |
| 2 | 43.1526     | 52.6 pk    | -30.3 | 13.1        | 35.4  | 29.6 | - | - | - | - | - |
|   | Azimuth:101 | Height:100 | Vert  | Margin [dB] | 5.8   | -    | - | - | - | - | - |
| 3 | 70.8069     | 40.5 pk    | -30.2 | 6.4         | 16.7  | 29.6 | - | - | - | - | - |
|   | Azimuth:356 | Height:100 | Vert  | Margin [dB] | -12.9 | -    | - | - | - | - | - |

Range 3 300 - 1000MHz -----

|   |             |            |       |             |       |      |   |   |   |   |   |
|---|-------------|------------|-------|-------------|-------|------|---|---|---|---|---|
| 4 | 528.7284    | 36.4 pk    | -31.7 | 18          | 22.7  | 35.6 | - | - | - | - | - |
|   | Azimuth:39  | Height:100 | Horz  | Margin [dB] | -12.9 | -    | - | - | - | - | - |
| 5 | 580.8393    | 36 pk      | -31.3 | 19          | 23.7  | 35.6 | - | - | - | - | - |
|   | Azimuth:341 | Height:100 | Horz  | Margin [dB] | -11.9 | -    | - | - | - | - | - |
| 6 | 886.51      | 35.1 pk    | -31.6 | 22.4        | 25.9  | 35.6 | - | - | - | - | - |
|   | Azimuth:273 | Height:100 | Horz  | Margin [dB] | -9.7  | -    | - | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m

MOTOROLA

ROKR E2

BT CH2

AXIS - X

RED: Horizontal GRN: Vertical

| Test      | Meter    | Gain/Loss | Transducer | Level        | Limit:1 | 2 | 3 | 4 | 5 | 6 |
|-----------|----------|-----------|------------|--------------|---------|---|---|---|---|---|
| Frequency | Reading  | Factor    | Factor     | [dB(uVolts)] |         |   |   |   |   |   |
| [MHz]     | [dB(uV)] | [dB]      | [dB]       |              |         |   |   |   |   |   |

Range 2 30 - 300MHz

|            |       |                 |       |              |       |        |   |   |   |   |
|------------|-------|-----------------|-------|--------------|-------|--------|---|---|---|---|
| 43.15      | 33.06 | pk              | -30.3 | 13.1         | 15.86 | 29.6   | - | - | - | - |
| Azimuth: 0 |       | Height:100 Vert |       | Margin [dB]: |       | -13.74 | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

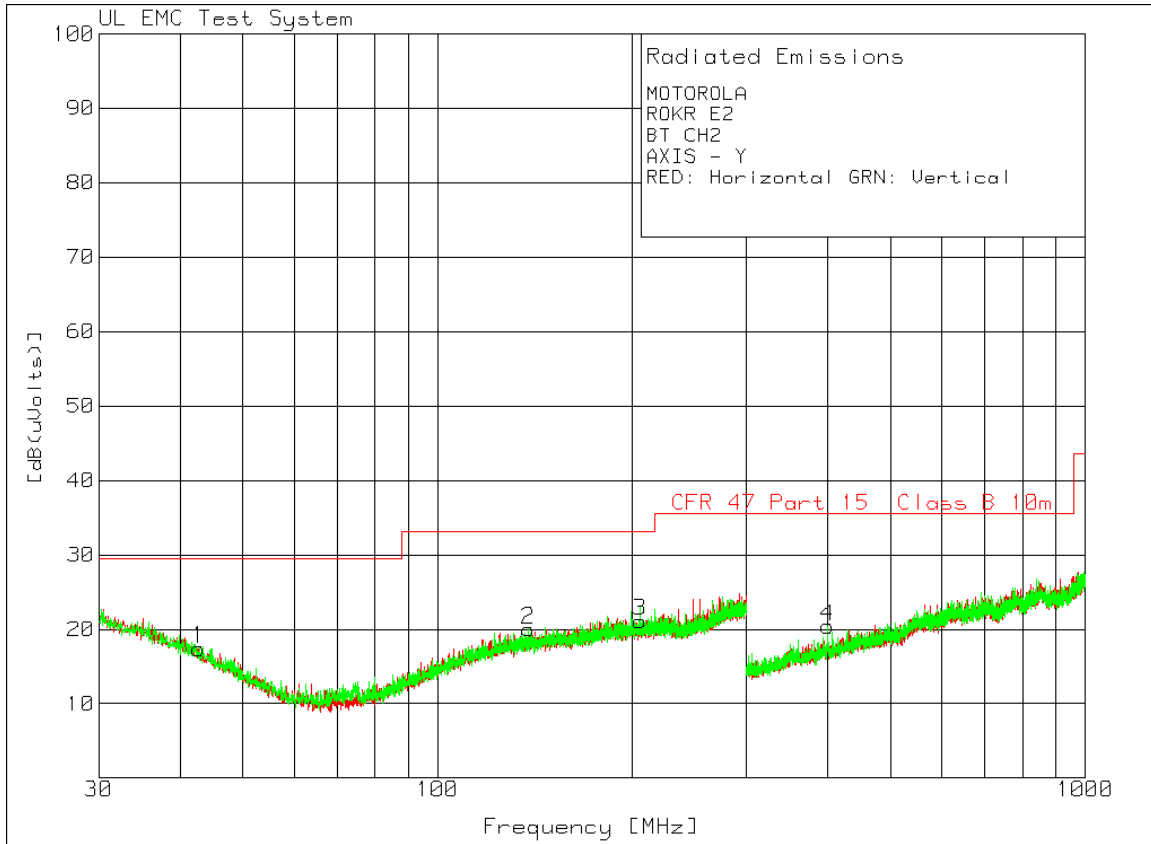
pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - Average log detector

ave - Average detector



### 30 -1000MHz High Channel Dual Polarization Y

MOTOROLA

ROKR E2

BT CH2

AXIS - Y

RED: Horizontal GRN: Vertical

| Test No. | Meter           | Gain/Loss        | Transducer  | Level       | Limit:1      | 2 | 3 | 4 | 5 | 6 |
|----------|-----------------|------------------|-------------|-------------|--------------|---|---|---|---|---|
| No.      | Frequency [MHz] | Reading [dB(uV)] | Factor [dB] | Factor [dB] | [dB(uVolts)] |   |   |   |   |   |
| =====    |                 |                  |             |             |              |   |   |   |   |   |

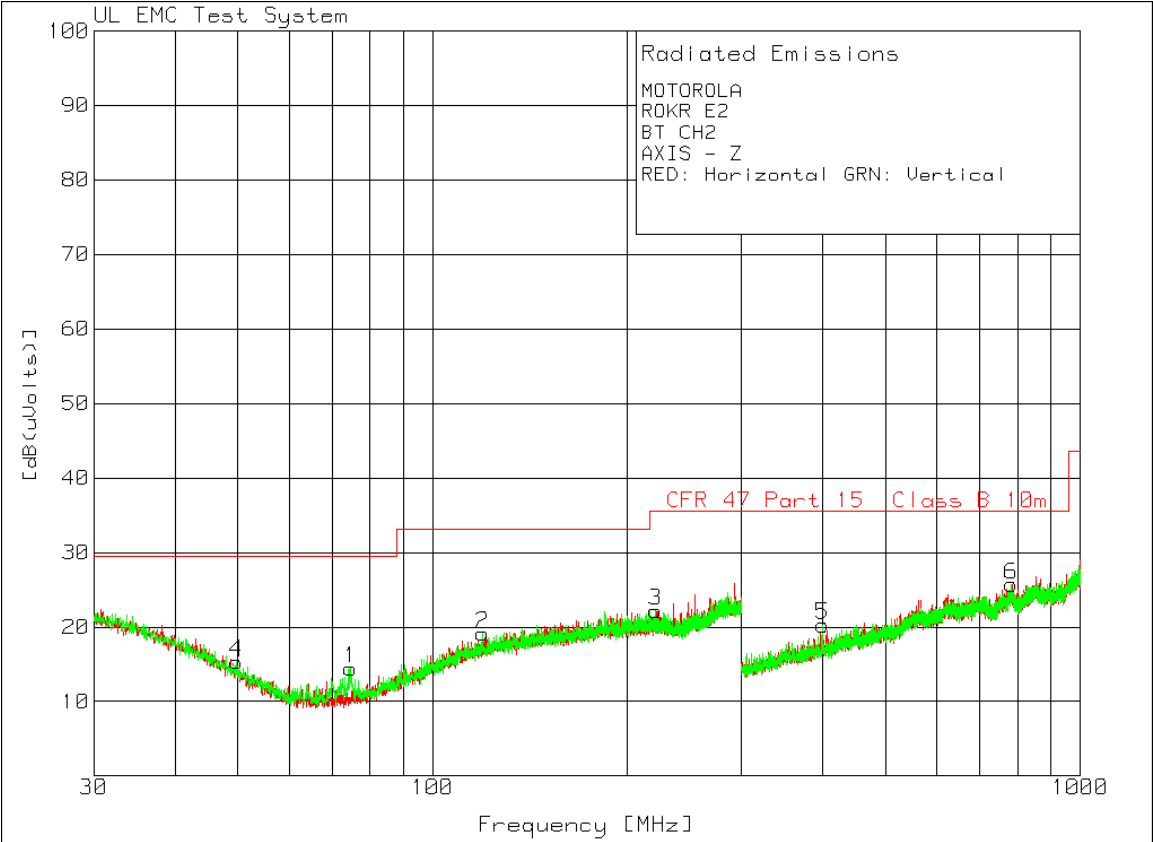
Range 1 30 - 300MHz -----

|                                                         |          |         |       |      |      |      |   |   |   |   |
|---------------------------------------------------------|----------|---------|-------|------|------|------|---|---|---|---|
| 1                                                       | 42.7479  | 34.5 pk | -30.3 | 13.2 | 17.4 | 29.6 | - | - | - | - |
| Azimuth:142 Height:100 Horz Margin [dB] -12.2 - - - - - |          |         |       |      |      |      |   |   |   |   |
| 2                                                       | 138.2563 | 35.8 pk | -30.1 | 14.3 | 20   | 33.1 | - | - | - | - |
| Azimuth:150 Height:100 Horz Margin [dB] -13.1 - - - - - |          |         |       |      |      |      |   |   |   |   |
| 3                                                       | 205.0312 | 35.1 pk | -29.8 | 15.8 | 21.1 | 33.1 | - | - | - | - |
| Azimuth:68 Height:100 Horz Margin [dB] -12 - - - - -    |          |         |       |      |      |      |   |   |   |   |

Range 4 300 - 1000MHz -----

|                                                         |          |         |     |      |      |      |   |   |   |   |
|---------------------------------------------------------|----------|---------|-----|------|------|------|---|---|---|---|
| 4                                                       | 400.1998 | 36.8 pk | -32 | 15.6 | 20.4 | 35.6 | - | - | - | - |
| Azimuth:211 Height:100 Vert Margin [dB] -15.2 - - - - - |          |         |     |      |      |      |   |   |   |   |

LIMIT 1: CFR 47 Part 15 Class B 10m



MOTOROLA

ROKR E2

BT CH2

AXIS - Z

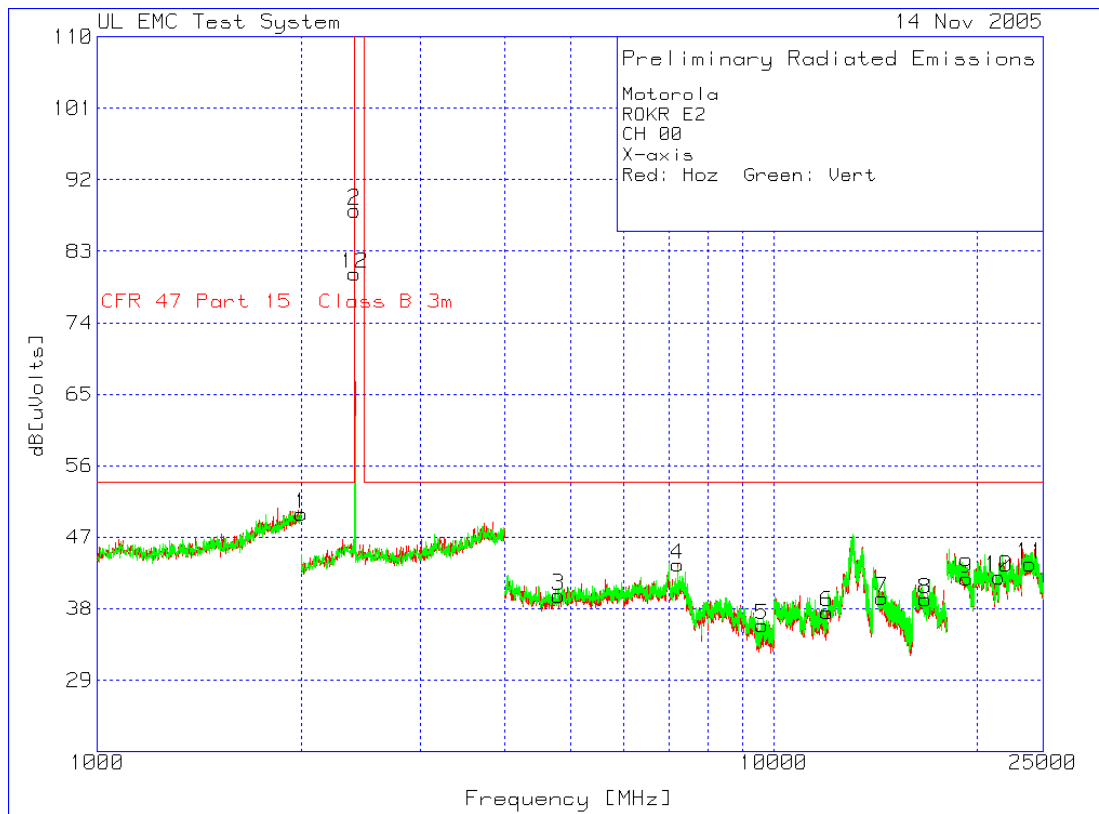
RED: Horizontal GRN: Vertical

Test Meter Gain/Loss Transducer Level Limit:1 2 3 4 5 6  
 No. Frequency Reading Factor Factor [dB(uVolts)]  
 [MHz] [dB(uV)] [dB] [dB]

| Range 2 30 - 300MHz ----- |             |         |            |      |             |       |   |   |   |   |
|---------------------------|-------------|---------|------------|------|-------------|-------|---|---|---|---|
| 1                         | 74.719      | 38.1 pk | -30.3      | 6.6  | 14.4        | 29.6  | - | - | - | - |
|                           | Azimuth:229 |         | Height:100 | Vert | Margin [dB] | -15.2 | - | - | - | - |
| 2                         | 119.5728    | 35.9 pk | -30        | 13.2 | 19.1        | 33.1  | - | - | - | - |
|                           | Azimuth:0   |         | Height:100 | Vert | Margin [dB] | -14   | - | - | - | - |
| 3                         | 220.8818    | 36 pk   | -29.7      | 15.9 | 22.2        | 35.6  | - | - | - | - |
|                           | Azimuth:19  |         | Height:100 | Vert | Margin [dB] | -13.4 | - | - | - | - |
| 4                         | 49.8301     | 35.4 pk | -30.3      | 10.2 | 15.3        | 29.6  | - | - | - | - |
|                           | Azimuth:242 |         | Height:100 | Vert | Margin [dB] | -14.3 | - | - | - | - |

| Range 4 300 - 1000MHz ----- |             |         |            |      |             |       |   |   |   |   |
|-----------------------------|-------------|---------|------------|------|-------------|-------|---|---|---|---|
| 5                           | 400.1998    | 36.7 pk | -32        | 15.6 | 20.3        | 35.6  | - | - | - | - |
|                             | Azimuth:162 |         | Height:100 | Vert | Margin [dB] | -15.3 | - | - | - | - |
| 6                           | 782.9876    | 35.1 pk | -31.3      | 21.9 | 25.7        | 35.6  | - | - | - | - |
|                             | Azimuth:168 |         | Height:100 | Vert | Margin [dB] | -9.9  | - | - | - | - |

LIMIT 1: CFR 47 Part 15 Class B 10m



## 1-25 GHz Low Channel Dual Polarization X

Motorola

CH 00

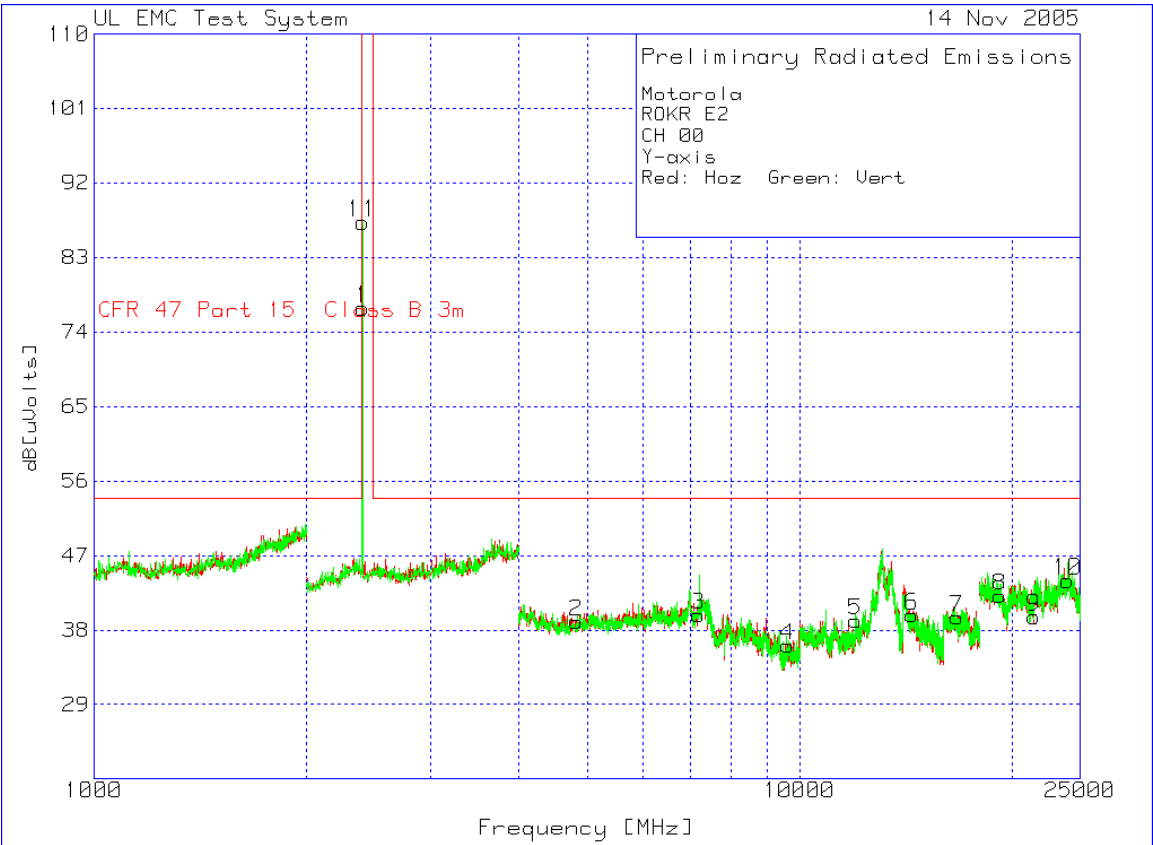
X-axis

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] | Height [cm] | Polarity |
|------------------------------------|----------------------|------------------------|---------------|-----------------------|------------------------|------------------|---------|--------------|-------------|----------|
| <b>1 - 2GHz 1000 - 2000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                  | 2000                 | 18.23                  | pk            | 3.9                   | 27.8                   | 49.93            | 54      | -4.07        | 100         | Horz     |
| <b>2 - 4GHz 2000 - 4000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                  | 2400.802             | 61.94                  | pk            | 4.4                   | 21.8                   | 88.14            | 999     | -910.86      | 100         | Horz     |
| <b>4 - 8GHz 4000 - 8000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 3                                  | 4804.805             | 62.59                  | pk            | -50.6                 | 27.7                   | 39.69            | 54      | -14.31       | 100         | Horz     |
| 4                                  | 7207.207             | 60.66                  | pk            | -46.9                 | 29.8                   | 43.56            | 54      | -10.44       | 100         | Horz     |
| <b>8 - 12GHz 8000 - 12000MHz</b>   |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                  | 9605.606             | 48.64                  | pk            | -49.1                 | 36.4                   | 35.94            | 54      | -18.06       | 100         | Horz     |
| 6                                  | 11995.996            | 45.18                  | pk            | -45.1                 | 37.5                   | 37.58            | 54      | -16.42       | 100         | Horz     |
| <b>12 - 18GHz 12000 - 18000MHz</b> |                      |                        |               |                       |                        |                  |         |              |             |          |
| 7                                  | 14445.63             | 40.35                  | pk            | -40.8                 | 39.8                   | 39.35            | 54      | -14.65       | 100         | Horz     |
| 8                                  | 16751.167            | 40.09                  | pk            | -41                   | 40.1                   | 39.19            | 54      | -14.81       | 100         | Horz     |
| <b>18-26.5GHz 18000 - 25000MHz</b> |                      |                        |               |                       |                        |                  |         |              |             |          |
| 9                                  | 19250.125            | 70.1                   | pk            | -68.6                 | 40.3                   | 41.8             | 54      | -12.2        | 100         | Horz     |
| 10                                 | 21501.751            | 63.48                  | pk            | -61.8                 | 40.3                   | 41.98            | 54      | -12.02       | 100         | Horz     |
| 11                                 | 23910.956            | 61.33                  | pk            | -58                   | 40.3                   | 43.63            | 54      | -10.37       | 100         | Horz     |
| <b>2 - 4GHz 2000 - 4000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 12                                 | 2400.802             | 53.95                  | pk            | 4.4                   | 21.8                   | 80.15            | 999     | -918.85      | 100         | Vert     |

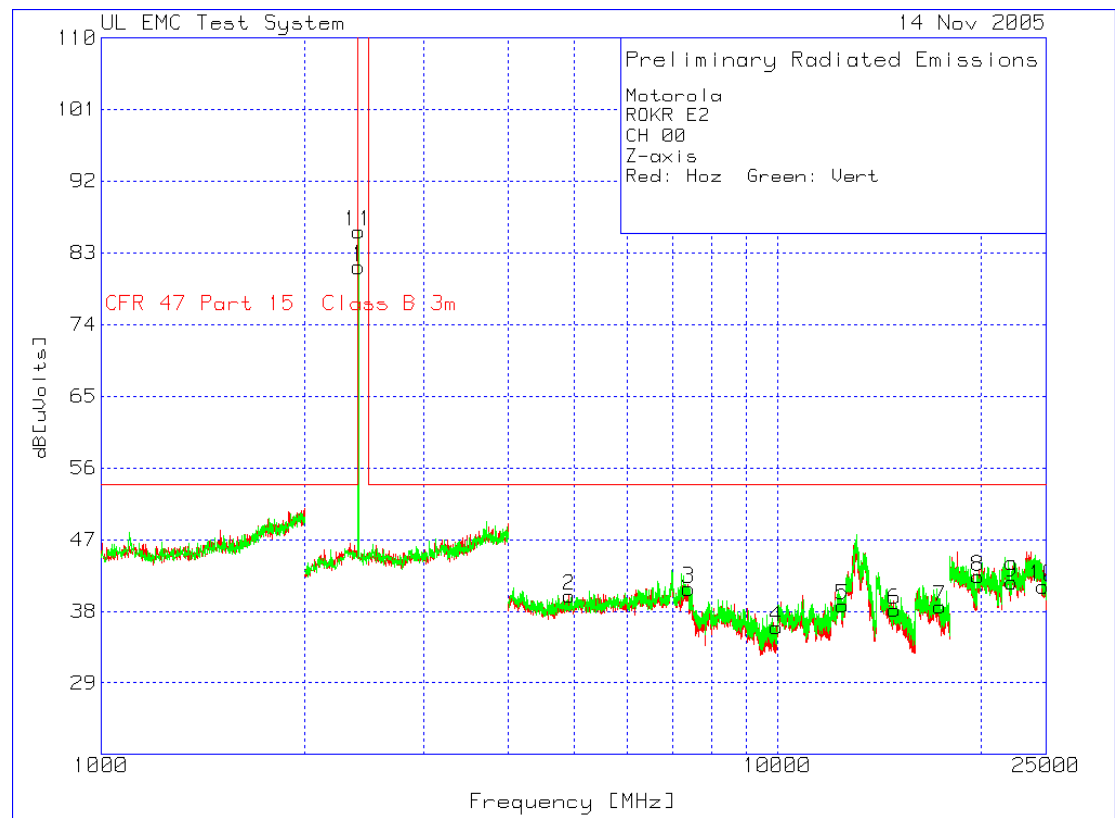
LIMIT 1: CFR 47 Part 15 Class B 3m

LIMIT 2: NONE



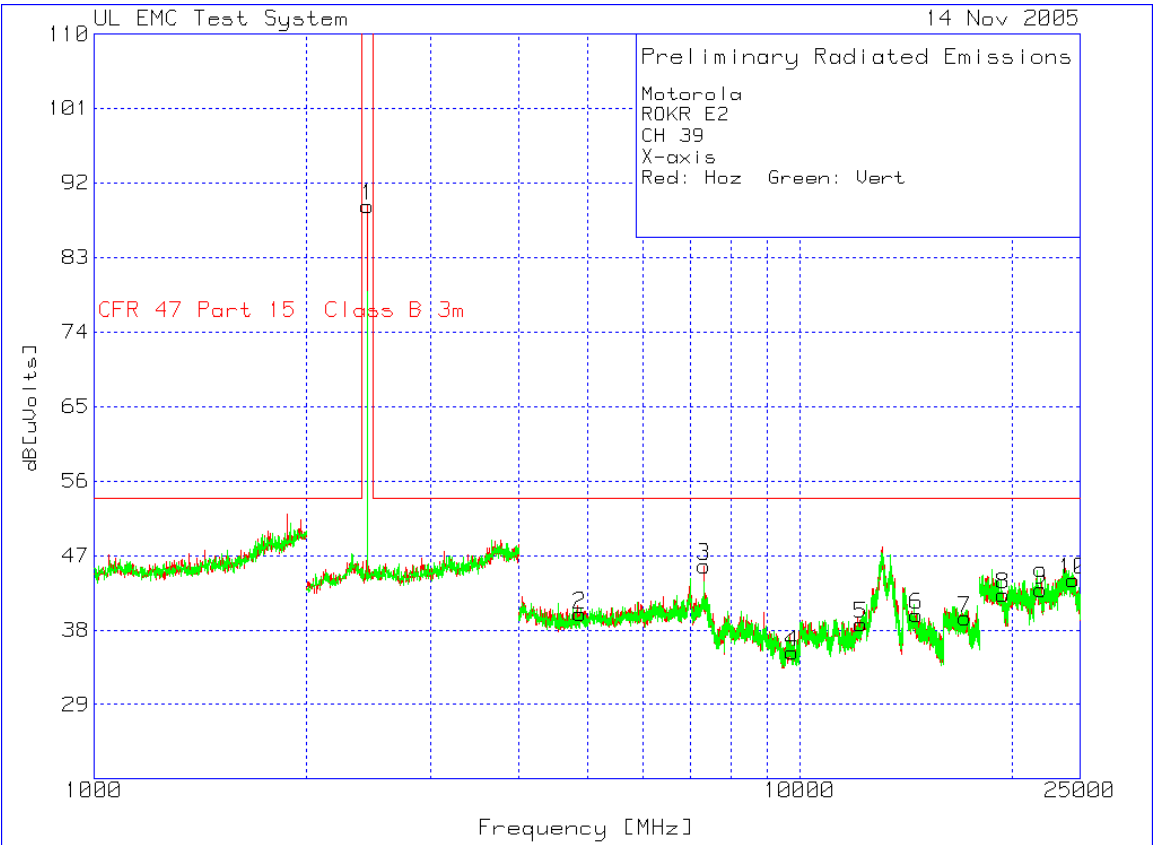
1-25 GHz Low Channel Dual Polarization Y

| Motorola<br>ROKR E2<br>CH 00<br>Y-axis<br>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] | Height [cm] | Polarity |
| 2 - 4GHz 2000 - 4000MHz                                        |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                                              | 2400.802             | 50.7 pk                |               | 4.4                   | 21.8                   | 76.9             | 999     | -922.1       | 100         | Horz     |
| 4 - 8GHz 4000 - 8000MHz                                        |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                                              | 4820.821             | 61.88 pk               |               | -50.6                 | 27.7                   | 38.98            | 54      | -15.02       | 100         | Horz     |
| 3                                                              | 7195.195             | 57.1 pk                |               | -47                   | 29.7                   | 39.8             | 54      | -14.2        | 100         | Horz     |
| 8 - 12GHz 8000 - 12000MHz                                      |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                                              | 9629.63              | 48.55 pk               |               | -48.8                 | 36.4                   | 36.15            | 54      | -17.85       | 100         | Horz     |
| 12 - 18GHz 12000 - 18000MHz                                    |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                                              | 12016.011            | 45.25 pk               |               | -45.5                 | 39.4                   | 39.15            | 54      | -14.85       | 100         | Horz     |
| 6                                                              | 14433.622            | 40.88 pk               |               | -40.9                 | 39.8                   | 39.78            | 54      | -14.22       | 100         | Horz     |
| 7                                                              | 16731.154            | 40.45 pk               |               | -40.9                 | 40                     | 39.55            | 54      | -14.45       | 100         | Horz     |
| 18-26.5GHz 18000 - 25000MHz                                    |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                                              | 19229.115            | 70.32 pk               |               | -68.5                 | 40.3                   | 42.12            | 54      | -11.88       | 100         | Horz     |
| 9                                                              | 21491.246            | 61.23 pk               |               | -61.9                 | 40.3                   | 39.63            | 54      | -14.37       | 100         | Horz     |
| 10                                                             | 23987.994            | 62.47 pk               |               | -58.8                 | 40.3                   | 43.97            | 54      | -10.03       | 100         | Horz     |
| 2 - 4GHz 2000 - 4000MHz                                        |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                                             | 2400.802             | 61.04 pk               |               | 4.4                   | 21.8                   | 87.24            | 999     | -911.76      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: NONE            |                      |                        |               |                       |                        |                  |         |              |             |          |



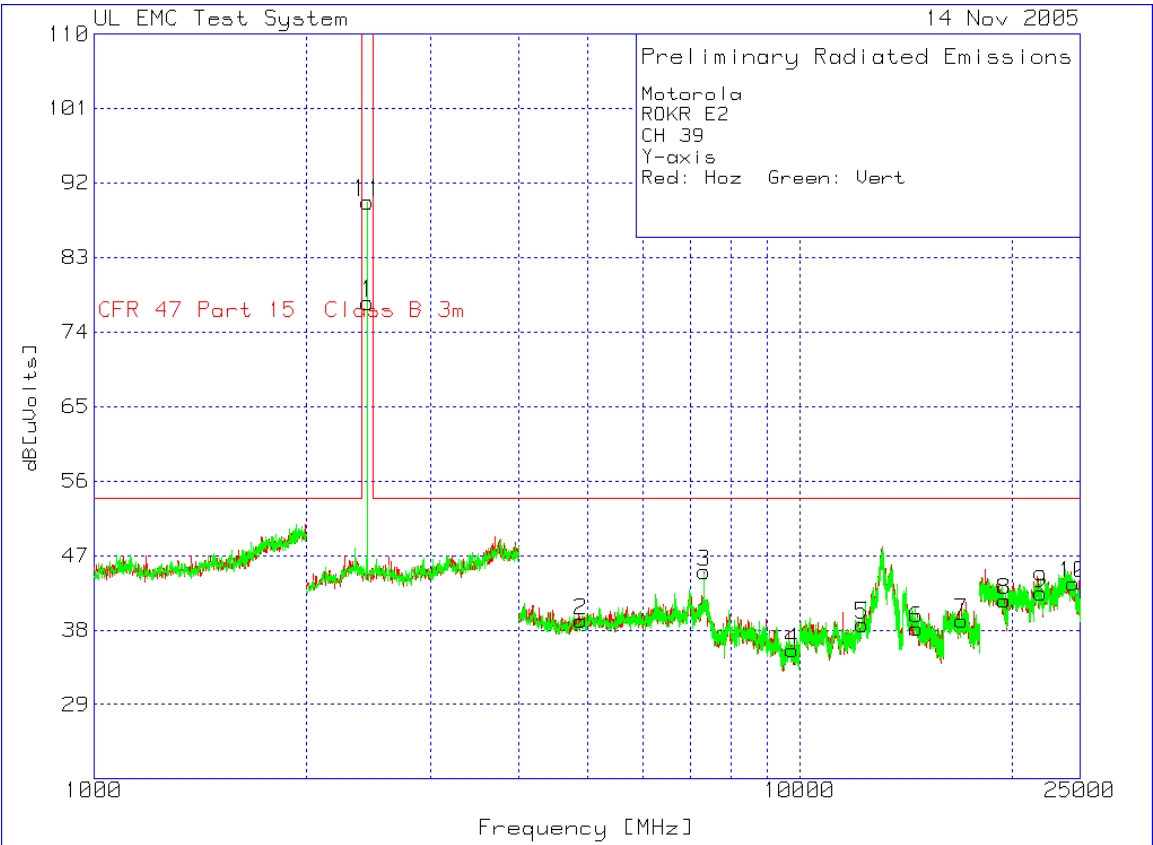
1-25 GHz Low Channel Dual Polarization Z

| Motorola<br>ROKR E2<br>CH 00<br>Z-axis<br>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] | Height [cm] | Polarity |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                                                    | 2400.802             | 55.05 pk               |               | 4.4                   | 21.8                   | 81.25            | 999     | -917.75      | 100         | Horz     |
| 4 - 8GHz 4000 - 8000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                                                    | 4924.925             | 62.83 pk               |               | -50.7                 | 27.8                   | 39.93            | 54      | -14.07       | 100         | Horz     |
| 3                                                                    | 7391.391             | 56.23 pk               |               | -46.5                 | 31.1                   | 40.83            | 54      | -13.17       | 100         | Horz     |
| 8 - 12GHz 8000 - 12000MHz                                            |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                                                    | 9973.974             | 48.12 pk               |               | -48.5                 | 36.4                   | 36.02            | 54      | -17.98       | 100         | Horz     |
| 12 - 18GHz 12000 - 18000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                                                    | 12476.318            | 44.32 pk               |               | -45                   | 39.4                   | 38.72            | 54      | -15.28       | 100         | Horz     |
| 6                                                                    | 14909.94             | 39.67 pk               |               | -41.3                 | 39.8                   | 38.17            | 54      | -15.83       | 100         | Horz     |
| 7                                                                    | 17379.586            | 39 pk                  |               | -40.5                 | 40.1                   | 38.6             | 54      | -15.4        | 100         | Horz     |
| 18-26.5GHz 18000 - 25000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                                                    | 19810.405            | 71.37 pk               |               | -69.3                 | 40.3                   | 42.37            | 54      | -11.63       | 100         | Horz     |
| 9                                                                    | 22223.112            | 60.94 pk               |               | -59.8                 | 40.5                   | 41.64            | 54      | -12.36       | 100         | Horz     |
| 10                                                                   | 24712.856            | 62.93 pk               |               | -62.1                 | 40.3                   | 41.13            | 54      | -12.87       | 100         | Horz     |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                                                   | 2400.802             | 59.49 pk               |               | 4.4                   | 21.8                   | 85.69            | 999     | -913.31      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: NONE<br>LIMIT 3: NONE |                      |                        |               |                       |                        |                  |         |              |             |          |



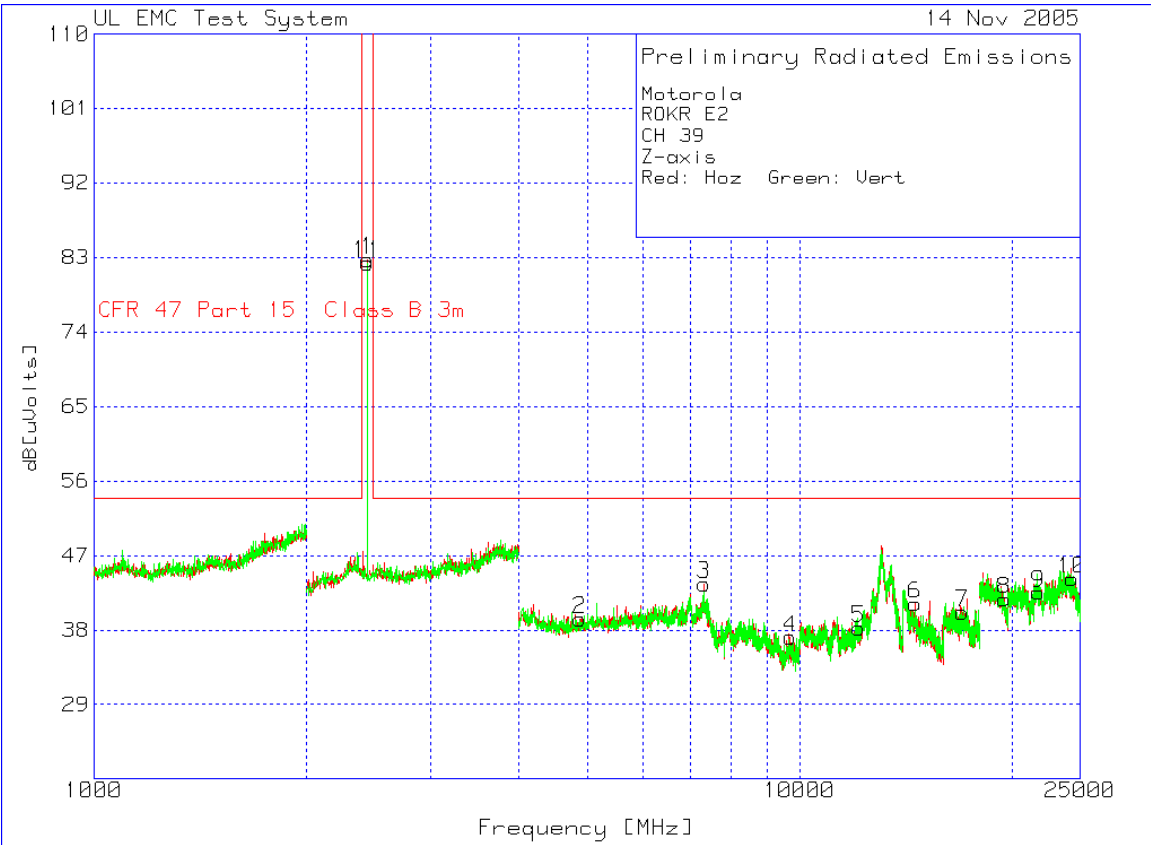
1-25 GHz Mid Channel Dual Polarization X

|                                    |           |          |          |           |            |            |         |              |             |          |  |
|------------------------------------|-----------|----------|----------|-----------|------------|------------|---------|--------------|-------------|----------|--|
| Motorola                           |           |          |          |           |            |            |         |              |             |          |  |
| ROKR E2                            |           |          |          |           |            |            |         |              |             |          |  |
| CH 39                              |           |          |          |           |            |            |         |              |             |          |  |
| X-axis                             |           |          |          |           |            |            |         |              |             |          |  |
| Red: Hoz Green: Vert               |           |          |          |           |            |            |         |              |             |          |  |
| Marker                             | Test      | Meter    | Detector | Gain/Loss | Transducer | Level      | Limit 1 | Margin 1[dB] | Height [cm] | Polarity |  |
| Number                             | Frequency | Reading  | Type     | Factor    | Factor     | dB[uVolts] |         |              |             |          |  |
|                                    | [MHz]     | [dB(uV)] |          | [dB]      | [dB]       |            |         |              |             |          |  |
| 2 - 4GHz 2000 - 4000MHz            |           |          |          |           |            |            |         |              |             |          |  |
| 1                                  | 2440.882  | 63.13    | pk       | 4.2       | 21.9       | 89.23      | 999     | -909.77      | 100         | Horz     |  |
| 4 - 8GHz 4000 - 8000MHz            |           |          |          |           |            |            |         |              |             |          |  |
| 2                                  | 4880.881  | 62.72    | pk       | -50.5     | 27.7       | 39.92      | 54      | -14.08       | 100         | Horz     |  |
| 3                                  | 7323.323  | 61.47    | pk       | -46.3     | 30.6       | 45.77      | 54      | -8.23        | 100         | Horz     |  |
| 8 - 12GHz 8000 - 12000MHz          |           |          |          |           |            |            |         |              |             |          |  |
| 4                                  | 9765.766  | 48.4     | pk       | -49.5     | 36.4       | 35.3       | 54      | -18.7        | 100         | Horz     |  |
| 12 - 18GHz 12000 - 18000MHz        |           |          |          |           |            |            |         |              |             |          |  |
| 5                                  | 12216.144 | 45.3     | pk       | -46       | 39.4       | 38.7       | 54      | -15.3        | 100         | Horz     |  |
| 6                                  | 14653.769 | 40.93    | pk       | -40.9     | 39.8       | 39.83      | 54      | -14.17       | 100         | Horz     |  |
| 7                                  | 17163.442 | 39.84    | pk       | -40.7     | 40.3       | 39.44      | 54      | -14.56       | 100         | Horz     |  |
| 18-26.5GHz 18000 - 25000MHz        |           |          |          |           |            |            |         |              |             |          |  |
| 8                                  | 19442.721 | 70.97    | pk       | -69       | 40.3       | 42.27      | 54      | -11.73       | 100         | Horz     |  |
| 9                                  | 21963.982 | 62.79    | pk       | -60.3     | 40.4       | 42.89      | 54      | -11.11       | 100         | Horz     |  |
| 10                                 | 24430.966 | 65.15    | pk       | -61.4     | 40.3       | 44.05      | 54      | -9.95        | 100         | Horz     |  |
| LIMIT 1: CFR 47 Part 15 Class B 3m |           |          |          |           |            |            |         |              |             |          |  |
| LIMIT 2: NONE                      |           |          |          |           |            |            |         |              |             |          |  |
| LIMIT 3: NONE                      |           |          |          |           |            |            |         |              |             |          |  |



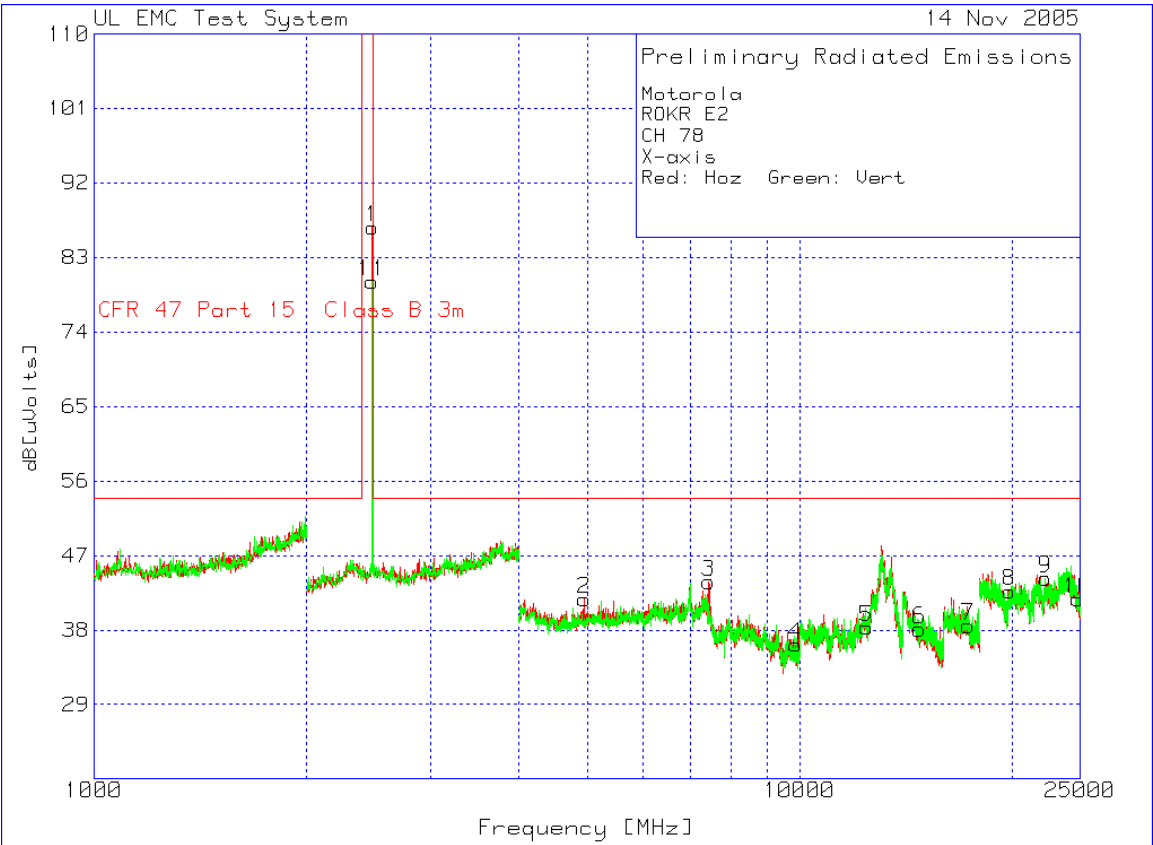
1-25 GHz Mid Channel Dual Polarization Y

| Motorola<br>ROKR E2<br>CH 39<br>Y-axis<br>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] | Height [cm] | Polarity |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                                                    | 2440.882             | 51.48 pk               |               | 4.2                   | 21.9                   | 77.58            | 999     | -921.42      | 100         | Horz     |
| 4 - 8GHz 4000 - 8000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                                                    | 4896.897             | 62.02 pk               |               | -50.6                 | 27.7                   | 39.12            | 54      | -14.88       | 100         | Horz     |
| 3                                                                    | 7323.323             | 60.74 pk               |               | -46.3                 | 30.6                   | 45.04            | 54      | -8.96        | 100         | Horz     |
| 8 - 12GHz 8000 - 12000MHz                                            |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                                                    | 9765.766             | 48.71 pk               |               | -49.5                 | 36.4                   | 35.61            | 54      | -18.39       | 100         | Horz     |
| 12 - 18GHz 12000 - 18000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                                                    | 12276.184            | 43.88 pk               |               | -44.6                 | 39.4                   | 38.68            | 54      | -15.32       | 100         | Horz     |
| 6                                                                    | 14653.769            | 39.28 pk               |               | -40.9                 | 39.8                   | 38.18            | 54      | -15.82       | 100         | Horz     |
| 7                                                                    | 16975.317            | 39.8 pk                |               | -41.1                 | 40.4                   | 39.1             | 54      | -14.9        | 100         | Horz     |
| 18-26.5GHz 18000 - 25000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                                                    | 19512.756            | 70.49 pk               |               | -69.2                 | 40.3                   | 41.59            | 54      | -12.41       | 100         | Horz     |
| 9                                                                    | 21967.484            | 62.38 pk               |               | -60.3                 | 40.4                   | 42.48            | 54      | -11.52       | 100         | Horz     |
| 10                                                                   | 24436.218            | 64.74 pk               |               | -61.4                 | 40.3                   | 43.64            | 54      | -10.36       | 100         | Horz     |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                                                   | 2440.882             | 63.62 pk               |               | 4.2                   | 21.9                   | 89.72            | 999     | -909.28      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: NONE<br>LIMIT 3: NONE |                      |                        |               |                       |                        |                  |         |              |             |          |



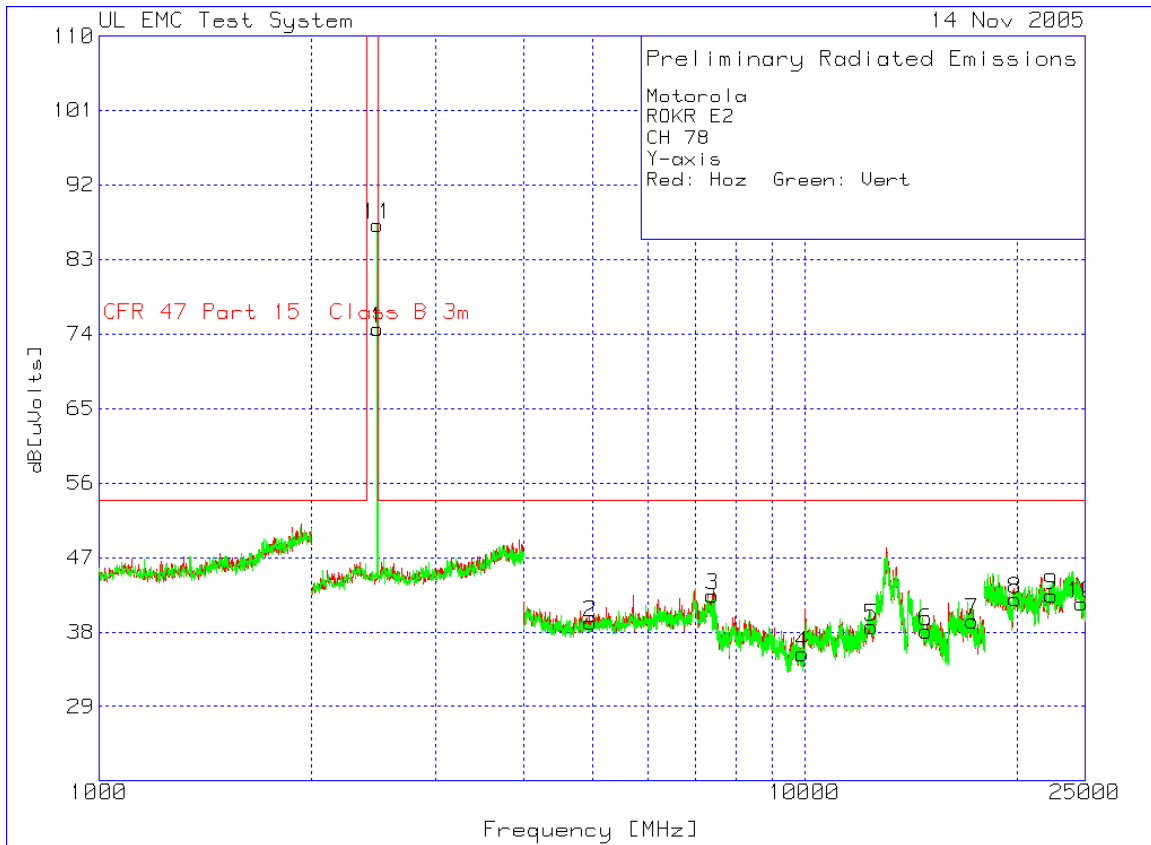
1-25 GHz Mid Channel Dual Polarization Z

|                                    |           |          |          |           |            |       |         |              |             |          |  |
|------------------------------------|-----------|----------|----------|-----------|------------|-------|---------|--------------|-------------|----------|--|
| Motorola                           |           |          |          |           |            |       |         |              |             |          |  |
| ROKR E2                            |           |          |          |           |            |       |         |              |             |          |  |
| CH 39                              |           |          |          |           |            |       |         |              |             |          |  |
| Z-axis                             |           |          |          |           |            |       |         |              |             |          |  |
| Red: Hoz Green: Vert               |           |          |          |           |            |       |         |              |             |          |  |
| Marker                             | Test      | Meter    | Detector | Gain/Loss | Transducer | Level | Limit 1 | Margin 1[dB] | Height [cm] | Polarity |  |
| Number                             | Frequency | Reading  | Type     | Factor    | Factor     |       |         |              |             |          |  |
|                                    | [MHz]     | [dB(uV)] |          | [dB]      | [dB]       |       |         |              |             |          |  |
| 2 - 4GHz 2000 - 4000MHz            |           |          |          |           |            |       |         |              |             |          |  |
| 1                                  | 2440.882  | 56.65 pk |          | 4.2       | 21.9       | 82.75 | 999     | -916.25      | 100         | Horz     |  |
| 4 - 8GHz 4000 - 8000MHz            |           |          |          |           |            |       |         |              |             |          |  |
| 2                                  | 4884.885  | 62.13 pk |          | -50.5     | 27.7       | 39.33 | 54      | -14.67       | 100         | Horz     |  |
| 3                                  | 7323.323  | 59.26 pk |          | -46.3     | 30.6       | 43.56 | 54      | -10.44       | 100         | Horz     |  |
| 8 - 12GHz 8000 - 12000MHz          |           |          |          |           |            |       |         |              |             |          |  |
| 4                                  | 9705.706  | 49.22 pk |          | -48.5     | 36.4       | 37.12 | 54      | -16.88       | 100         | Horz     |  |
| 12 - 18GHz 12000 - 18000MHz        |           |          |          |           |            |       |         |              |             |          |  |
| 5                                  | 12148.099 | 45.26 pk |          | -46.4     | 39.4       | 38.26 | 54      | -15.74       | 100         | Horz     |  |
| 6                                  | 14569.713 | 41.45 pk |          | -40.1     | 39.8       | 41.15 | 54      | -12.85       | 100         | Horz     |  |
| 7                                  | 16999.333 | 40.57 pk |          | -40.8     | 40.4       | 40.17 | 54      | -13.83       | 100         | Horz     |  |
| 18-26.5GHz 18000 - 25000MHz        |           |          |          |           |            |       |         |              |             |          |  |
| 8                                  | 19502.251 | 70.61 pk |          | -69.2     | 40.3       | 41.71 | 54      | -12.29       | 100         | Horz     |  |
| 9                                  | 21813.407 | 63.11 pk |          | -61       | 40.4       | 42.51 | 54      | -11.49       | 100         | Horz     |  |
| 10                                 | 24341.671 | 64.86 pk |          | -61       | 40.3       | 44.16 | 54      | -9.84        | 100         | Horz     |  |
| 2 - 4GHz 2000 - 4000MHz            |           |          |          |           |            |       |         |              |             |          |  |
| 11                                 | 2440.882  | 56.25 pk |          | 4.2       | 21.9       | 82.35 | 999     | -916.65      | 100         | Vert     |  |
| LIMIT 1: CFR 47 Part 15 Class B 3m |           |          |          |           |            |       |         |              |             |          |  |
| LIMIT 2: NONE                      |           |          |          |           |            |       |         |              |             |          |  |
| LIMIT 3: NONE                      |           |          |          |           |            |       |         |              |             |          |  |



1-25 GHz High Channel Dual Polarization X

| Motorola<br>ROKR E2<br>CH 78<br>X-axis<br>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] | Height [cm] | Polarity |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                                                    | 2480.962             | 60.55 pk               |               | 4.1                   | 22                     | 86.65            | 999     | -912.35      | 100         | Horz     |
| 4 - 8GHz 4000 - 8000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                                                    | 4956.957             | 64.71 pk               |               | -50.8                 | 27.8                   | 41.71            | 54      | -12.29       | 100         | Horz     |
| 3                                                                    | 7439.439             | 60.12 pk               |               | -46.9                 | 30.6                   | 43.82            | 54      | -10.18       | 100         | Horz     |
| 8 - 12GHz 8000 - 12000MHz                                            |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                                                    | 9877.878             | 49.93 pk               |               | -50.1                 | 36.4                   | 36.23            | 54      | -17.77       | 100         | Horz     |
| 12 - 18GHz 12000 - 18000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                                                    | 12456.304            | 43.99 pk               |               | -45.1                 | 39.4                   | 38.29            | 54      | -15.71       | 100         | Horz     |
| 6                                                                    | 14797.865            | 39.81 pk               |               | -41.5                 | 39.8                   | 38.11            | 54      | -15.89       | 100         | Horz     |
| 7                                                                    | 17343.562            | 39.21 pk               |               | -40.8                 | 40.1                   | 38.51            | 54      | -15.49       | 100         | Horz     |
| 18-26.5GHz 18000 - 25000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                                                    | 19841.921            | 71.49 pk               |               | -69.1                 | 40.3                   | 42.69            | 54      | -11.31       | 100         | Horz     |
| 9                                                                    | 22328.164            | 63.15 pk               |               | -59.4                 | 40.5                   | 44.25            | 54      | -9.75        | 100         | Horz     |
| 10                                                                   | 24807.404            | 63.25 pk               |               | -61.8                 | 40.3                   | 41.75            | 54      | -12.25       | 100         | Horz     |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                                                   | 2476.954             | 53.96 pk               |               | 4.1                   | 22                     | 80.06            | 999     | -918.94      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: NONE<br>LIMIT 3: NONE |                      |                        |               |                       |                        |                  |         |              |             |          |



### 1-25 GHz High Channel Dual Polarization Y

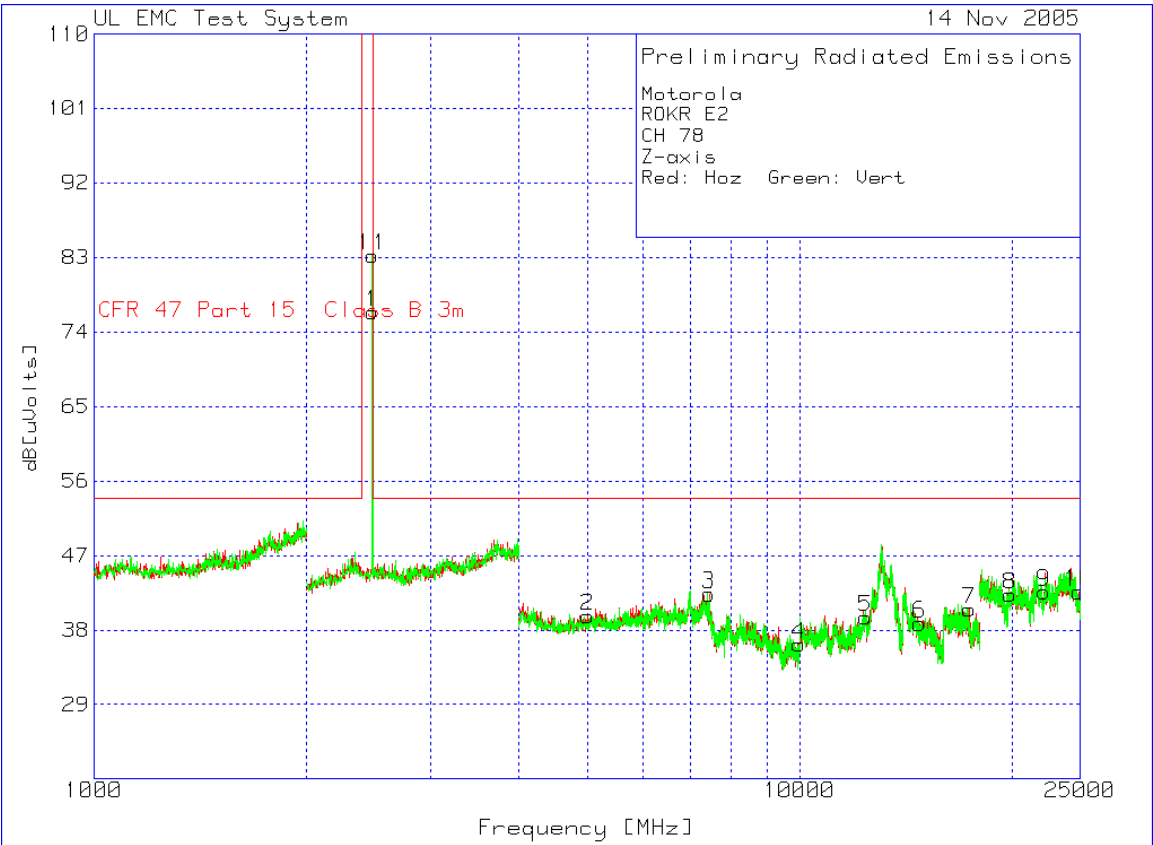
Motorola  
ROKR E2  
CH 78  
Y-axis

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] | Height [cm] | Polarity |
|------------------------------------|----------------------|------------------------|---------------|-----------------------|------------------------|------------------|---------|--------------|-------------|----------|
| <b>2 - 4GHz 2000 - 4000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                  | 2480.962             | 48.53                  | pk            | 4.1                   | 22                     | 74.63            | 999     | -924.37      | 100         | Horz     |
| <b>4 - 8GHz 4000 - 8000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                  | 4976.977             | 62.16                  | pk            | -50.8                 | 27.8                   | 39.16            | 54      | -14.84       | 100         | Horz     |
| 3                                  | 7403.403             | 57.8                   | pk            | -46.5                 | 31.1                   | 42.4             | 54      | -11.6        | 100         | Horz     |
| <b>8 - 12GHz 8000 - 12000MHz</b>   |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                  | 9929.93              | 48.3                   | pk            | -49.3                 | 36.4                   | 35.4             | 54      | -18.6        | 100         | Horz     |
| <b>12 - 18GHz 12000 - 18000MHz</b> |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                  | 12444.296            | 44.27                  | pk            | -45                   | 39.4                   | 38.67            | 54      | -15.33       | 100         | Horz     |
| 6                                  | 14861.908            | 39.32                  | pk            | -41                   | 39.8                   | 38.12            | 54      | -15.88       | 100         | Horz     |
| 7                                  | 17291.528            | 39.72                  | pk            | -40.6                 | 40.2                   | 39.32            | 54      | -14.68       | 100         | Horz     |
| <b>18-26.5GHz 18000 - 25000MHz</b> |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                  | 19890.945            | 70.86                  | pk            | -69.1                 | 40.2                   | 41.96            | 54      | -12.04       | 100         | Horz     |
| 9                                  | 22377.189            | 61.19                  | pk            | -59.3                 | 40.5                   | 42.39            | 54      | -11.61       | 100         | Horz     |
| 10                                 | 24705.853            | 63.26                  | pk            | -62.1                 | 40.3                   | 41.46            | 54      | -12.54       | 100         | Horz     |
| <b>2 - 4GHz 2000 - 4000MHz</b>     |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                 | 2480.962             | 61.11                  | pk            | 4.1                   | 22                     | 87.21            | 999     | -911.79      | 100         | Vert     |

LIMIT 1: CFR 47 Part 15 Class B 3m

LIMIT 2: NONE



1-25 GHz High Channel Dual Polarization Z

| Motorola<br>ROKR E2<br>CH 78<br>Z-axis<br>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] | Height [cm] | Polarity |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 1                                                                    | 2480.962             | 50.33 pk               |               | 4.1                   | 22                     | 76.43            | 999     | -922.57      | 100         | Horz     |
| 4 - 8GHz 4000 - 8000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 2                                                                    | 5001.001             | 62.57 pk               |               | -50.7                 | 27.8                   | 39.67            | 54      | -14.33       | 100         | Horz     |
| 3                                                                    | 7443.443             | 58.75 pk               |               | -46.9                 | 30.5                   | 42.35            | 54      | -11.65       | 100         | Horz     |
| 8 - 12GHz 8000 - 12000MHz                                            |                      |                        |               |                       |                        |                  |         |              |             |          |
| 4                                                                    | 9981.982             | 48.26 pk               |               | -48.4                 | 36.4                   | 36.26            | 54      | -17.74       | 100         | Horz     |
| 12 - 18GHz 12000 - 18000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 5                                                                    | 12392.262            | 44.12 pk               |               | -44                   | 39.4                   | 39.52            | 54      | -14.48       | 100         | Horz     |
| 6                                                                    | 14789.86             | 40.4 pk                |               | -41.4                 | 39.8                   | 38.8             | 54      | -15.2        | 100         | Horz     |
| 7                                                                    | 17387.592            | 40.82 pk               |               | -40.4                 | 40.1                   | 40.52            | 54      | -13.48       | 100         | Horz     |
| 18-26.5GHz 18000 - 25000MHz                                          |                      |                        |               |                       |                        |                  |         |              |             |          |
| 8                                                                    | 19876.938            | 71.17 pk               |               | -69.1                 | 40.2                   | 42.27            | 54      | -11.73       | 100         | Horz     |
| 9                                                                    | 22205.603            | 62.04 pk               |               | -59.9                 | 40.5                   | 42.64            | 54      | -11.36       | 100         | Horz     |
| 10                                                                   | 24873.937            | 63.81 pk               |               | -61.5                 | 40.3                   | 42.61            | 54      | -11.39       | 100         | Horz     |
| 2 - 4GHz 2000 - 4000MHz                                              |                      |                        |               |                       |                        |                  |         |              |             |          |
| 11                                                                   | 2480.962             | 57.13 pk               |               | 4.1                   | 22                     | 83.23            | 999     | -915.77      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: NONE<br>LIMIT 3: NONE |                      |                        |               |                       |                        |                  |         |              |             |          |



Authorized Band Emissions Low Channel Dual Polarization X

| Motorola<br>ROKR E2<br>CH 00<br>X-axis<br>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             | 62.88 pk               |               | 4.4                   | 21.8                   | 89.08            | 999     | -909.92      | 999     | -909.92      | 100         | Horz     |  |
| 2                                                              | 2400.08              | 22.74 pk               |               | 4.4                   | 21.8                   | 48.94            | 999     | -950.06      | 999     | -950.06      | 100         | Horz     |  |
| 3                                                              | 2380.521             | 19.25 pk               |               | 4.4                   | 21.8                   | 45.45            | 54      | -8.55        | 54      | -8.55        | 100         | Horz     |  |
| 2 - 4GHz 2360 - 2520MHz                                        |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |  |
| 4                                                              | 2402.004             | 56.07 pk               |               | 4.4                   | 21.8                   | 82.27            | 999     | -916.73      | 999     | -916.73      | 100         | Vert     |  |
| 5                                                              | 2395.271             | 18.77 pk               |               | 4.4                   | 21.8                   | 44.97            | 54      | -9.03        | 999     | -954.03      | 100         | Vert     |  |
| 6                                                              | 2369.94              | 19.79 pk               |               | 4.4                   | 21.8                   | 45.99            | 54      | -8.01        | 54      | -8.01        | 100         | Vert     |  |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |  |



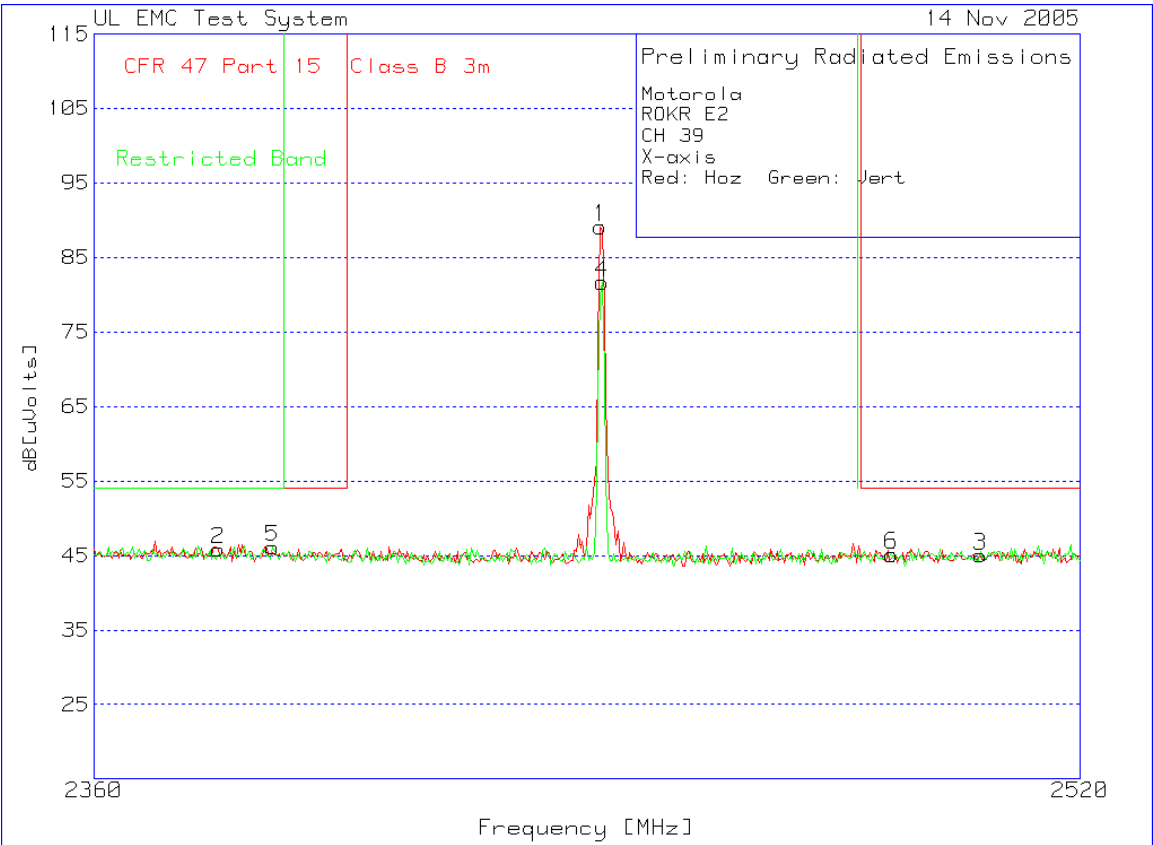
Authorized Band Emissions Low Channel Dual Polarization Y

| Motorola<br>ROKR E2<br>CH 00<br>Y-axis<br>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             | 52.69 pk               |               | 4.4                   | 21.8                   | 78.89            | 999     | -920.11      | 999     | -920.11      | 100         | Horz     |
| 2                                                              | 2400.721             | 18.75 pk               |               | 4.4                   | 21.8                   | 44.95            | 999     | -954.05      | 999     | -954.05      | 100         | Horz     |
| 3                                                              | 2388.858             | 20.04 pk               |               | 4.4                   | 21.8                   | 46.24            | 54      | -7.76        | 54      | -7.76        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz                                        |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |
| 4                                                              | 2402.004             | 64.71 pk               |               | 4.4                   | 21.8                   | 90.91            | 999     | -908.09      | 999     | -908.09      | 100         | Vert     |
| 5                                                              | 2400.08              | 24.79 pk               |               | 4.4                   | 21.8                   | 50.99            | 999     | -948.01      | 999     | -948.01      | 100         | Vert     |
| 6                                                              | 2398.798             | 23.16 pk               |               | 4.4                   | 21.8                   | 49.36            | 54      | -4.64        | 999     | -949.64      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |



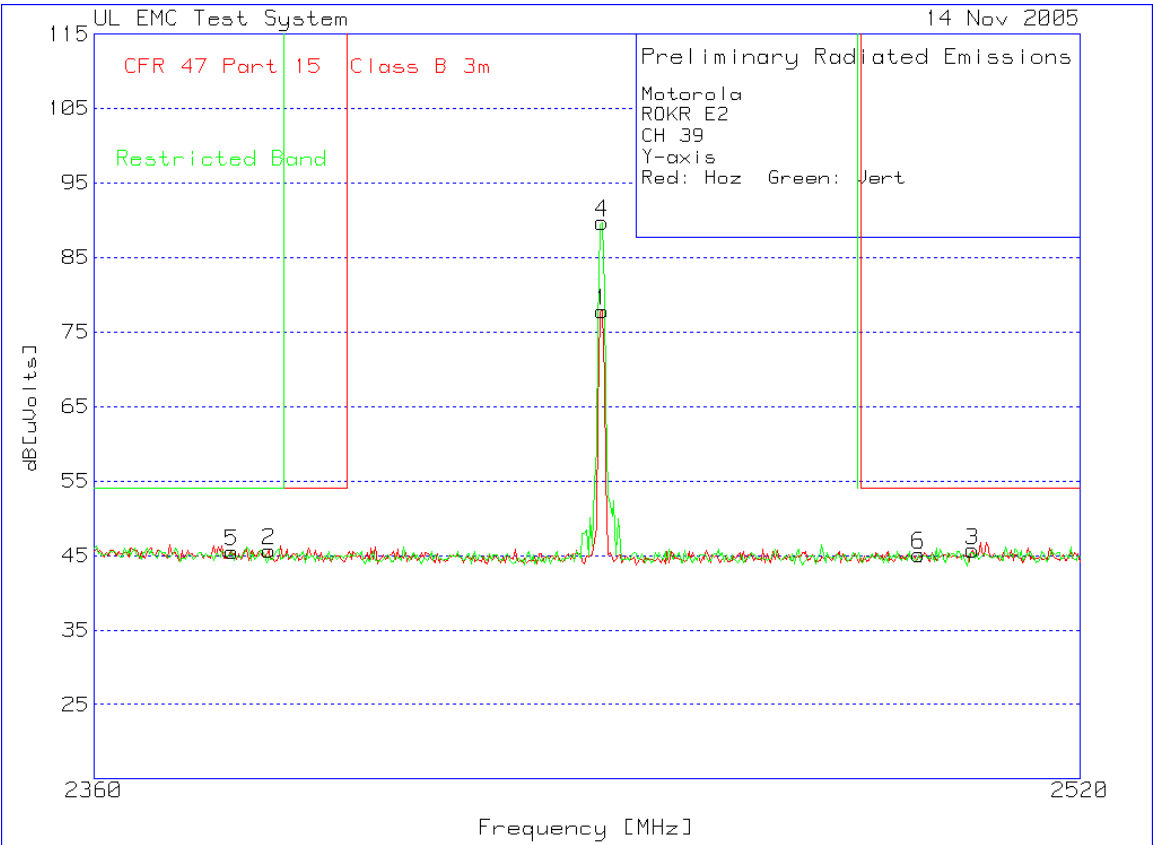
Authorized Band Emissions Low Channel Dual Polarization Z

| Motorola<br>ROKR E2<br>CH 00<br>Z-axis<br>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                                                                               | 2401.683             | 57.45                  | pk            | 4.4                   | 21.8                   | 83.65            | 999     | -915.35      | 999     | -915.35      | 100         | Horz     |
| 2                                                                               | 2400.08              | 18.66                  | pk            | 4.4                   | 21.8                   | 44.86            | 999     | -954.14      | 999     | -954.14      | 100         | Horz     |
| 3                                                                               | 2388.537             | 19.35                  | pk            | 4.4                   | 21.8                   | 45.55            | 54      | -8.45        | 54      | -8.45        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz                                                         |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |
| 4                                                                               | 2402.004             | 59.21                  | pk            | 4.4                   | 21.8                   | 85.41            | 999     | -913.59      | 999     | -913.59      | 100         | Vert     |
| 5                                                                               | 2400.08              | 24.43                  | pk            | 4.4                   | 21.8                   | 50.63            | 999     | -948.37      | 999     | -948.37      | 100         | Vert     |
| 6                                                                               | 2395.271             | 18.17                  | pk            | 4.4                   | 21.8                   | 44.37            | 54      | -9.63        | 999     | -954.63      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band<br>LIMIT 3: NONE |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |



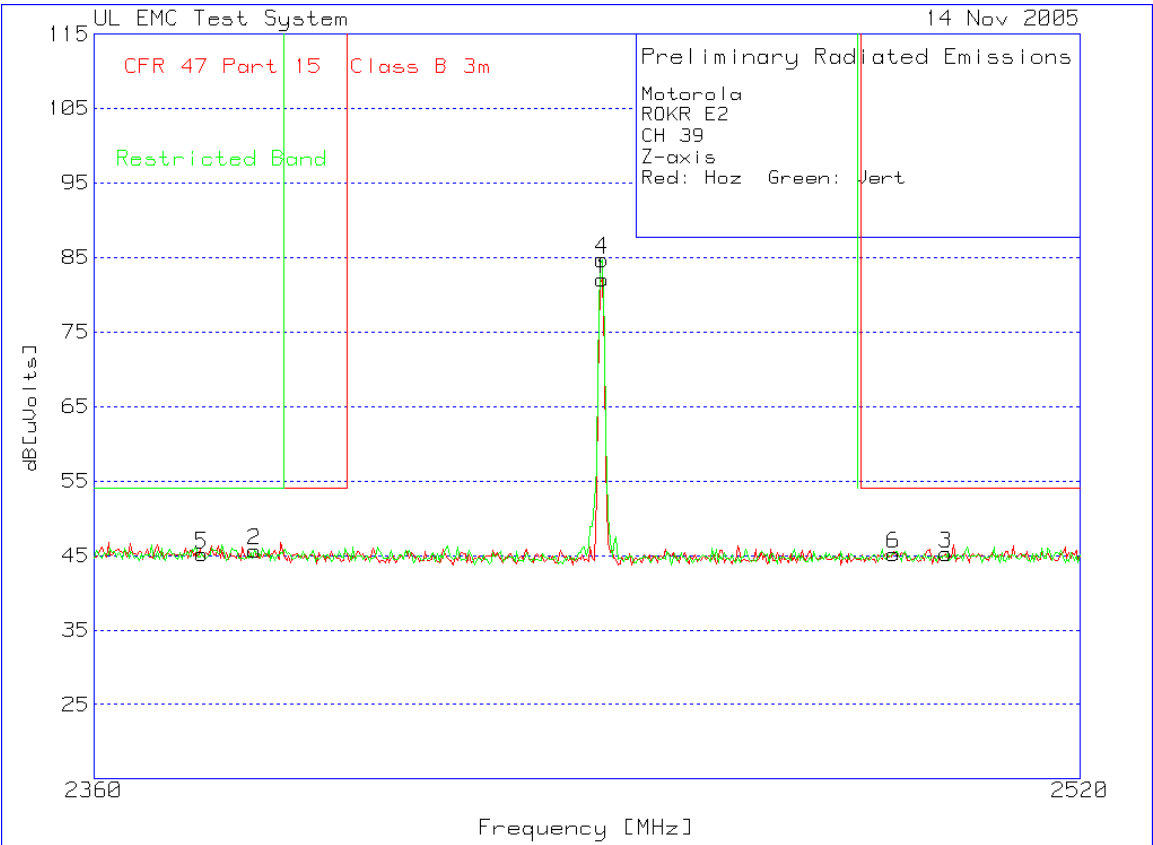
Authorized Band Emissions Mid Channel Dual Polarization X

| Motorola<br>ROKR E2<br>CH 39<br>X-axis<br>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                                                              | 2440.802             | 63.04                  | pk            | 4.2                   | 21.9                   | 89.14            | 999     | -909.86      | 999     | -909.86      | 100         | Horz     |
| 2                                                              | 2379.559             | 19.65                  | pk            | 4.4                   | 21.8                   | 45.85            | 54      | -8.15        | 54      | -8.15        | 100         | Horz     |
| 3                                                              | 2503.327             | 18.81                  | pk            | 4.1                   | 22.1                   | 45.01            | 54      | -8.99        | 0       | 45.01        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz                                        |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |
| 4                                                              | 2441.122             | 55.56                  | pk            | 4.2                   | 21.9                   | 81.66            | 999     | -917.34      | 999     | -917.34      | 100         | Vert     |
| 5                                                              | 2388.216             | 19.93                  | pk            | 4.4                   | 21.8                   | 46.13            | 54      | -7.87        | 54      | -7.87        | 100         | Vert     |
| 6                                                              | 2488.577             | 18.93                  | pk            | 4.1                   | 22.1                   | 45.13            | 54      | -8.87        | 0       | 45.13        | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |



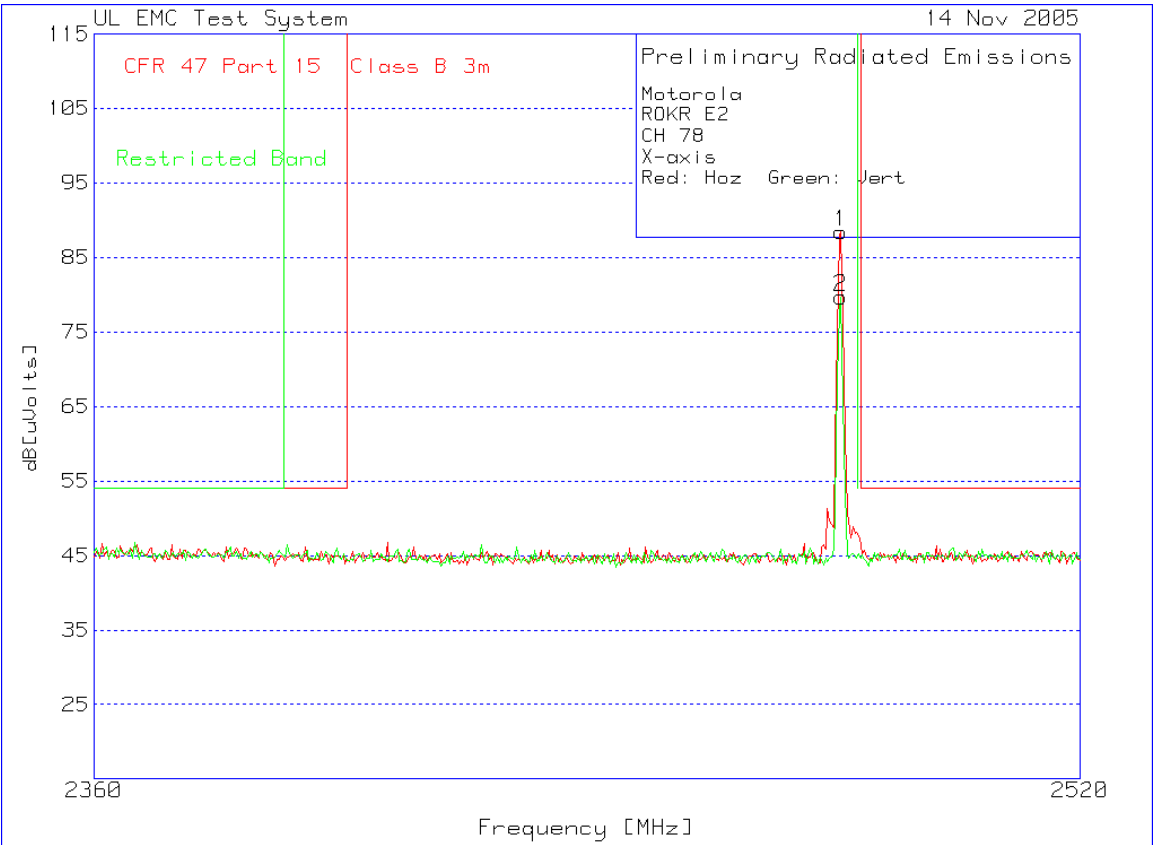
Authorized Band Emissions Mid Channel Dual Polarization Y

| Motorola<br>ROKR E2<br>CH 39<br>Y-axis<br>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             | 51.69                  | pk            |                       | 4.2                    | 21.9             | 77.79   | 999          | -921.21 | 999          | -921.21     | 100      | Horz |
| 2                                                              | 2387.575             | 19.45                  | pk            |                       | 4.4                    | 21.8             | 45.65   | 54           | -8.35   | 54           | -8.35       | 100      | Horz |
| 3                                                              | 2502.044             | 19.51                  | pk            |                       | 4.1                    | 22.1             | 45.71   | 54           | -8.29   | 0            | 45.71       | 100      | Horz |
| 2 - 4GHz 2360 - 2520MHz                                        |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |      |
| 4                                                              | 2441.122             | 63.64                  | pk            |                       | 4.2                    | 21.9             | 89.74   | 999          | -909.26 | 999          | -909.26     | 100      | Vert |
| 5                                                              | 2381.804             | 19.33                  | pk            |                       | 4.4                    | 21.8             | 45.53   | 54           | -8.47   | 54           | -8.47       | 100      | Vert |
| 6                                                              | 2493.066             | 18.95                  | pk            |                       | 4.1                    | 22.1             | 45.15   | 54           | -8.85   | 0            | 45.15       | 100      | Vert |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |      |



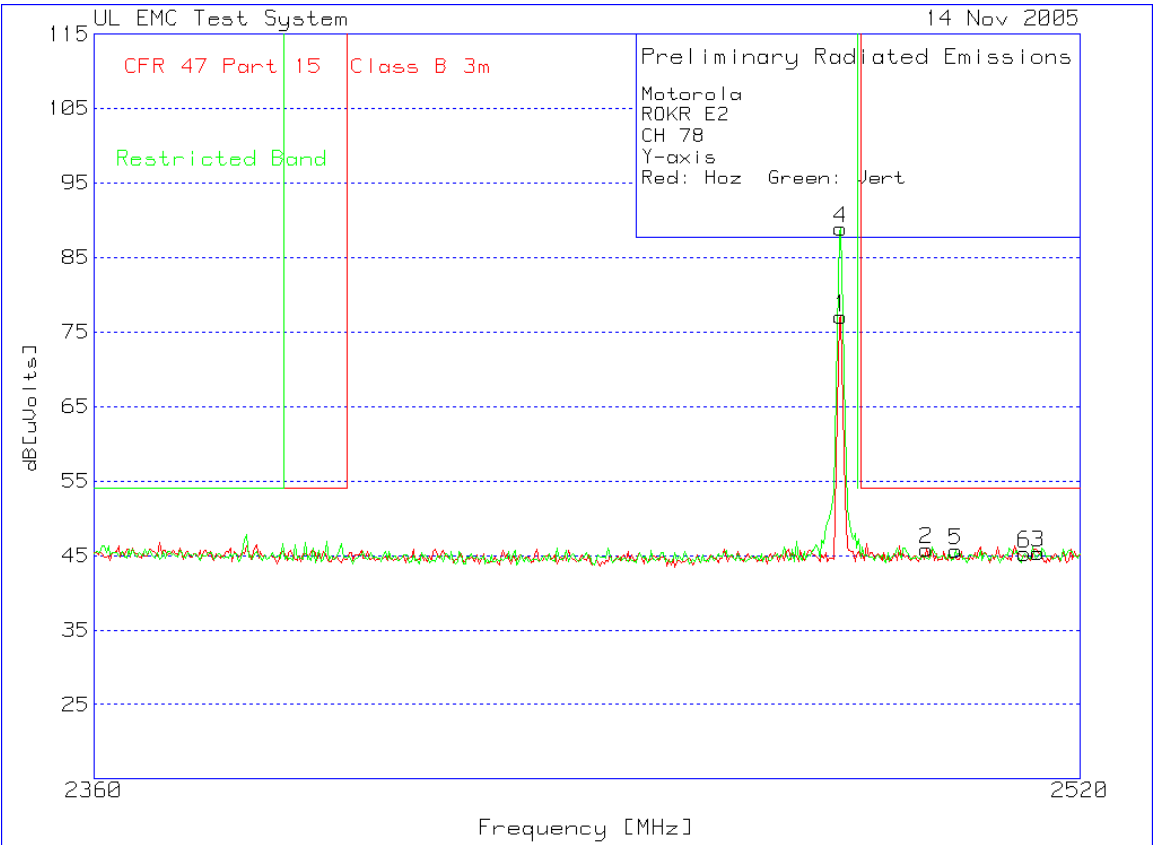
Authorized Band Emissions Mid Channel Dual Polarization Z

|                                    |           |          |          |           |            |            |         |              |         |              |             |          |
|------------------------------------|-----------|----------|----------|-----------|------------|------------|---------|--------------|---------|--------------|-------------|----------|
| Motorola                           |           |          |          |           |            |            |         |              |         |              |             |          |
| ROKR E2                            |           |          |          |           |            |            |         |              |         |              |             |          |
| CH 39                              |           |          |          |           |            |            |         |              |         |              |             |          |
| Z-axis                             |           |          |          |           |            |            |         |              |         |              |             |          |
| 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                                  | 2441.122  | 55.99    | pk       | 4.2       | 21.9       | 82.09      | 999     | -916.91      | 999     | -916.91      | 100         | Horz     |
| 2                                  | 2385.331  | 19.43    | pk       | 4.4       | 21.8       | 45.63      | 54      | -8.37        | 54      | -8.37        | 100         | Horz     |
| 3                                  | 2497.555  | 19.06    | pk       | 4.1       | 22.1       | 45.26      | 54      | -8.74        | 0       | 45.26        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz            |           |          |          |           |            |            |         |              |         |              |             |          |
| 4                                  | 2441.122  | 58.61    | pk       | 4.2       | 21.9       | 84.71      | 999     | -914.29      | 999     | -914.29      | 100         | Vert     |
| 5                                  | 2376.994  | 18.97    | pk       | 4.4       | 21.8       | 45.17      | 54      | -8.83        | 54      | -8.83        | 100         | Vert     |
| 6                                  | 2488.898  | 19.03    | pk       | 4.1       | 22.1       | 45.23      | 54      | -8.77        | 0       | 45.23        | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m |           |          |          |           |            |            |         |              |         |              |             |          |
| LIMIT 2: Restricted Band           |           |          |          |           |            |            |         |              |         |              |             |          |
| LIMIT 3: NONE                      |           |          |          |           |            |            |         |              |         |              |             |          |



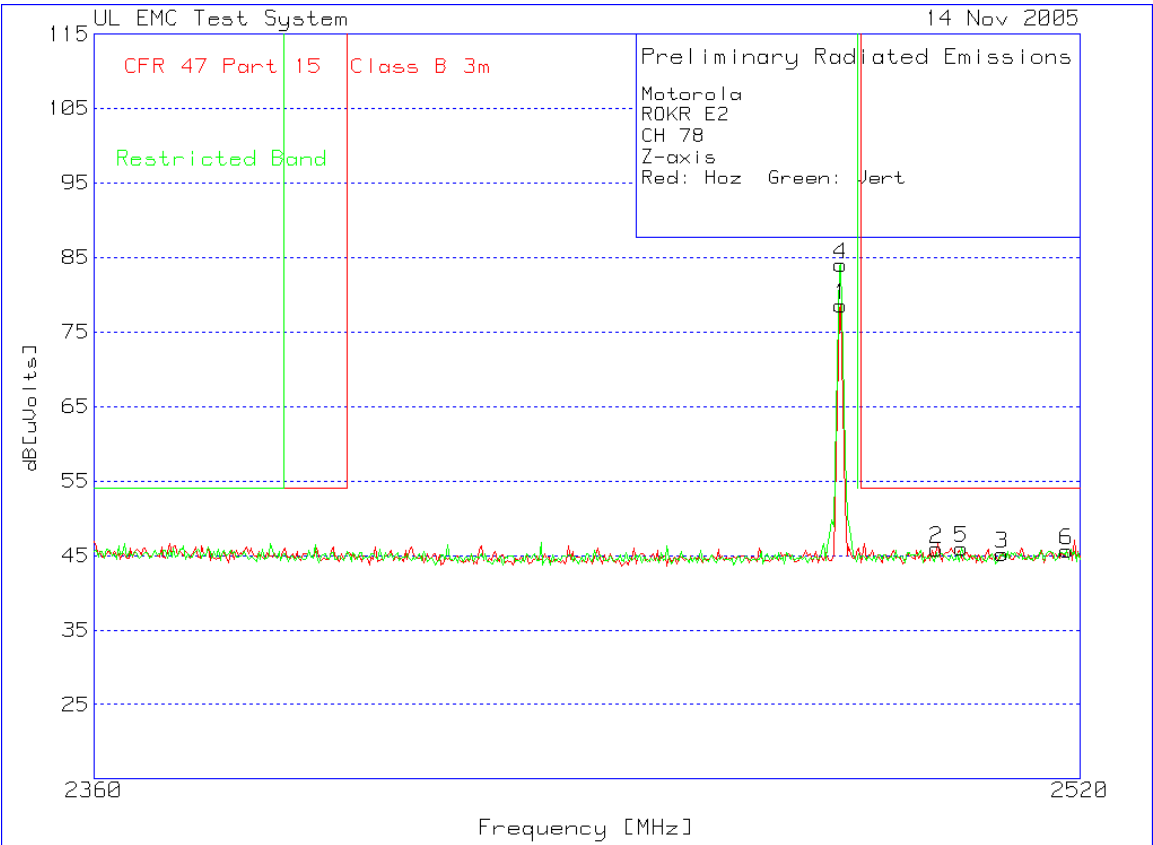
Authorized Band Emissions High Channel Dual Polarization X

|                                    |           |          |          |           |            |            |         |              |         |              |             |          |
|------------------------------------|-----------|----------|----------|-----------|------------|------------|---------|--------------|---------|--------------|-------------|----------|
| Motorola                           |           |          |          |           |            |            |         |              |         |              |             |          |
| ROKR E2                            |           |          |          |           |            |            |         |              |         |              |             |          |
| CH 78                              |           |          |          |           |            |            |         |              |         |              |             |          |
| X-axis                             |           |          |          |           |            |            |         |              |         |              |             |          |
| 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                                  | 2480.24   | 62.3 pk  |          | 4.1       | 22         | 88.4       | 999     | -910.6       | 999     | -910.6       | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz            |           |          |          |           |            |            |         |              |         |              |             |          |
| 2                                  | 2480.24   | 53.64 pk |          | 4.1       | 22         | 79.74      | 999     | -919.26      | 999     | -919.26      | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m |           |          |          |           |            |            |         |              |         |              |             |          |
| LIMIT 2: Restricted Band           |           |          |          |           |            |            |         |              |         |              |             |          |



Authorized Band Emissions High Channel Dual Polarization Y

|                                    |           |          |          |           |            |            |         |              |         |              |             |          |
|------------------------------------|-----------|----------|----------|-----------|------------|------------|---------|--------------|---------|--------------|-------------|----------|
| Motorola                           |           |          |          |           |            |            |         |              |         |              |             |          |
| ROKR E2                            |           |          |          |           |            |            |         |              |         |              |             |          |
| CH 78                              |           |          |          |           |            |            |         |              |         |              |             |          |
| Y-axis                             |           |          |          |           |            |            |         |              |         |              |             |          |
| 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                                  | 2480.24   | 50.92 pk |          | 4.1       | 22         | 77.02      | 999     | -921.98      | 999     | -921.98      | 100         | Horz     |
| 2                                  | 2494.349  | 19.62 pk |          | 4.1       | 22.1       | 45.82      | 54      | -8.18        | 0       | 45.82        | 100         | Horz     |
| 3                                  | 2512.946  | 19.15 pk |          | 4.1       | 22.1       | 45.35      | 54      | -8.65        | 0       | 45.35        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz            |           |          |          |           |            |            |         |              |         |              |             |          |
| 4                                  | 2480.24   | 62.76 pk |          | 4.1       | 22         | 88.86      | 999     | -910.14      | 999     | -910.14      | 100         | Vert     |
| 5                                  | 2499.158  | 19.49 pk |          | 4.1       | 22.1       | 45.69      | 54      | -8.31        | 0       | 45.69        | 100         | Vert     |
| 6                                  | 2510.701  | 19.11 pk |          | 4.1       | 22.1       | 45.31      | 54      | -8.69        | 0       | 45.31        | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m |           |          |          |           |            |            |         |              |         |              |             |          |
| LIMIT 2: Restricted Band           |           |          |          |           |            |            |         |              |         |              |             |          |



Authorized Band Emissions High Channel Dual Polarization Z

| Motorola<br>ROKR E2<br>CH 78<br>Z-axis<br>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                                                              | 2480.24              | 52.49 pk               |               | 4.1                   | 22                     | 78.59            | 999     | -920.41      | 999     | -920.41      | 100         | Horz     |
| 2                                                              | 2495.952             | 19.71 pk               |               | 4.1                   | 22.1                   | 45.91            | 54      | -8.09        | 0       | 45.91        | 100         | Horz     |
| 3                                                              | 2506.854             | 19.02 pk               |               | 4.1                   | 22.1                   | 45.22            | 54      | -8.78        | 0       | 45.22        | 100         | Horz     |
| 2 - 4GHz 2360 - 2520MHz                                        |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |
| 4                                                              | 2480.24              | 57.96 pk               |               | 4.1                   | 22                     | 84.06            | 999     | -914.94      | 999     | -914.94      | 100         | Vert     |
| 5                                                              | 2500.12              | 19.8 pk                |               | 4.1                   | 22.1                   | 46               | 54      | -8           | 0       | 46           | 100         | Vert     |
| 6                                                              | 2517.756             | 19.46 pk               |               | 4.1                   | 22.1                   | 45.66            | 54      | -8.34        | 0       | 45.66        | 100         | Vert     |
| LIMIT 1: CFR 47 Part 15 Class B 3m<br>LIMIT 2: Restricted Band |                      |                        |               |                       |                        |                  |         |              |         |              |             |          |

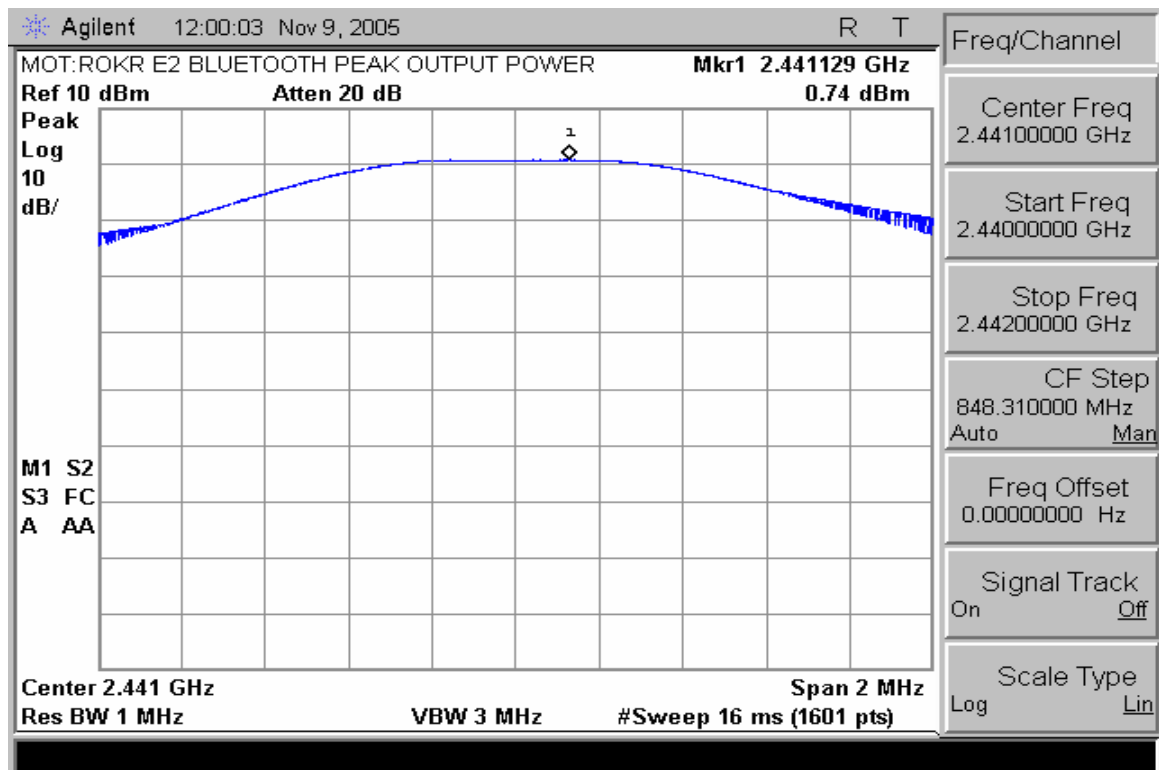
## PEAK OUTPUT POWER

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**

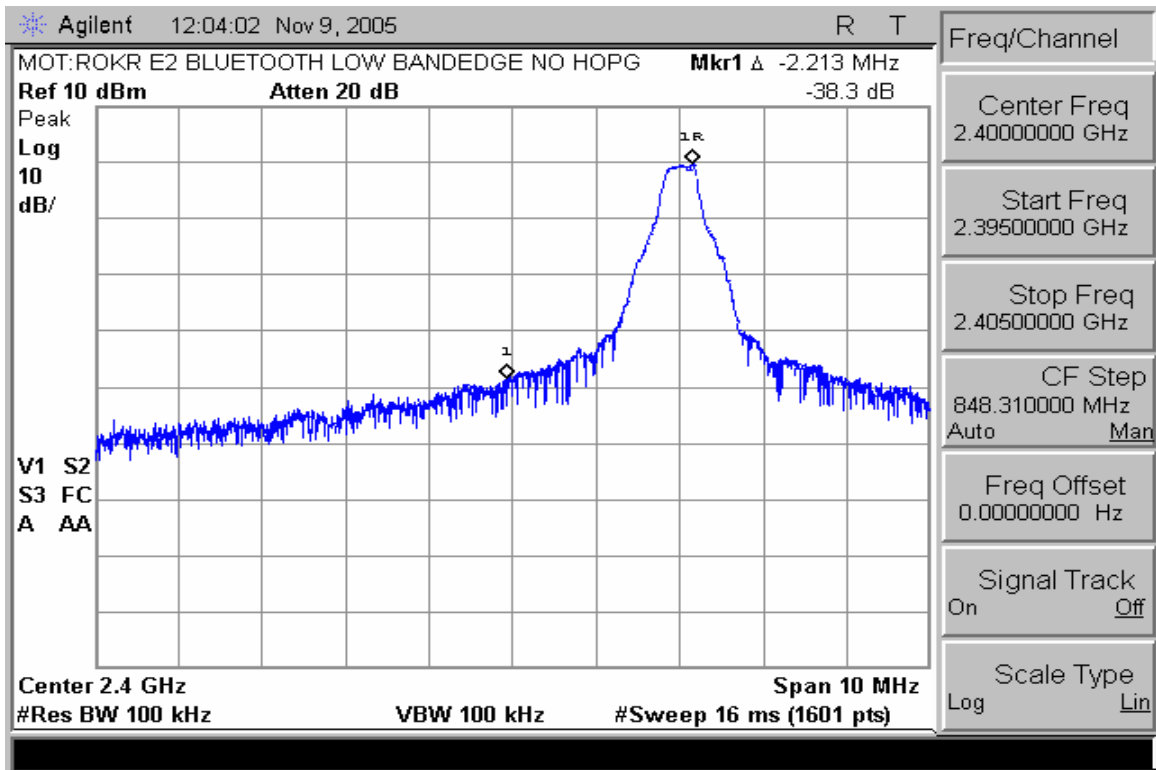
CFR 47 Part 15.247

### **Measurement Procedure**

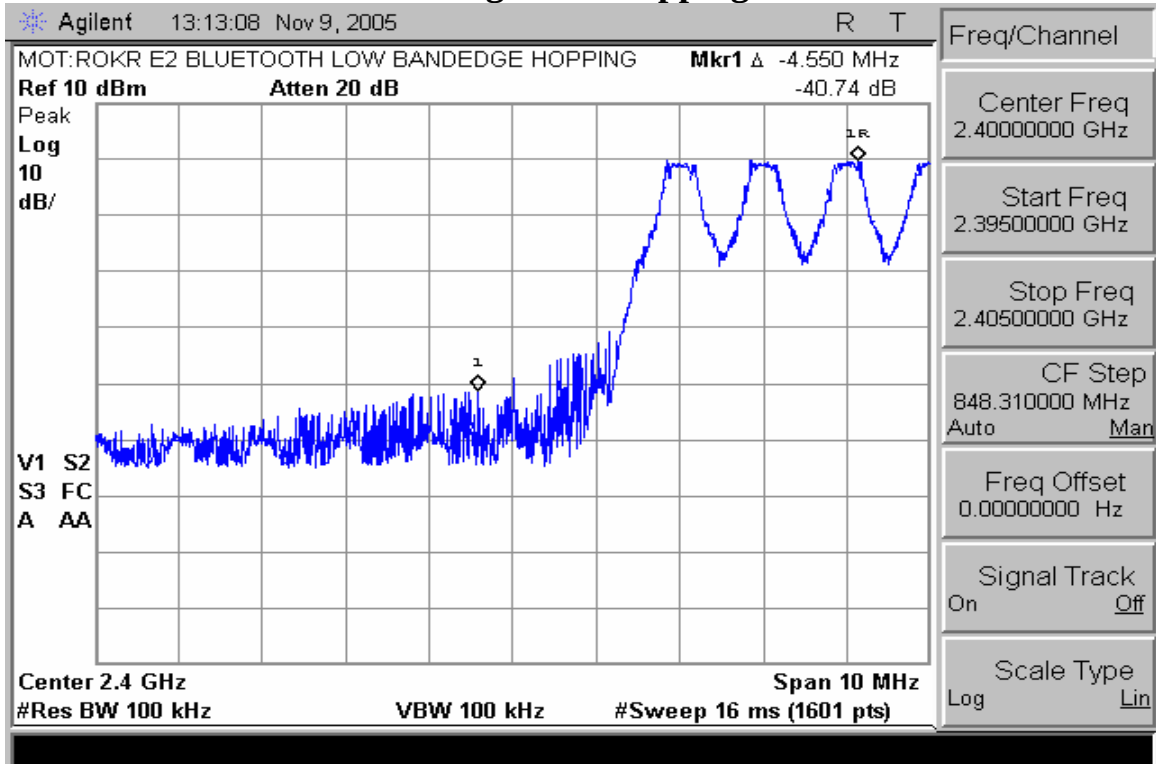
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

### **Measurement Results**

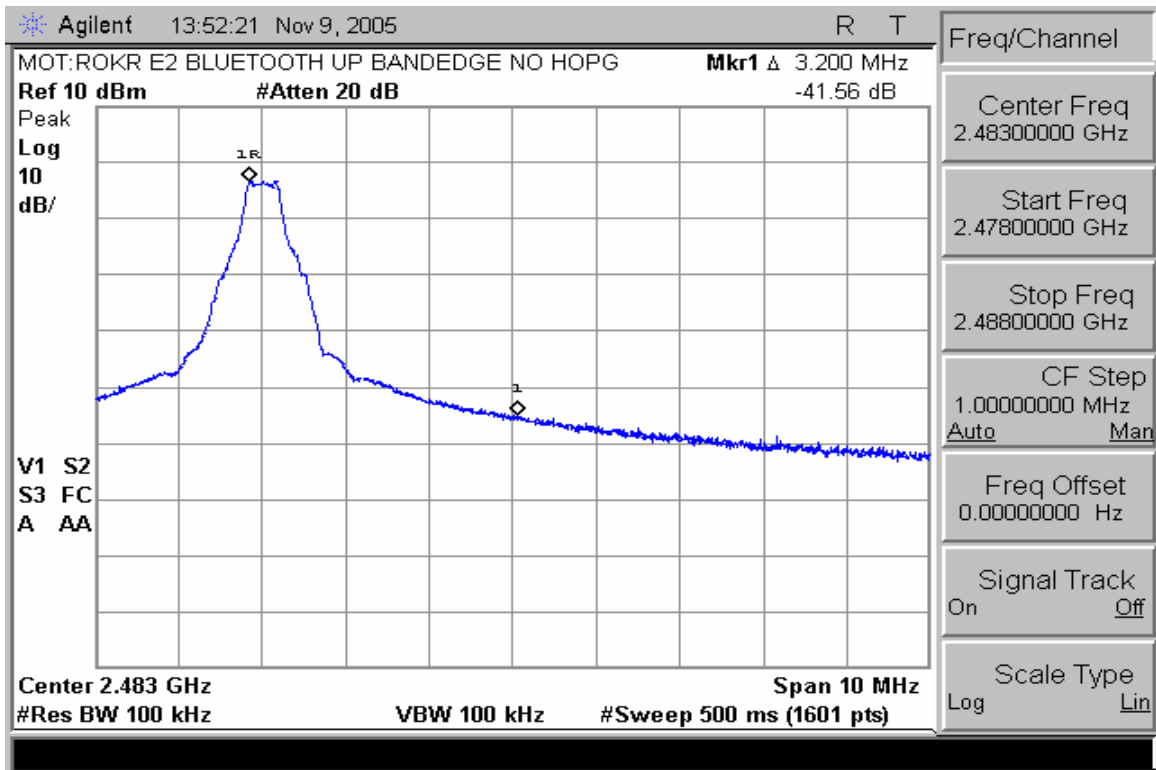
See Attached:



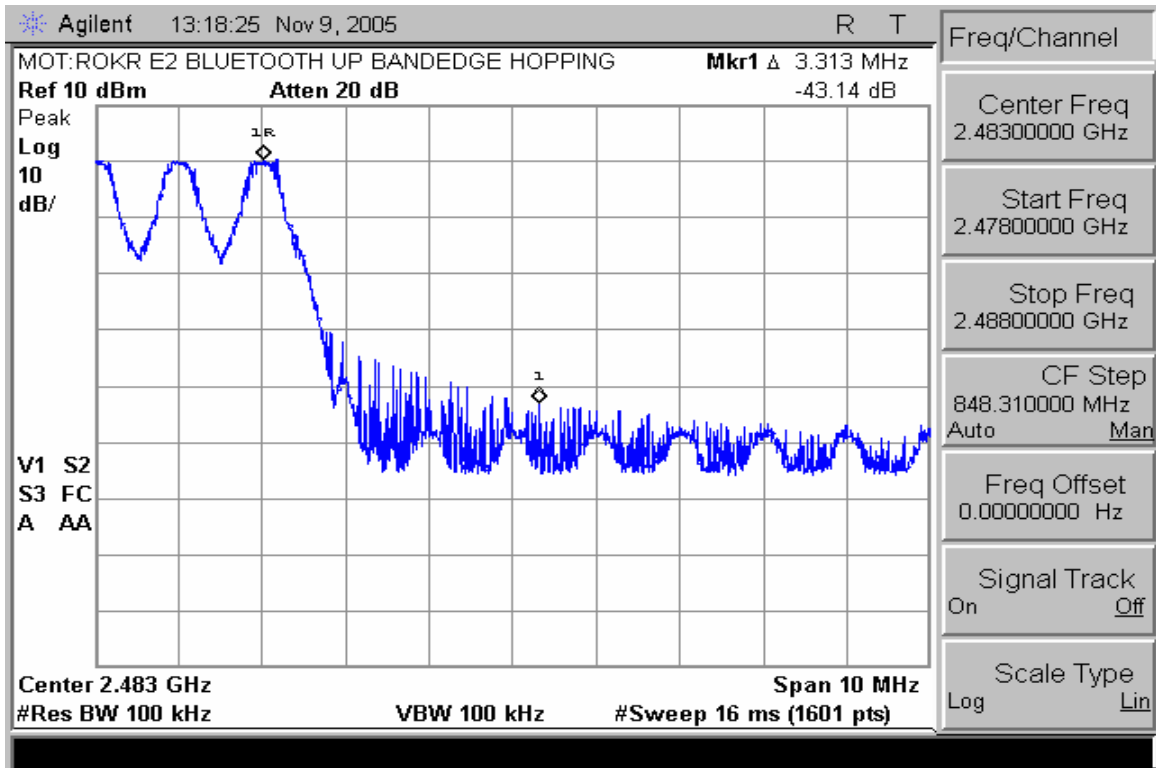
### Low Band Edge with Hopping Disabled



### Low Band Edge with Hopping Enabled



High Band Edge with Hopping Disabled



High Band Edge with Hopping Enabled

## **SPURIOUS RF CONDUCTED EMISSIONS**

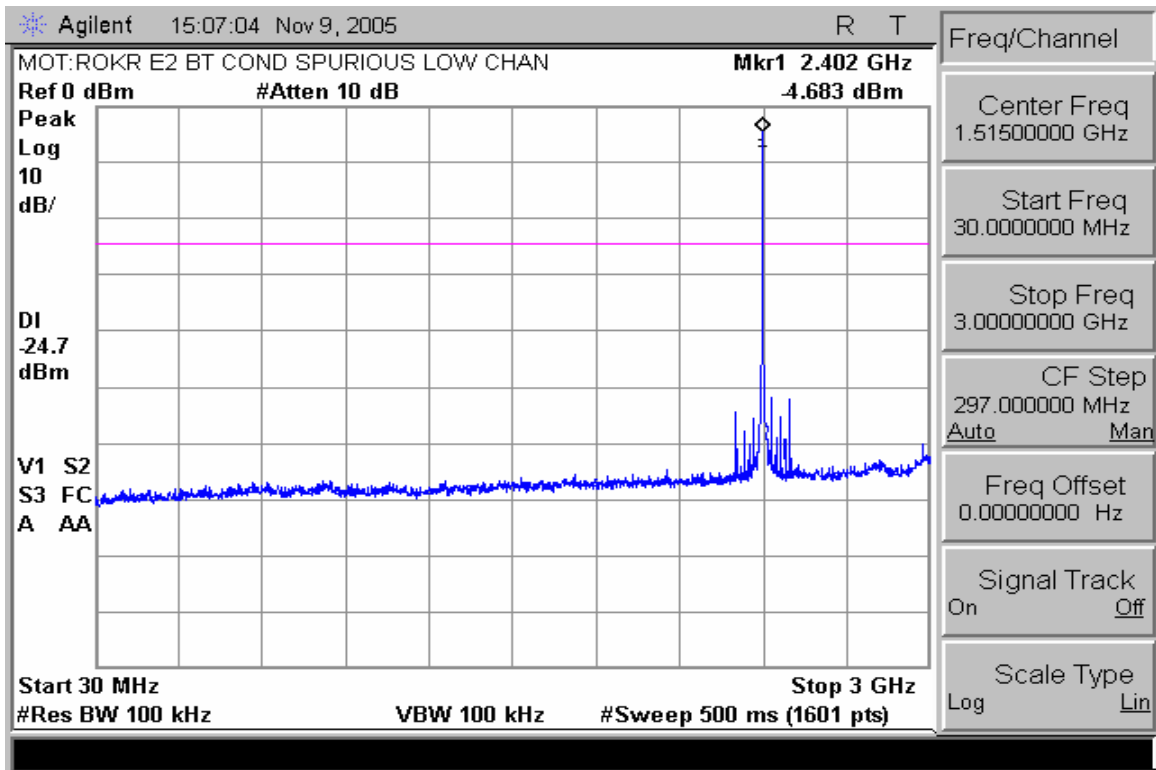
CFR 47 Part 15.247

### **Measurement Procedure**

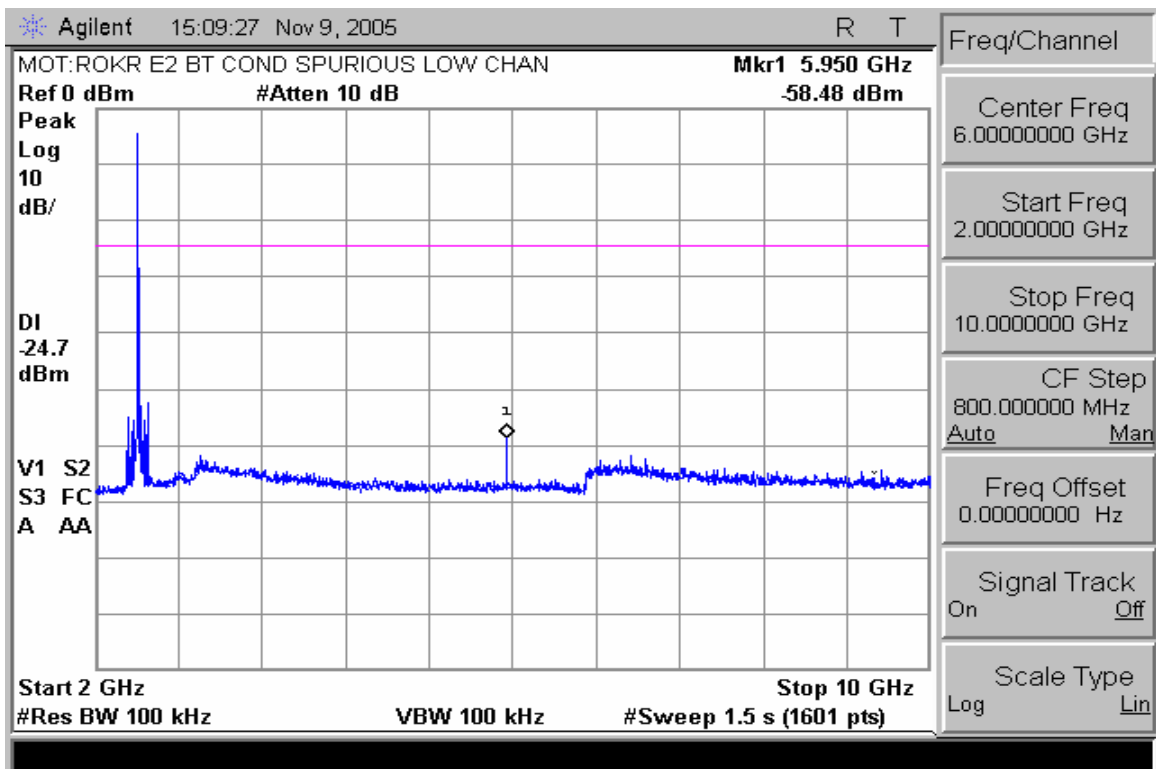
The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

### **Measurement Results**

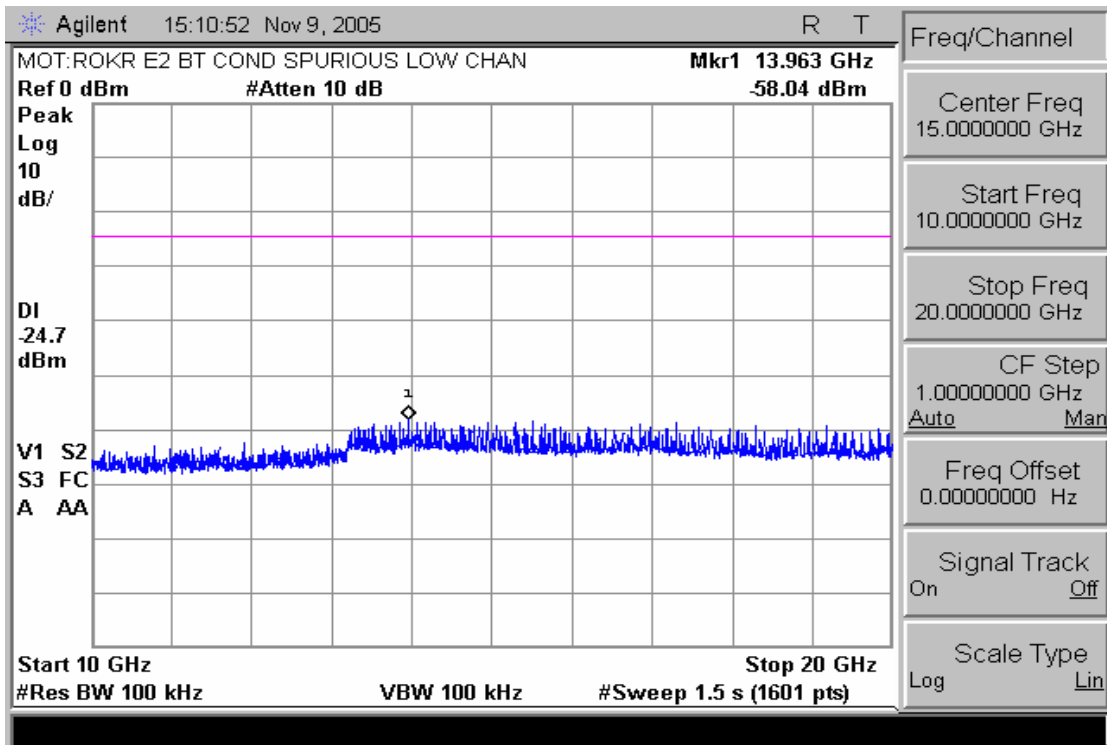
See attached:



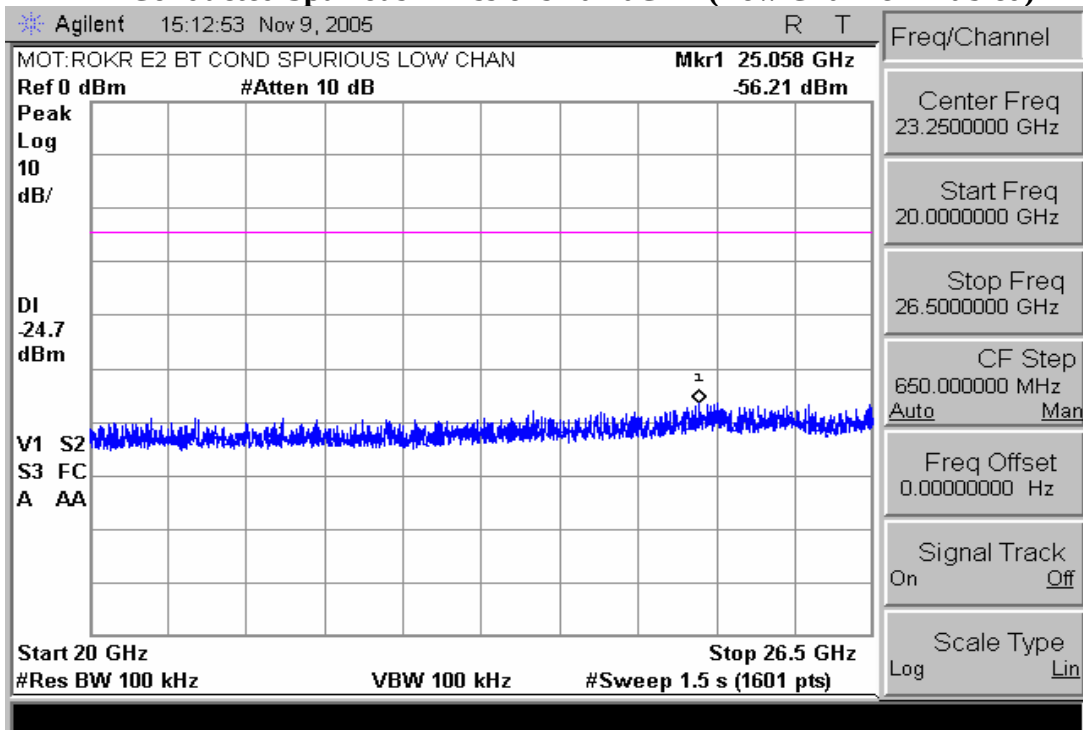
**Conducted Spurious Emissions 30-3000MHz (Low Channel Enabled)**



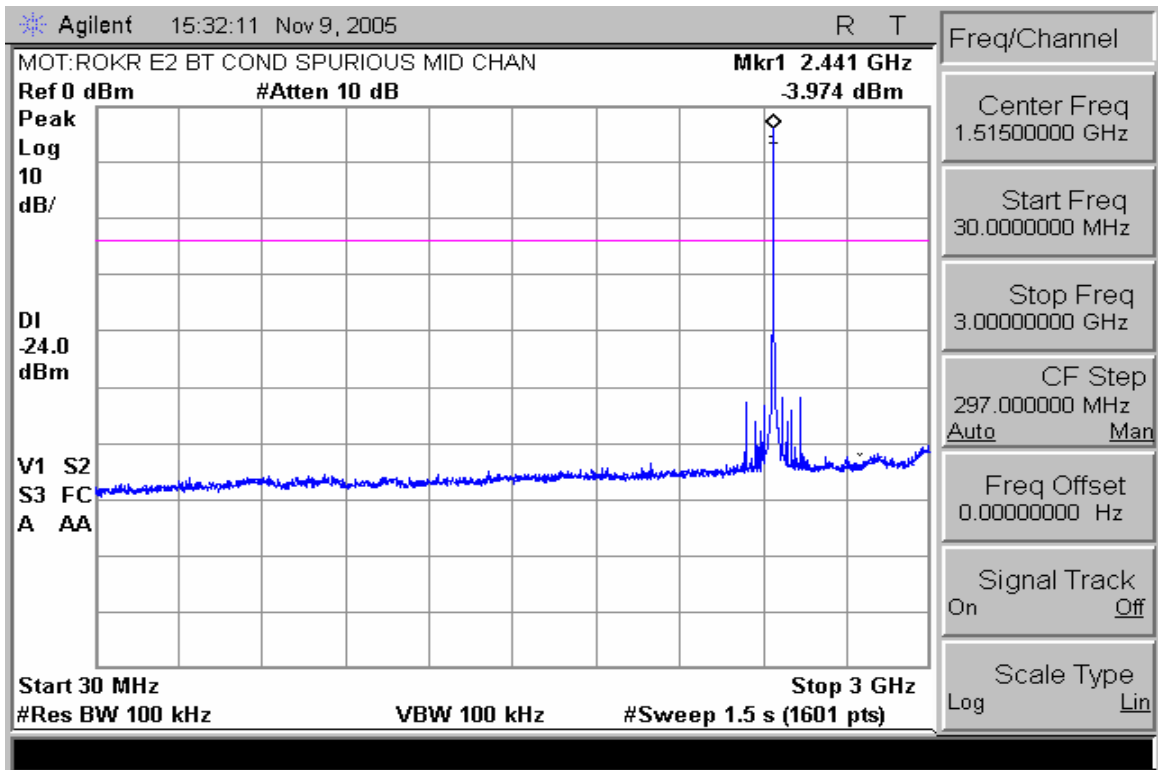
**Conducted Spurious Emissions 2-10GHz (Low Channel Enabled)**



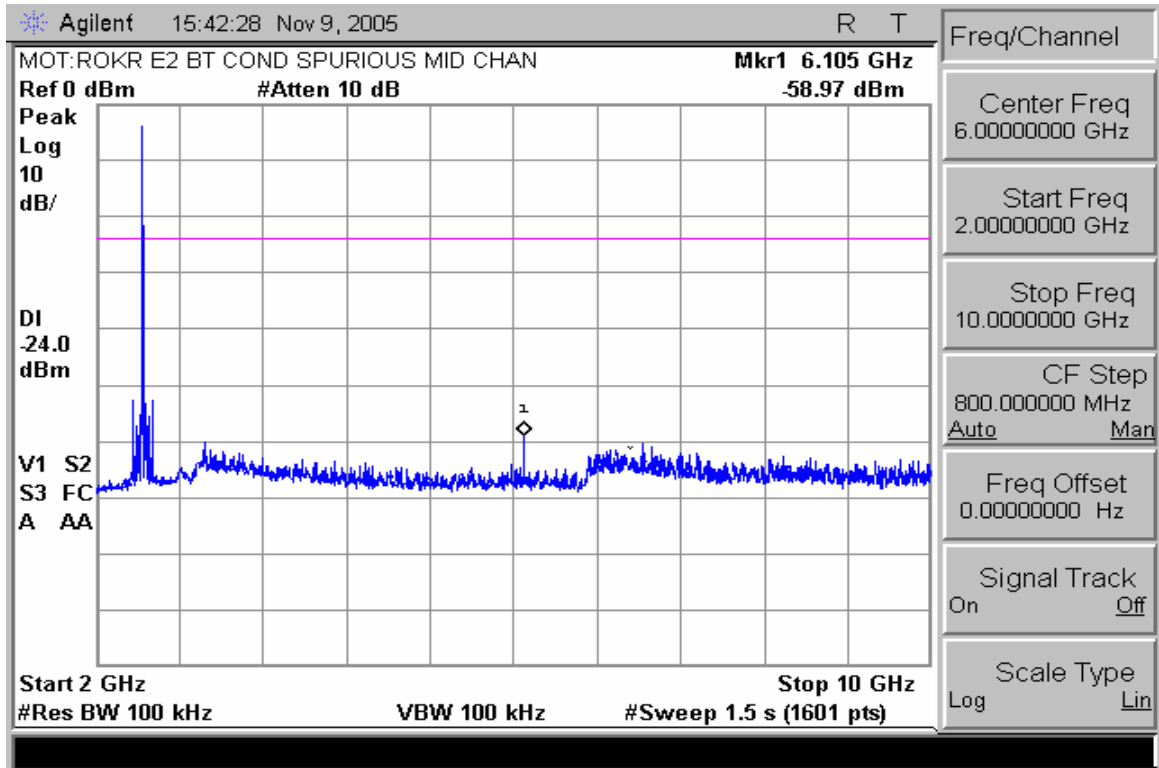
Conducted Spurious Emissions 10-20GHz (Low Channel Enabled)



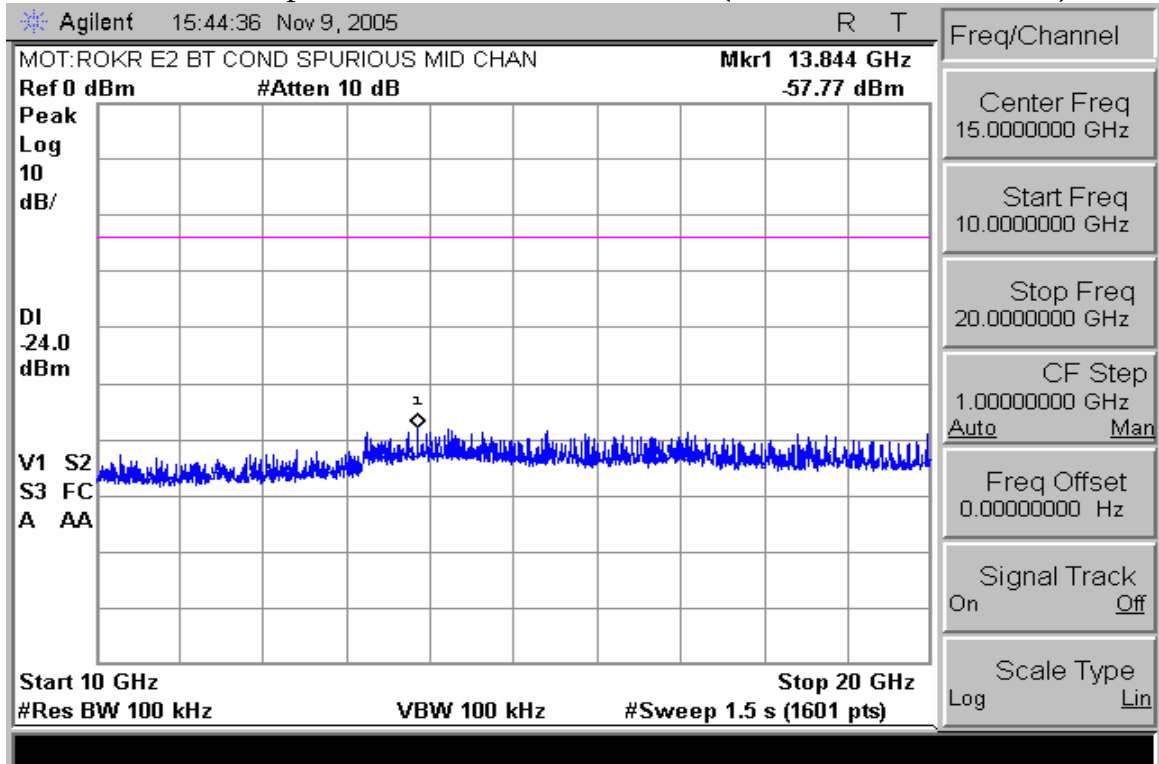
Conducted Spurious Emissions 20-26.5GHz (Low Channel Enabled)



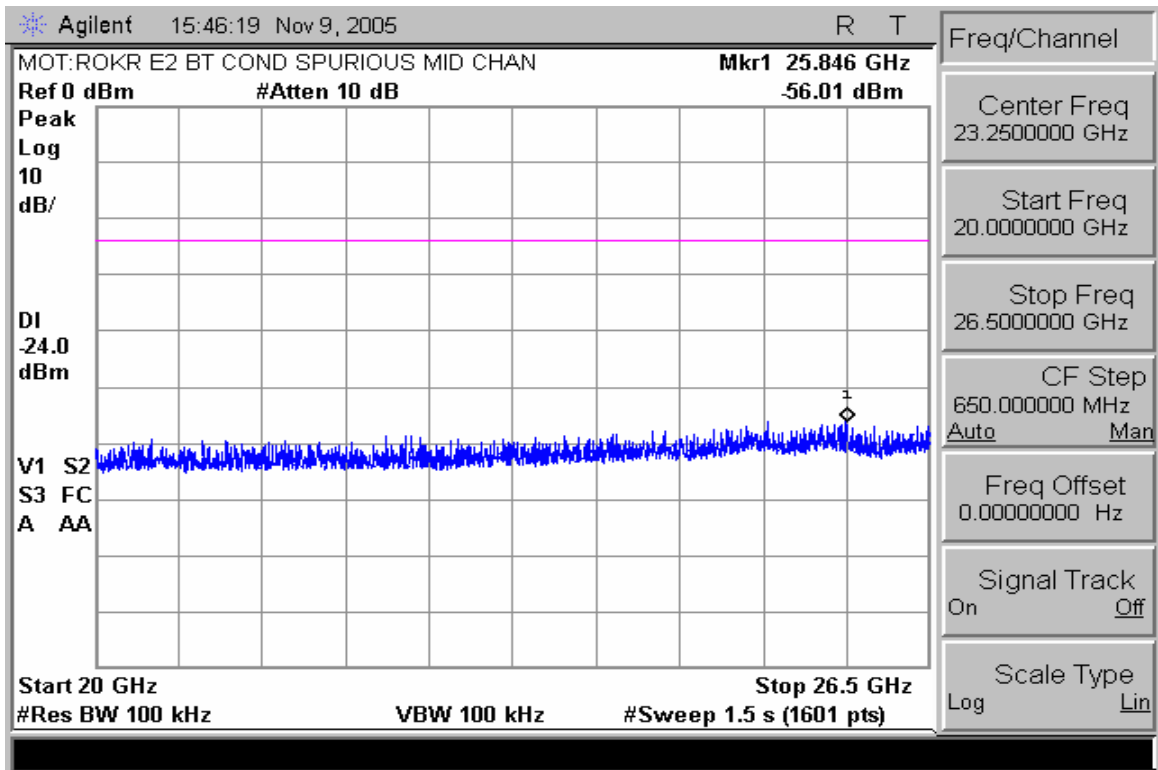
Conducted Spurious Emissions 30-3000MHz (Mid Channel Enabled)



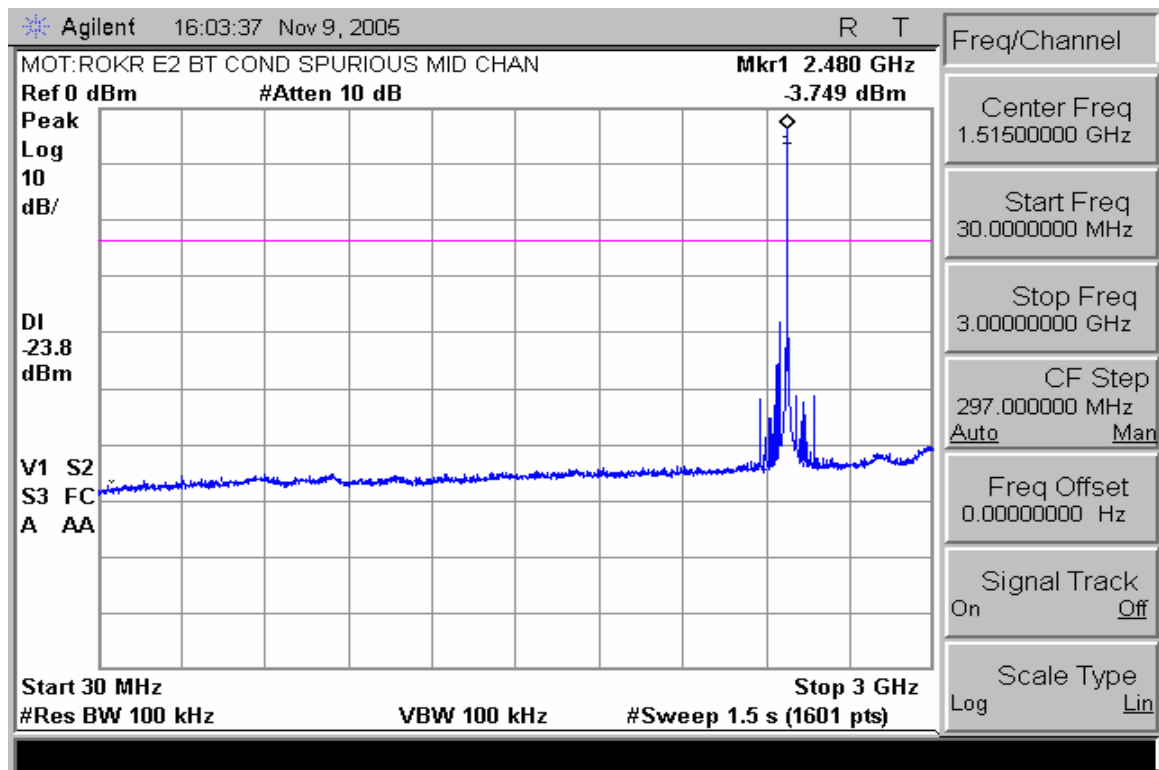
Conducted Spurious Emissions 2-10GHz (Mid Channel Enabled)



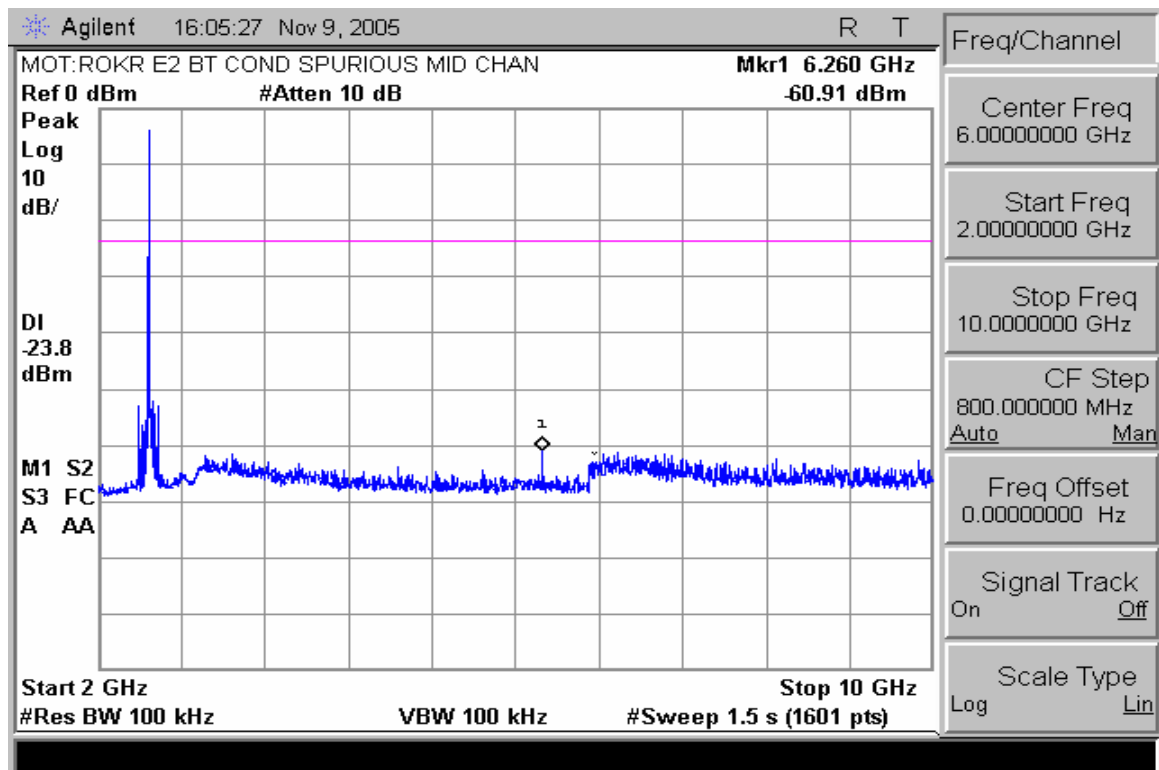
Conducted Spurious Emissions 10-20GHz (Mid Channel Enabled)



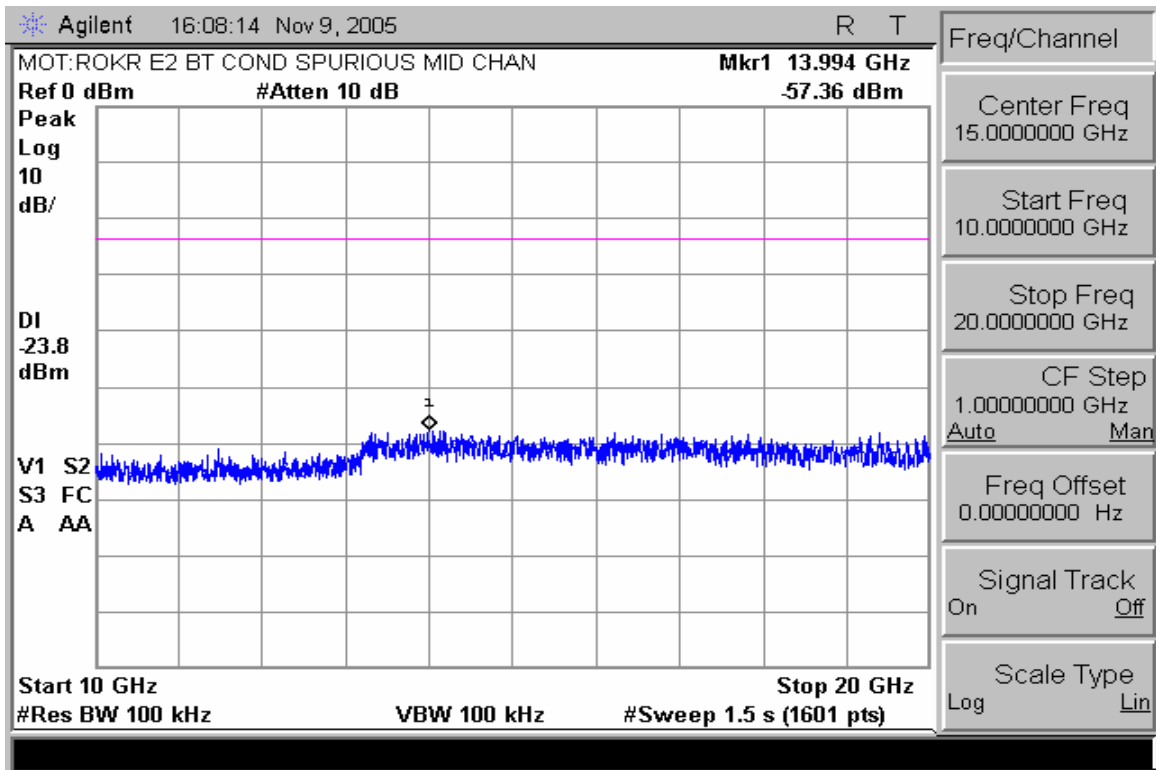
Conducted Spurious Emissions 20-26.5GHz (Mid Chan Enabled)



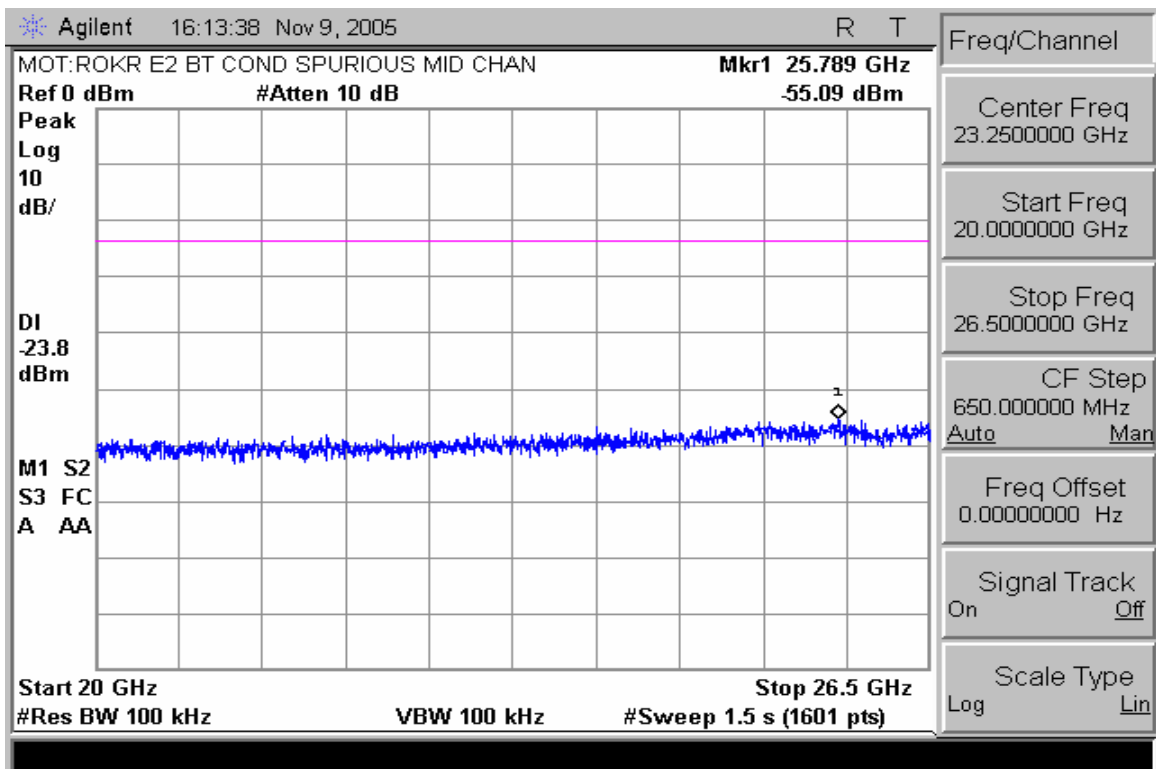
**Conducted Spurious Emissions 30-3000MHz (High Channel Enabled)**



**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

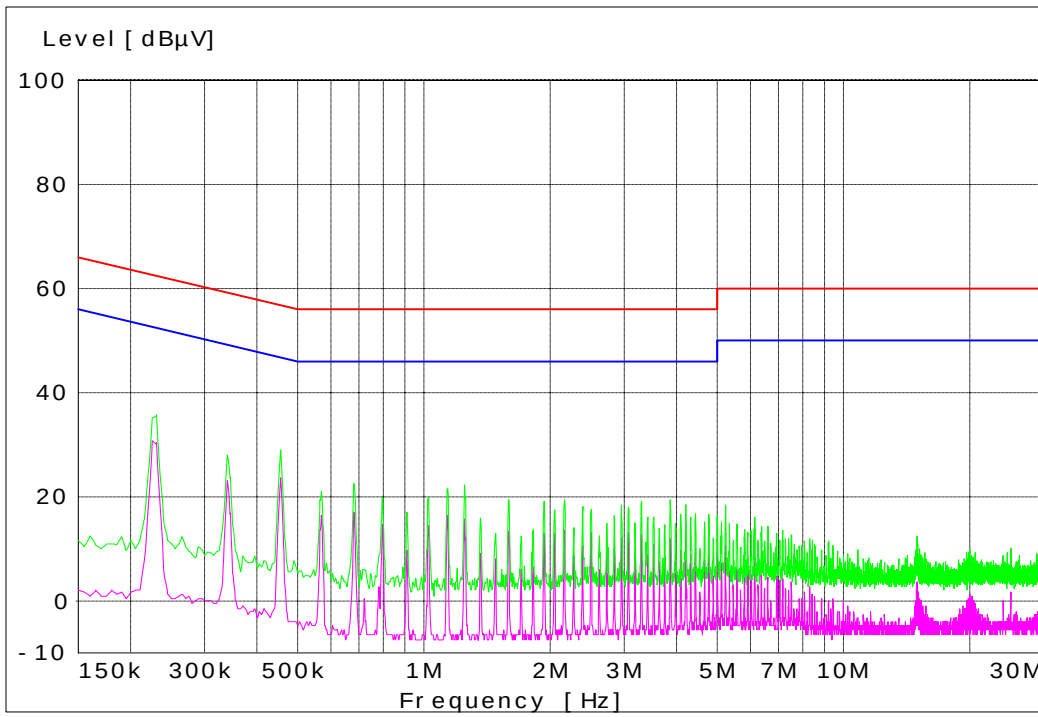
### **Measurement Procedure**

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

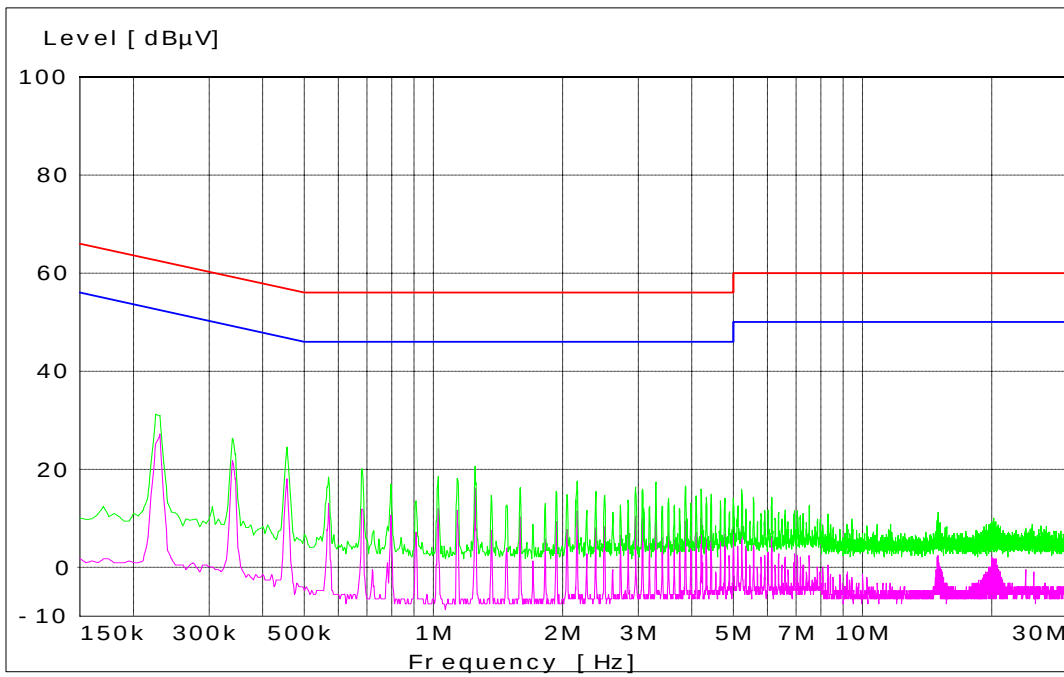
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using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

### **Measurement Results**

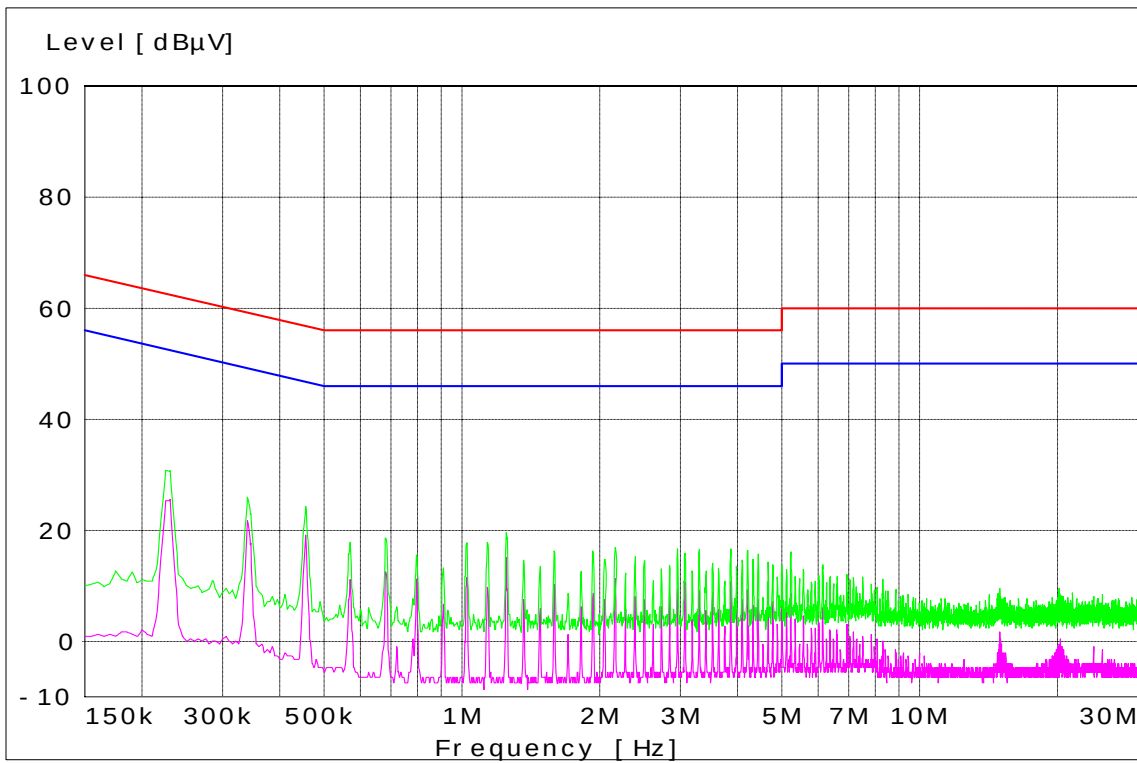
See attached:



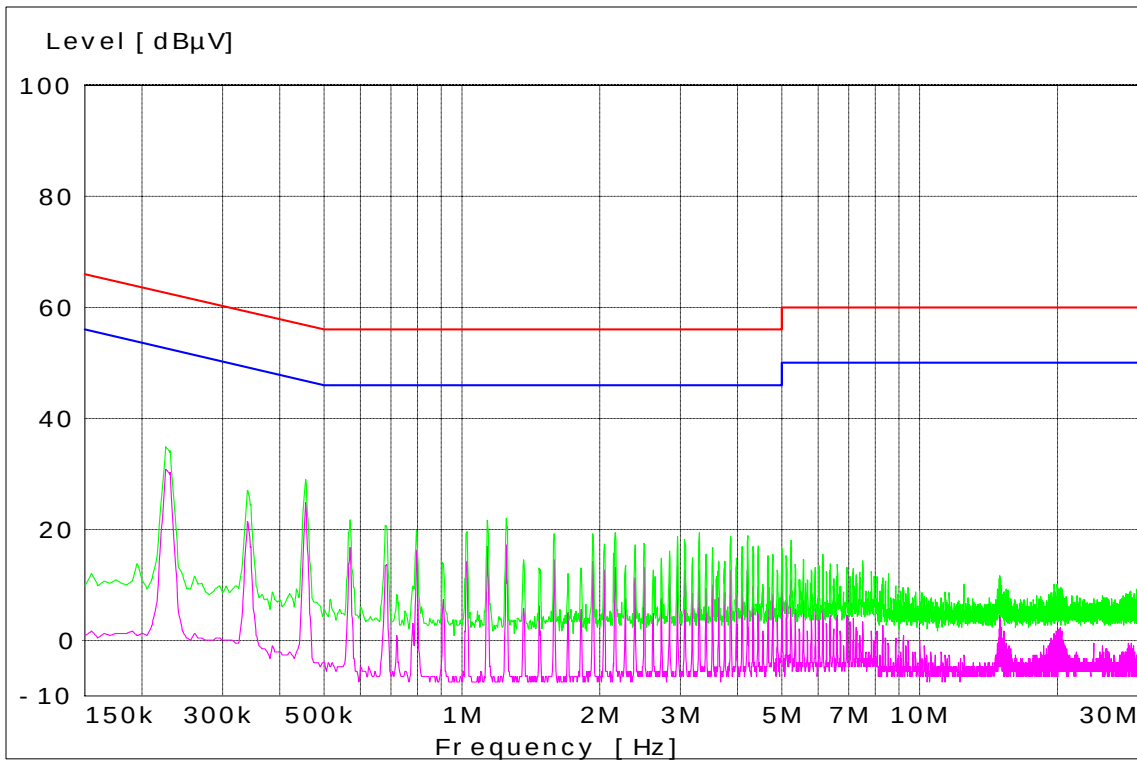
**Bluetooth Channel 0 2402MHz - Tx Mode - Neutral Coupling Hopping**



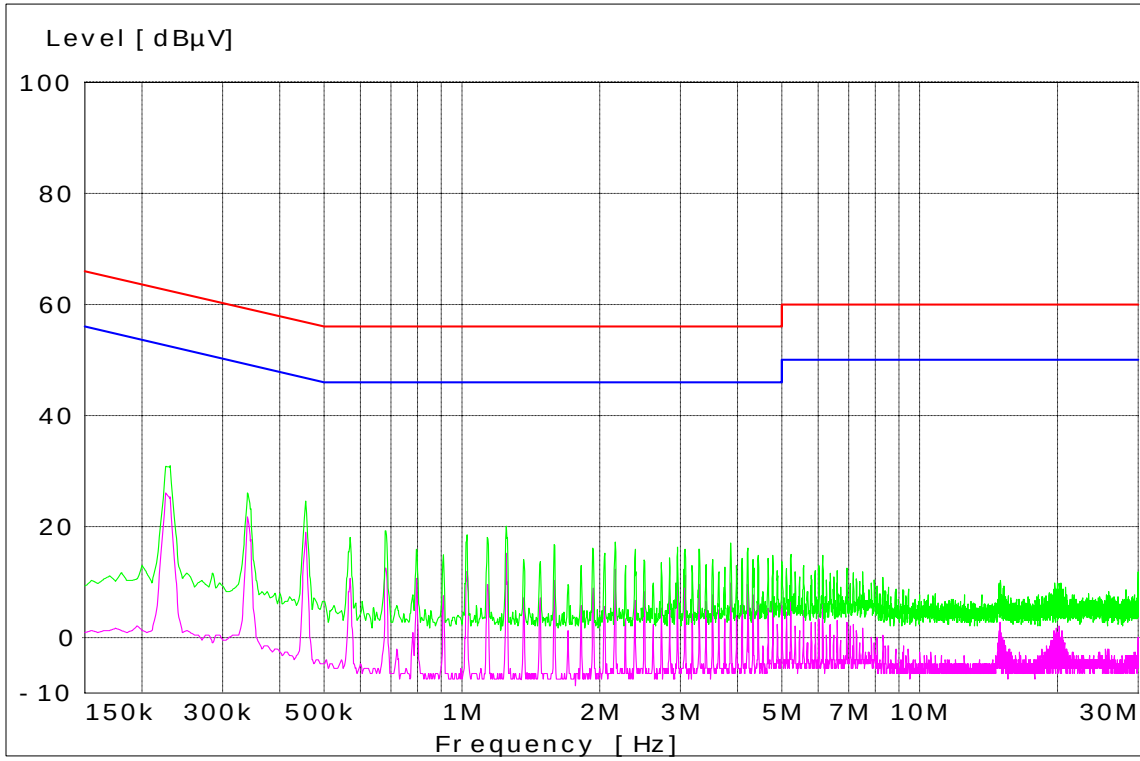
**Bluetooth Channel 0 2402MHz - Tx Mode – Line Coupling Nonhopping**



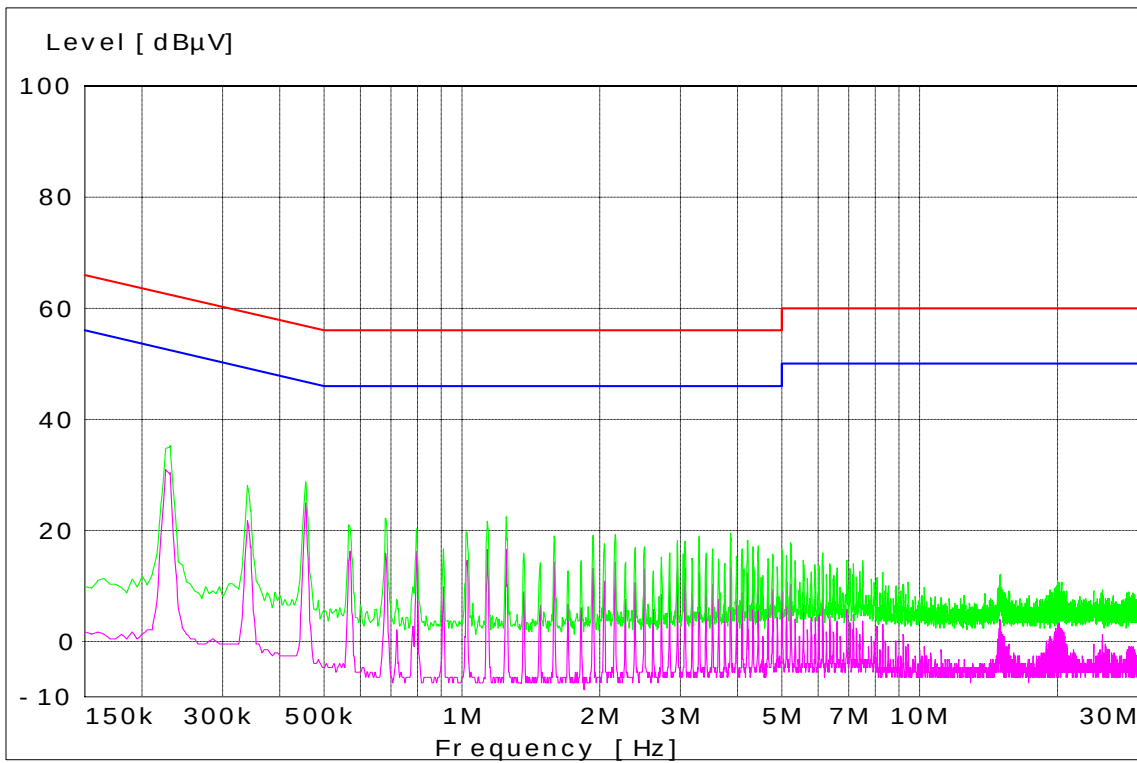
**Bluetooth Channel 39 2441MHz - Tx Mode - Line Coupling  
Nonhopping**



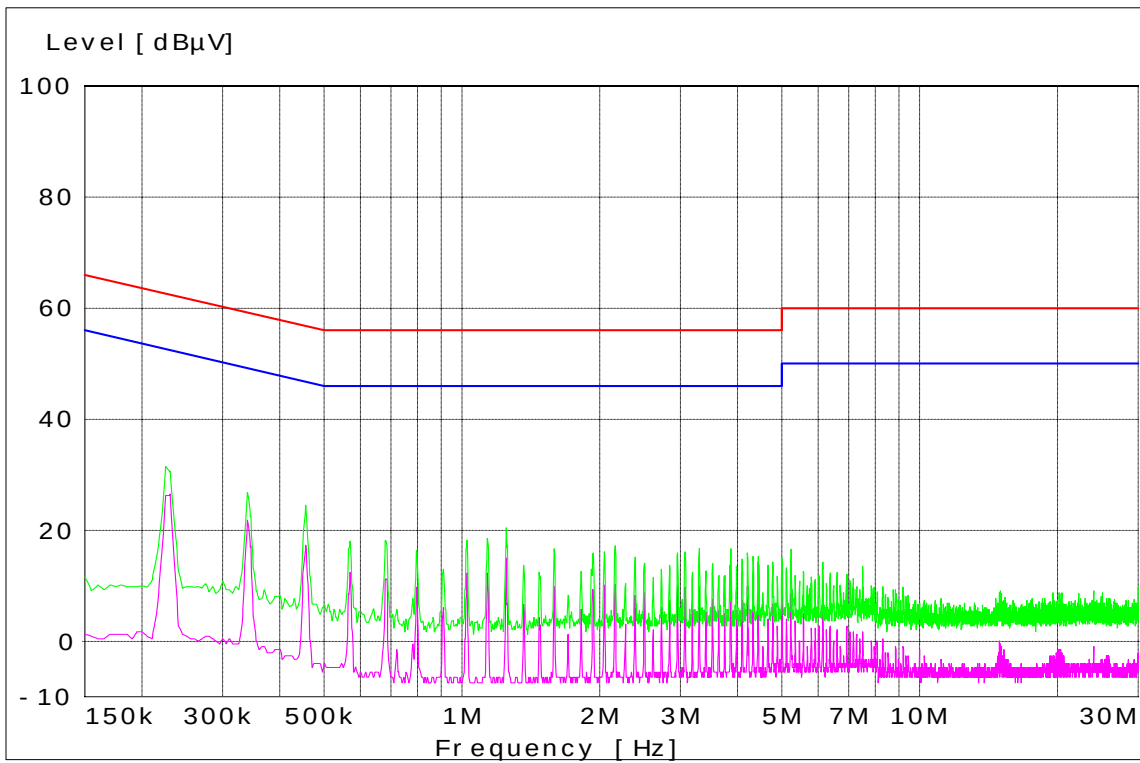
**Bluetooth Channel 39 2441MHz - Tx Mode - Neutral Coupling Hopping**



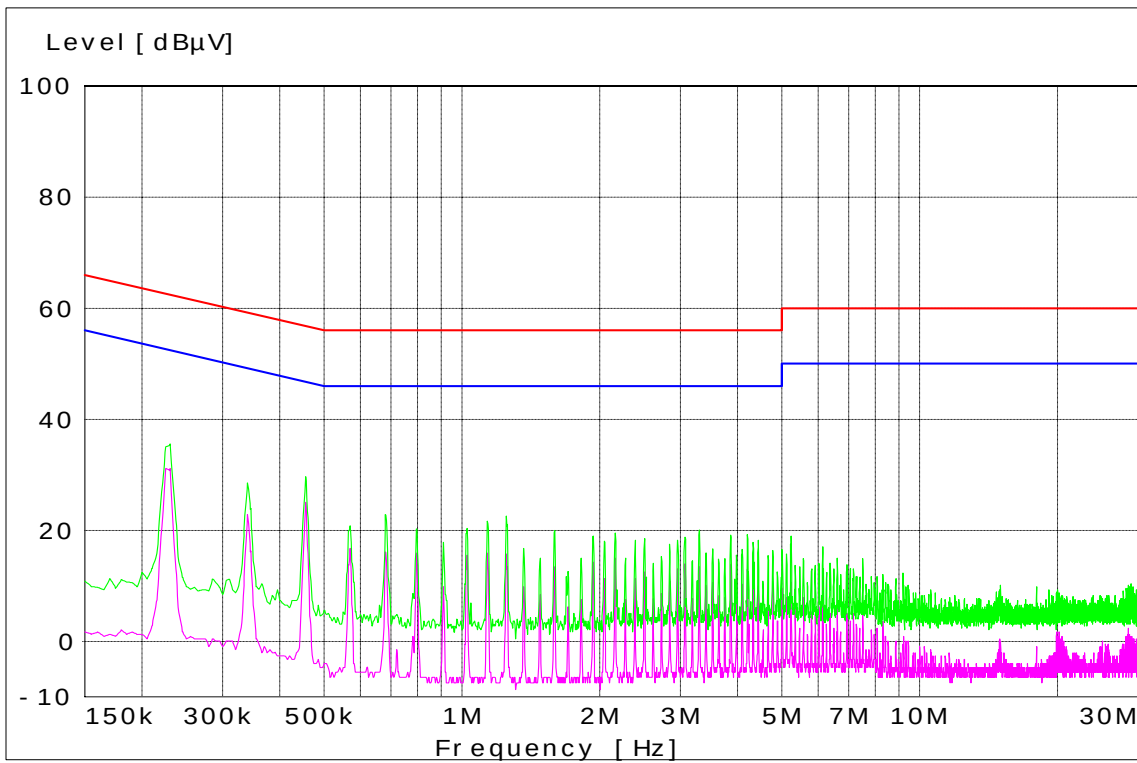
**Bluetooth Channel 78 2480MHz - Tx Mode - Line Coupling Hopping**



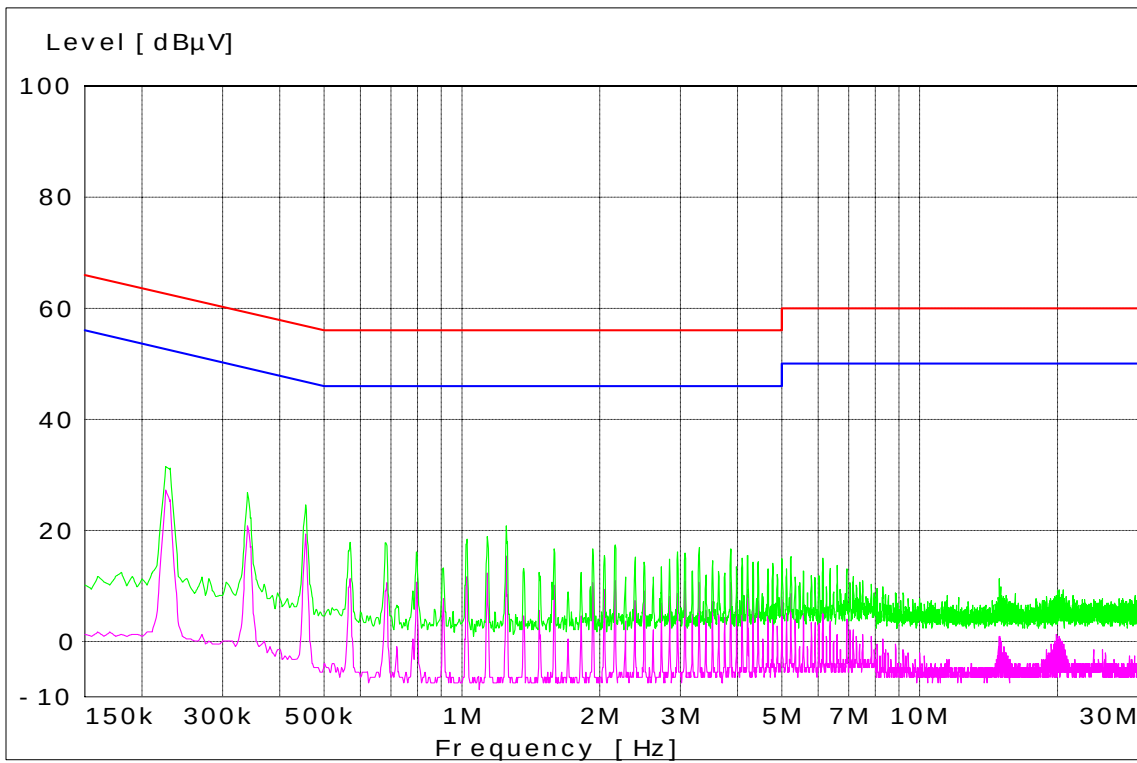
**Bluetooth Channel 78 2480MHz - Tx Mode - Neutral Coupling Hopping**



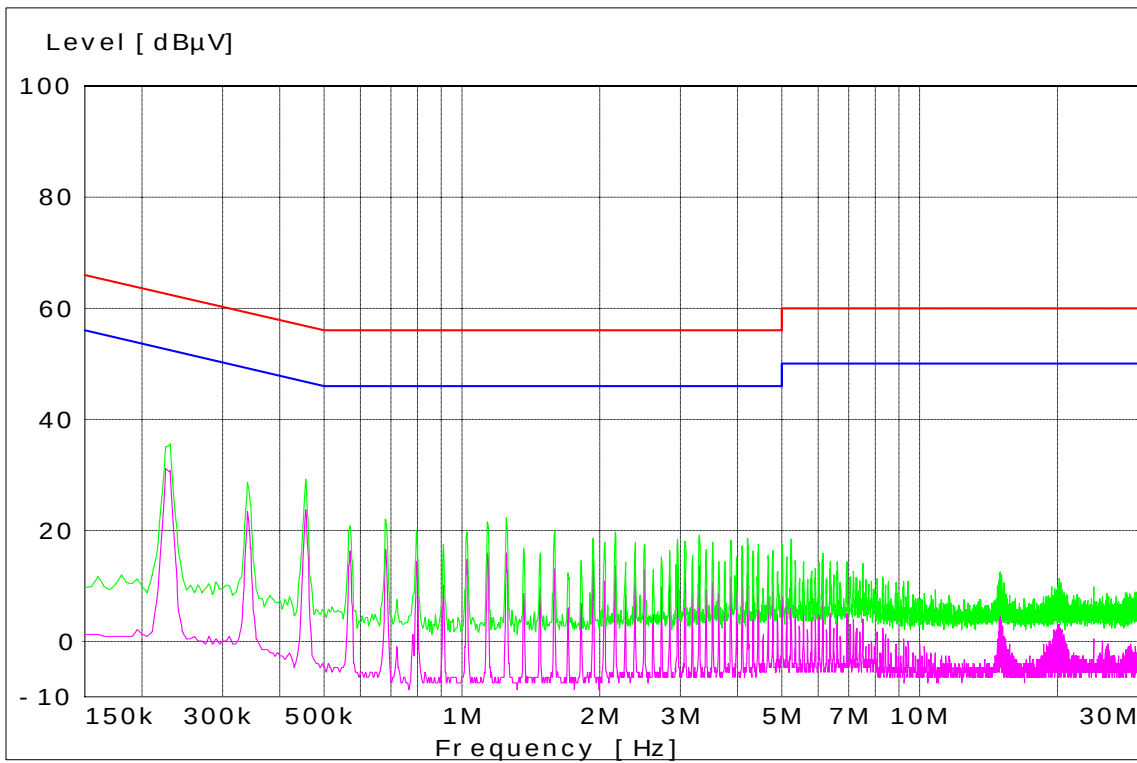
**Bluetooth Channel 0 2402MHz - Tx Mode - Line Coupling Hopping**



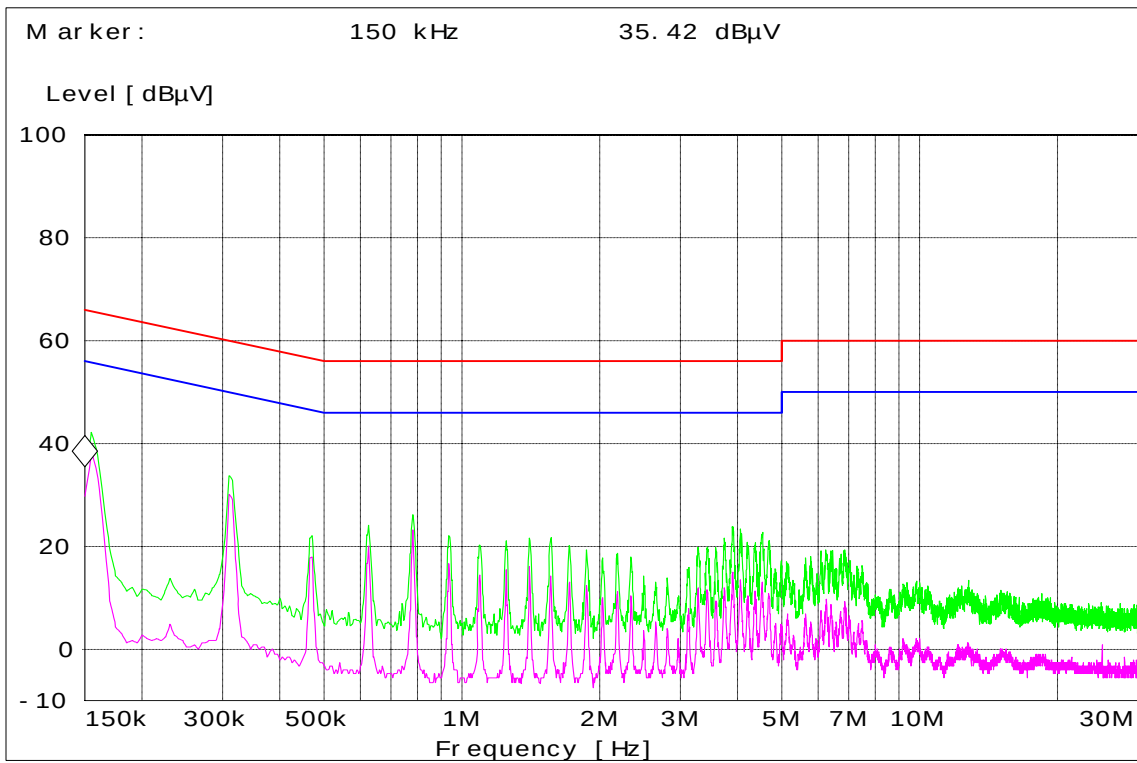
**Bluetooth Channel 0 2402MHz - Tx Mode - Neutral Coupling  
Nonhopping**



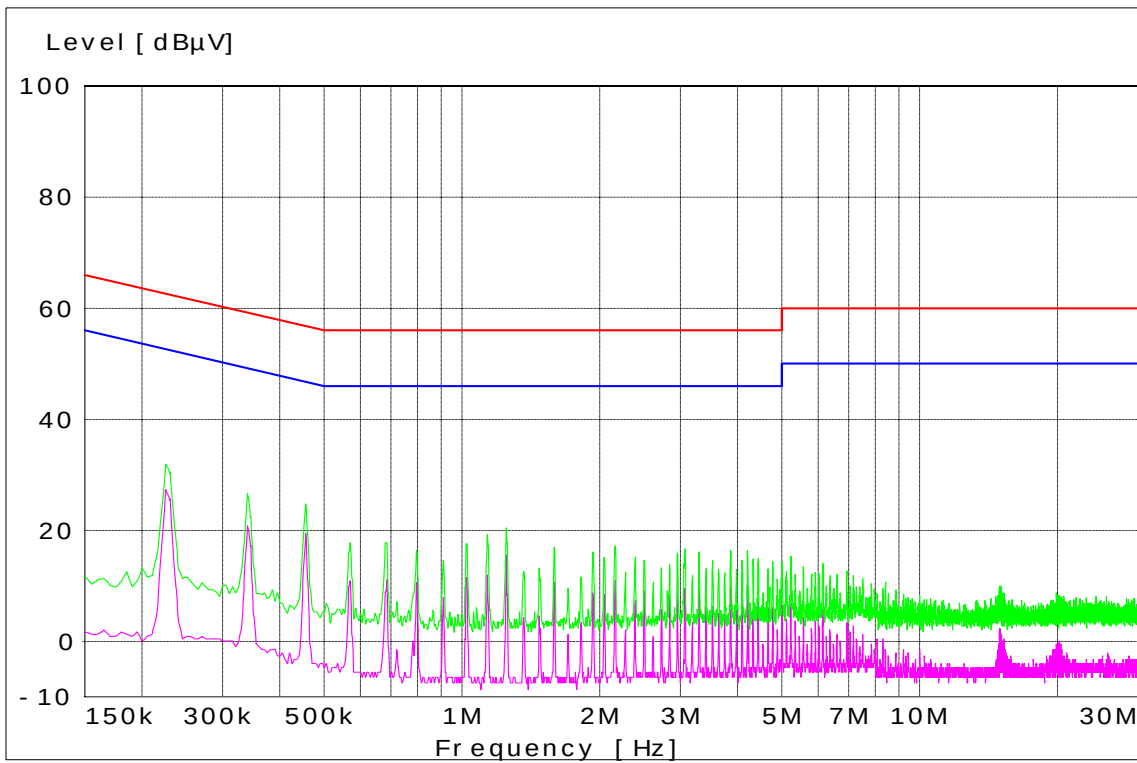
**Bluetooth Channel 39 2441MHz - Tx Mode - Line Coupling Hopping**



**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**