

|            |                      |
|------------|----------------------|
| Applicant: | Kyocera              |
| FCC ID:    | V65E4210             |
| Report #:  | CT-E4210-15C-0711-R0 |

## RF Emissions Test Report

FCC Part 15.247

For

Kyocera Corporation  
c/o Kyocera Communication Inc.

|          |                      |
|----------|----------------------|
| Product: | Dual-Band CDMA Phone |
| Model:   | E4210                |

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**ATTESTATION**

The tested device complies with the requirements in respect of all parameters subject to the test.  
 The test results and statements relate only to the items tested.  
 The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.  
 The test methods were consistent with the methods described in the relevant standards.

|                                   |  |
|-----------------------------------|--|
| <b>Product:</b>                   | Dual-Band CDMA Cellular Phone with Bluetooth+EDR   |
| <b>Model #:</b>                   | E4210  |
| <b>FCC ID:</b>                    | V65E4210   |
| <b>Tested in accordance with:</b> | FCC Part 15.247  |
| <b>Test performed by:</b>         | Comptest Services LLC  |
| <b>Test Requested by:</b>         | KYOCERA Corporation<br>C/o KYOCERA Communication Inc<br>9520 Towne Centre Drive<br>San Diego, CA 92121 |
| <b>Date of Test:</b>              | July 20, 2011  |

**Responsible Engineer**

*Benjamin Nguyen*

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Benjamin Nguyen  
Test Engineer

**Reviewed and approved by:**

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Tammy To  
Quality Manager

## 1 SUMMARY OF TESTING

| Section # | Rule Part   | Test Description                            | Verdict |
|-----------|---|---|---------|
| 4         | FCC § 15.247 b1, IC RSS-210 §A8.4 (2)                 | Peak Output Power                           | Pass    |
| 5         | FCC § 15.247 a1, IC RSS-210 §6.2.2(o) a1              | 20 dB Bandwidth                             | Pass    |
| 6         | FCC § 15.247 a1, IC RSS-210 §A8.1(2)                  | Carrier Frequency Separation                | Pass    |
| 7         | FCC § 15.247 a1 iii, IC RSS-210 §A8.1 (4)             | Number of Hopping Frequencies               | Pass    |
| 8         | FCC § 15.247 a1 iii, § 15.247 f, IC RSS-210 §A8.1 (4) | Time of Occupancy                           | Pass    |
| 9         | FCC § 15.247 d, IC RSS-210 §A8.5                      | Band-edge Compliance of Conducted Emissions | Pass    |
| 10        | FCC § 15.247 d, IC RSS-210 §A8.5                      | Spurious RF Conducted Emissions             | Pass    |
| 11        | FCC § 15.107 § 15.207, IC RSS-210 §6.6                | AC Power Line Conducted Emissions           | Pass    |
| 12        | FCC § 15.109, § 15.209, IC RSS-210 §A2.9(2)           | Spurious Radiated Emissions                 | Pass    |

## 2 EQUIPMENT UNDER TEST INFORMATION

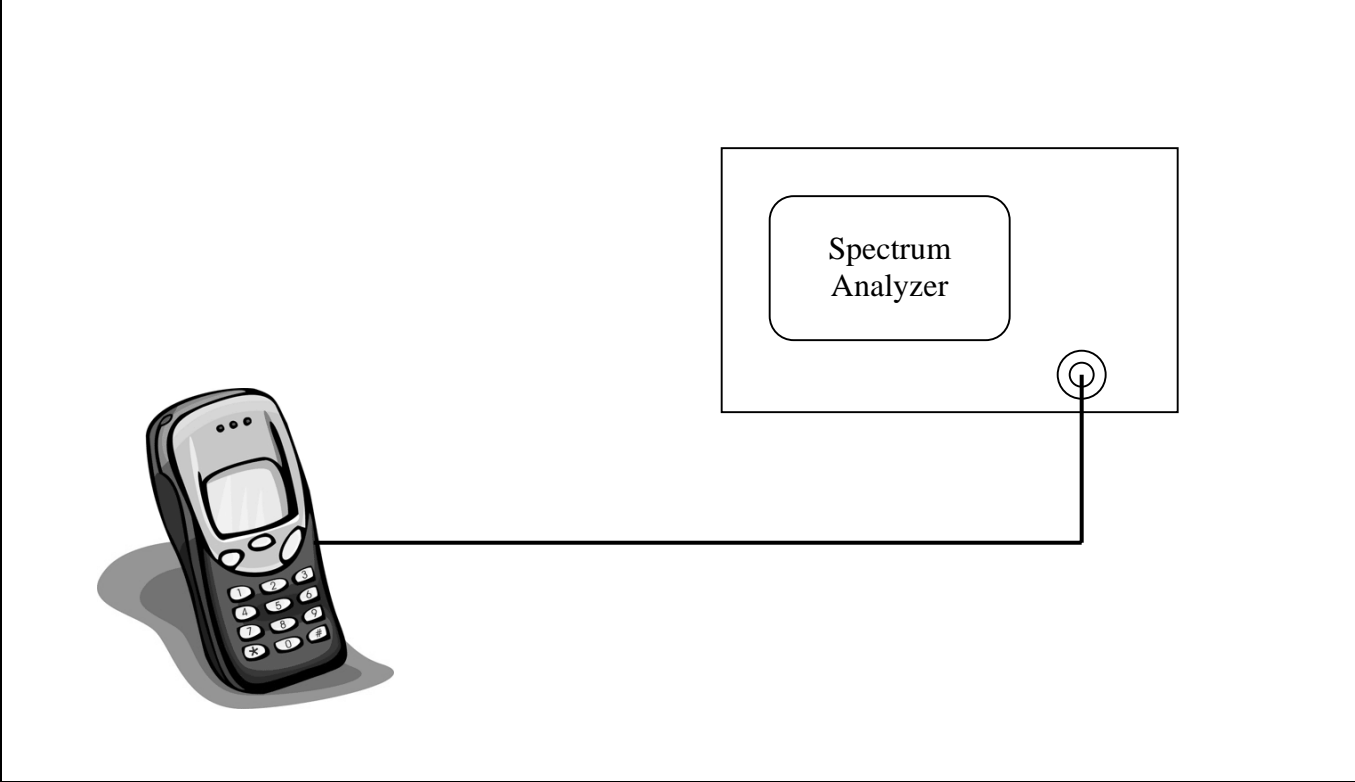
|                                |  |
|--------------------------------|--|
| <b>EUT Serial Number:</b>      | 268435457816720200   |
| <b>Type:</b>                   | <input type="checkbox"/> Prototype, <input checked="" type="checkbox"/> Pre-Production, <input type="checkbox"/> Production          |
| <b>Equipment Category:</b>     | Portable   |
| <b>TX Frequency (MHz):</b>     | 2402 to 2480   |
| <b>Channel Numbers:</b>        | 79   |
| <b>Channel Spacing (MHz):</b>  | 1  |
| <b>Bluetooth version:</b>      | <input type="checkbox"/> 1.1 <input type="checkbox"/> 1.2 <input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 + EDR |
| <b>Modulation:</b>             | Frequency Hopping Spread Spectrum (FHSS), Class 2  |
| <b>Max. Output Power (dBm)</b> | 2.44 dBm   |
| <b>Antenna:</b>                | Internal   |
| <b>Antenna Gain (dBi):</b>     | -1.0 (Peak)  |

### 3 TEST FACILITIES

The test sites and measurement facilities used to collect data are located at 8611 Balboa Avenue, San Diego, CA 92123, USA

### 4 TEST SETUP

The Bluetooth RF output of the equipment under test (EUT) was connected to the input of the spectrum analyzer through a RF cable with a specialized RF connector. The amplitude of the spectrum analyzer is corrected for the cable insertion loss and any other applicable losses. A fully charged battery was used as power supply voltage.



## 5 PEAK OUTPUT POWER

### 5.1 Test Configuration

**FCC:** § 15.247 b1

**IC:** RSS-210 §A8.4 (2)

The Bluetooth transmitter was enabled at low, mid and high channels of separately to investigate the peak output power for each channel.

**Frequencies of Interest:** Spectrum was investigated from 2400 MHz – 2483.5 MHz.

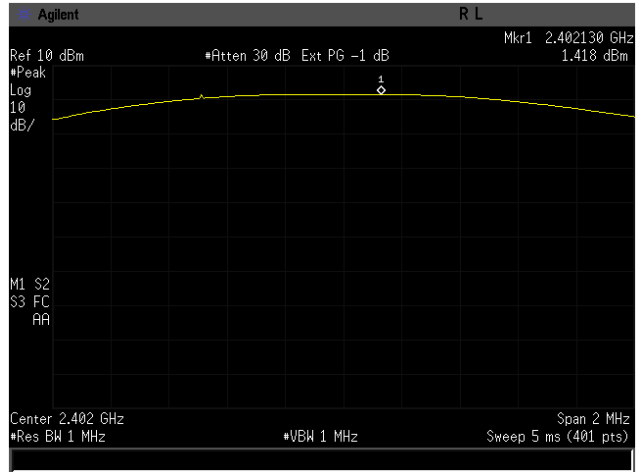
**Limits:** < 1 watt (for systems with at least 75 hopping channels)

### 5.2 Results and Limits:

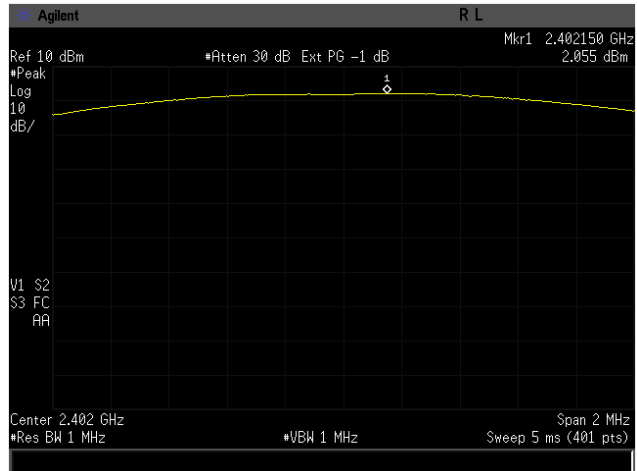
| Figure | Channel | Modulation | Results  |
|--------|---------|------------|----------|
| 5-1    | 0       | Basic Rate | 1.42 dBm |
| 5-1a   |         | EDR DQPSK  | 2.06 dBm |
| 5-1b   |         | EDR D8PSK  | 2.16 dBm |
| 5-2    | 39      | Basic Rate | 1.07 dBm |
| 5-2a   |         | EDR DQPSK  | 1.41 dBm |
| 5-2b   |         | EDR D8PSK  | 1.63 dBm |
| 5-3    | 78      | Basic Rate | 0.62 dBm |
| 5-3a   |         | EDR DQPSK  | 0.70 dBm |
| 5-3b   |         | EDR D8PSK  | 0.93 dBm |

**Comments:** Within Bluetooth Power Class 2 limit

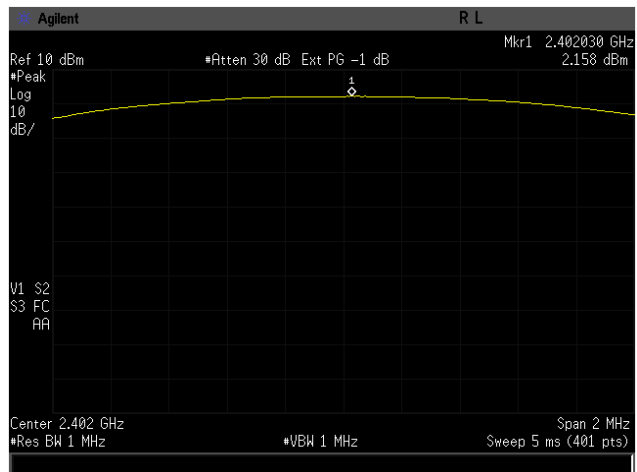
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**Figure 5-1: Peak Output Power, Basic Rate Channel 0.**

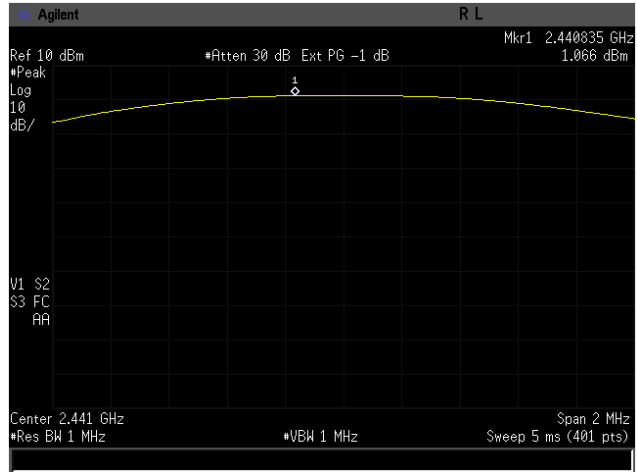


**Figure 5-1a: Peak Output Power, EDR DQPSK Channel 0.**

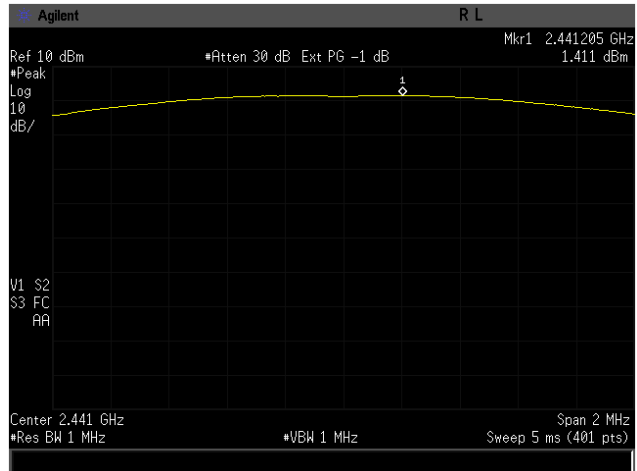


**Figure 5-1b: Peak Output Power, EDR D8PSK Channel 0.**

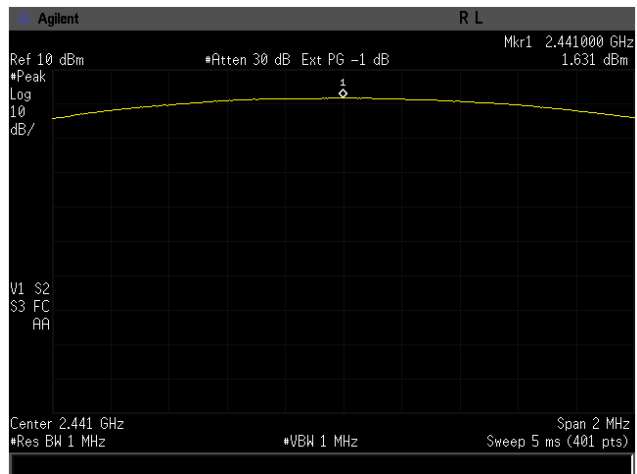
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**Figure 5-2: Peak Output Power, Channel 39.**



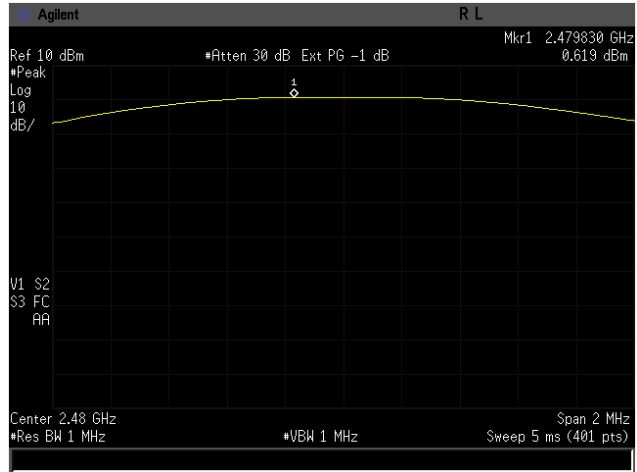
**Figure 5-2a: Peak Output Power, EDR DQPSK Channel 39.**



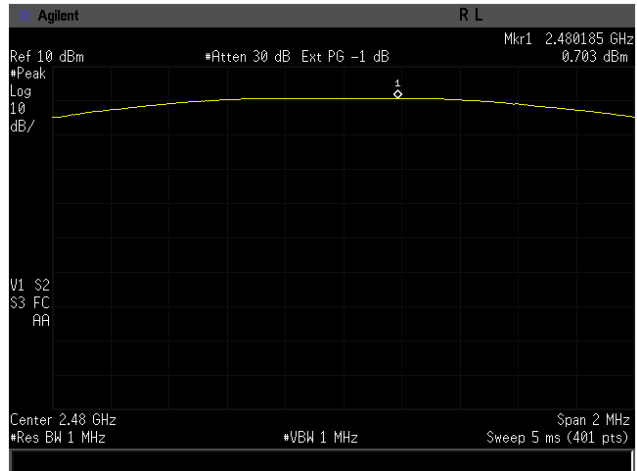
**Figure 5-2b: Peak Output Power, EDR D8PSK Channel 39.**



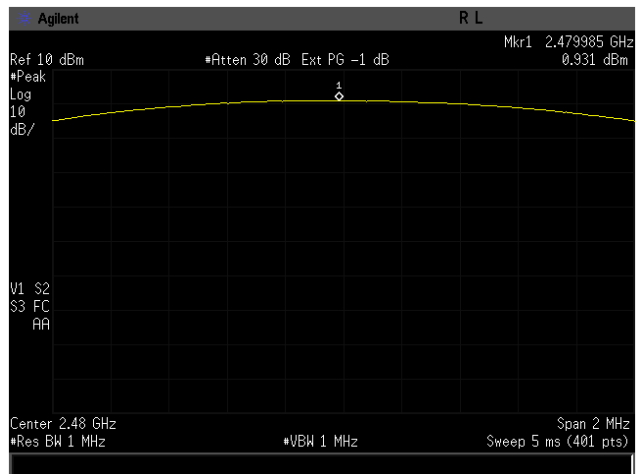
|            |                      |
|------------|----------------------|
| Applicant: | Kyocera              |
| FCC ID:    | V65E4210             |
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**Figure 5-3: Peak Output Power, Channel 78.**



**Figure 5-3a: Peak Output Power, EDR DQPSK Channel 78.**



**Figure 5-3b: Peak Output Power, EDR D8PSK Channel 78.**

## 6 20 DB BANDWIDTH

### 6.1 Test Configuration

|  |                             |
|--|-----------------------------|
| <b>FCC:</b>  | <b>§ 15.247 a1</b>          |
| <b>IC:</b>   | <b>RSS-210 §6.2.2(o) a1</b> |
| <p>The Bluetooth transmitter was enabled at low, mid, high channels and at each supporting modulation scheme separately to investigate the 20dB-bandwidth for each channel. Delta marker on the spectrum analyzer was moved from the center frequency until -20dBc to measure the 20dB-bandwidth.</p> <p><b>Frequencies of Interest:</b> Spectrum was investigated from 2402 MHz – 2480 MHz.</p> |                             |

### 6.2 20dB Bandwidth Plots and Results

| Figure | Channel | Modulation | Results  |
|--------|---------|------------|----------|
| 6-1a   | 0       | Basic Rate | 815 kHz  |
| 6-1b   |         | EDR DQPSK  | 1.18 MHz |
| 6-2c   |         | EDR D8PSK  | 1.19 MHz |
| 6-2a   | 39      | Basic Rate | 805 kHz  |
| 6-2b   |         | EDR DQPSK  | 1.13 MHz |
| 6-2c   |         | EDR D8PSK  | 1.18 MHz |
| 6-3a   | 78      | Basic Rate | 845 kHz  |
| 6-3b   |         | EDR DQPSK  | 1.15 MHz |
| 6-3c   |         | EDR D8PSK  | 1.21 MHz |

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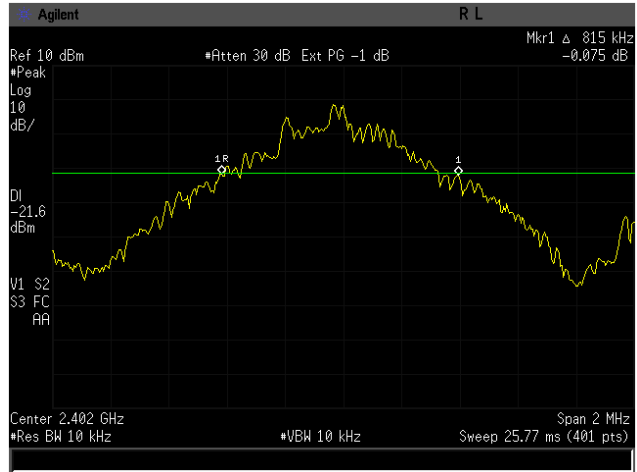


Figure 6-1a: 20dB Bandwidth Basic rate, Channel 0.



Figure 6-1b: 20dB Bandwidth EDR DQPSK, Channel 0.



Figure 6-1c: 20dB Bandwidth EDR D8PSK, Channel 0.

|            |                      |
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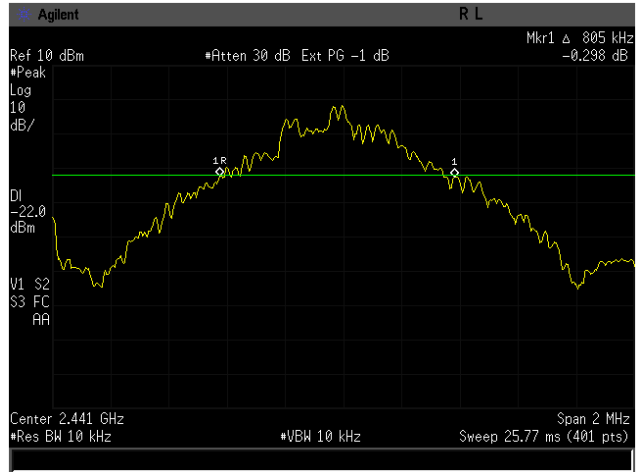


Figure 6-2a: 20dB Bandwidth Basic rate, Channel 39.



Figure 6-2b: 20dB Bandwidth EDR DQPSK, Channel 39.



Figure 6-2c: 20dB Bandwidth EDR D8PSK, Channel 39.

|            |                      |
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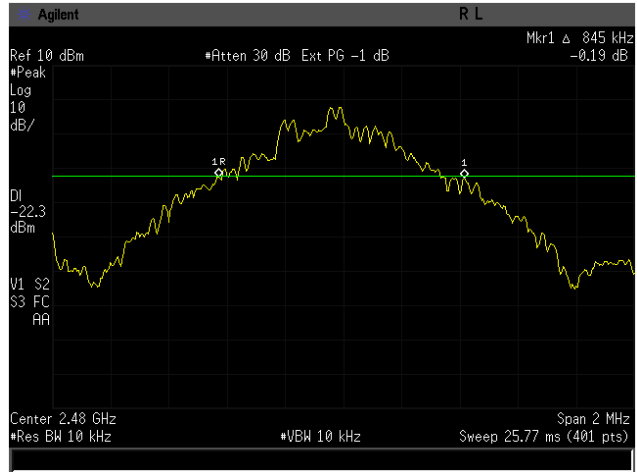


Figure 6-3a: 20dB Bandwidth Basic rate, Channel 78.



Figure 6-3b: 20dB Bandwidth EDR DQPSK, Channel 78.



Figure 6-3c: 20dB Bandwidth EDR D8PSK, Channel 78.

## 7 CARRIER FREQUENCY SEPARATION

### 7.1 Test Configuration

**FCC:** § 15.247 a1

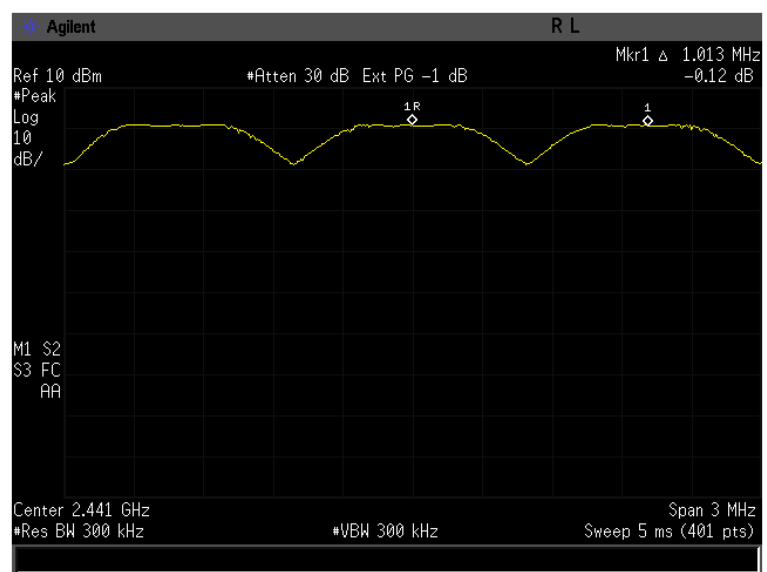
**IC:** RSS-210 §A8.1(2)

The Bluetooth transmitter was set in hopping mode to investigate the carrier frequency separation between mid-channel and its adjacent channels. The carrier frequency separation is independent of modulation and packet length (DH1, DH3, etc.).

- Limits:**
- a)  $\geq 25$  kHz or 20 dB Bandwidth, whichever is greater
  - b) For FH systems operating in 2400-2483.5MHz and with output power less than 125mW the carrier frequency separation should be greater than 25kHz or 2/3 of 20dB Bandwidth.

### 7.2 Results: Carrier Frequency

| Figure | Frequency Separation | Limits<br>> 2/3 of 20 dB Bandwidth                    | Result |
|--------|----------------------|---|--------|
| 7      | 1.01MHz              | 807 kHz<br><small>(2/3)*1.21 MHz = 806.67 kHz</small> | Pass   |



**Figure 7: Carrier Frequency Separation between channels 38, 39 (mid-channel) & 40.**

## 8 NUMBER OF HOPPING FREQUENCIES

### 8.1 Test Configuration

|             |                   |
|-------------|-------------------|
| <b>FCC:</b> | § 15.247 a1 iii   |
| <b>IC:</b>  | RSS-210 §A8.1 (4) |

The Bluetooth transmitter was set in hopping mode to investigate the number of hopping frequencies. The number of frequency hopping is independent of modulation and packet length (DH1, DH3, etc.).

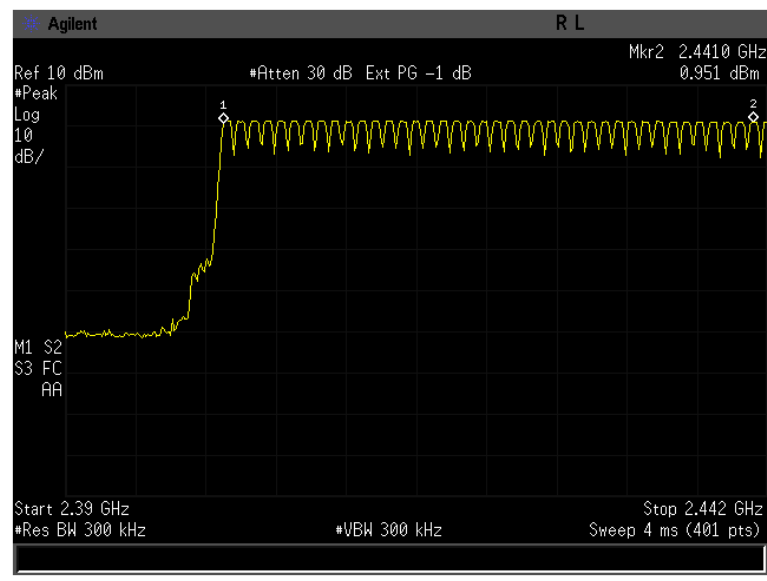
**Limits:**

At least 15 non-overlapping channels

### 8.2 Results: Number of Hopping Frequencies

| Figure | Channel | Plot Description                               | Results         |
|--------|---------|--|-----------------|
| 8a     | Hopping | Number of Hopping Frequencies (Channels 0-39)  | 79              |
| 8b     |         | Number of Hopping Frequencies (Channels 39-78) | (Channels 0-78) |

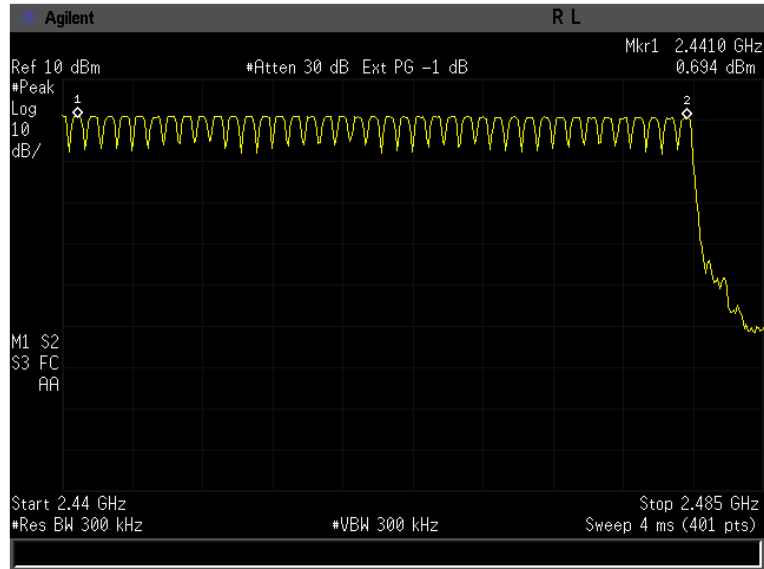
**Comments: Pass**



**Figure 8a: Number of Hopping Frequencies (Channels 0-39).**



|            |                      |
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**Figure 8b: Number of Hopping Frequencies (Channels 39-78).**



## 9 TIME OF OCCUPANCY (DWELL TIME)

### 9.1 Test Configuration

|             |                                    |
|-------------|------------------------------------|
| <b>FCC:</b> | <b>§ 15.247 a1 iii, § 15.247 f</b> |
| <b>IC:</b>  | <b>RSS-210 §A8.1 (4)</b>           |

The Bluetooth transmitter was set in hopping mode to capture one of the transmissions of mid-channel. Mid-channel (CH 39) was measured here.

**Comments:**  
 The dwell time is independent of modulation and packet length (DH1, DH3, etc.).

According to the Bluetooth Core Specification v1.1, we have 1600 hops in a second for a one slot packet type. One frequency hop lasts 625 μs; this increment is called a time slot. In a period of 31.6 seconds, the time of occupancy for any given channel is calculated as follows:

Duration of one transmission\*(1600 hops/sec)/(No. of time-slots)/(79 channels)\*31.6 sec

For a DH1 (1 time-slot) packet type, ideally the duration of one transmission is 625 μs. Therefore, the dwell time is given by:

$625 \mu\text{s} * 1600 / \text{s} / (1 \text{ time-slot}) / 79 * 31.6 \text{ s} = 0.4 \text{ s}$ .

Spectrum Analyzer Parameters:  
 The measurement is conducted with zero span centered at mid-channel (2441 MHz) with sweep time sufficient enough to capture one transmission (in this case,  $\geq 625 \mu\text{s}$ ).

**Limits:**  
 $\leq 0.4 \text{ s}$   
 (in a period of 31.6 s)

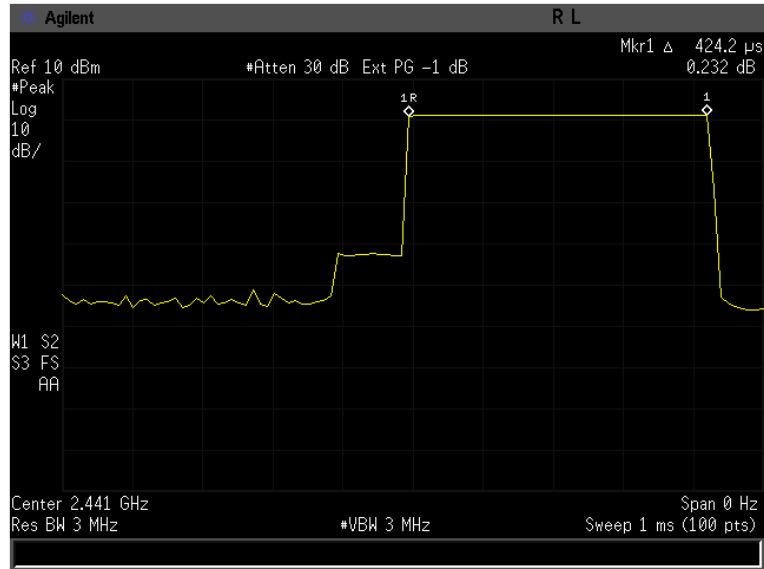
### 9.2 Results: Dwell Time

| Figure | Channel | Results |
|--------|---------|---------|
| 9      | Hopping | 0.27s   |

**Comments: PASS**



|            |                      |
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**Figure 9: Duration of one transmission (Channel 39).**

## 10 BANDEGE

### 10.1 Test Configuration

**FCC:** § 15.247 d

**IC:** RSS-210 §A8.5

The Bluetooth RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low and high channels of Bluetooth transmitter were enabled separately to investigate the band-edge compliance of conducted emissions. To ensure the band-edge compliance when the channels are hopping, measurements were also conducted at low and high channels in this mode. A fully charged battery was used as supply voltage

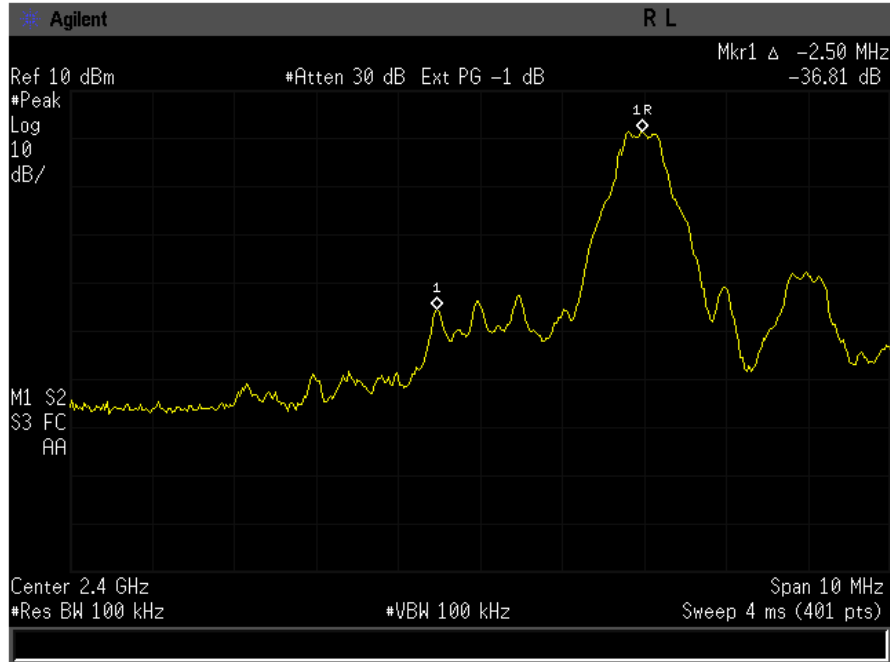
Frequencies of Interest: Spectrum was investigated from 2400 MHz – 2483.5 MHz.

Limits:  $\leq -20$  dBc

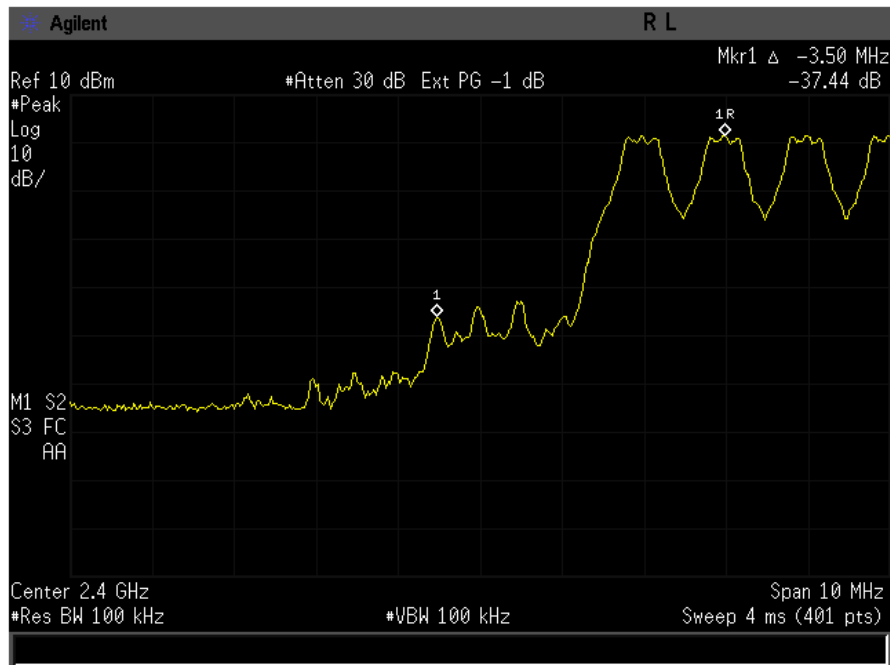
In any 100kHz band, the highest radio frequency power outside the band (2400-2483.5 MHz) is measured to be at least 20 dB below the desired power of intentional radiator within the band.

### 10.2 Results: Bandedge

| Figure | Channel/Edge         | Modulation | Plot Description | Results    |
|--------|----------------------|------------|------------------|------------|
| 10-1a  | 0 -- Low Band Edge   | Basic Rate | Hopping disabled | -36.81 dBc |
| 10-1b  |                      |            | Hopping enabled  | -37.44 dBc |
| 10-2a  |                      | EDR DQPSK  | Hopping disabled | -49.15 dBc |
| 10-2b  |                      |            | Hopping enabled  | -44.74 dBc |
| 10-3a  |                      | EDR D8PSK  | Hopping disabled | -46.50 dBc |
| 10-3b  |                      |            | Hopping enabled  | -44.31 dBc |
| 10-4a  | 78 -- High Band Edge | Basic Rate | Hopping disabled | -52.19 dBc |
| 10-4b  |                      |            | Hopping enabled  | -48.05 dBc |
| 10-5a  |                      | EDR DQPSK  | Hopping disabled | -53.76 dBc |
| 10-5b  |                      |            | Hopping enabled  | -49.44 dBc |
| 10-6a  |                      | EDR D8PSK  | Hopping disabled | -53.03 dBc |
| 10-6b  |                      |            | Hopping enabled  | -49.95 dBc |

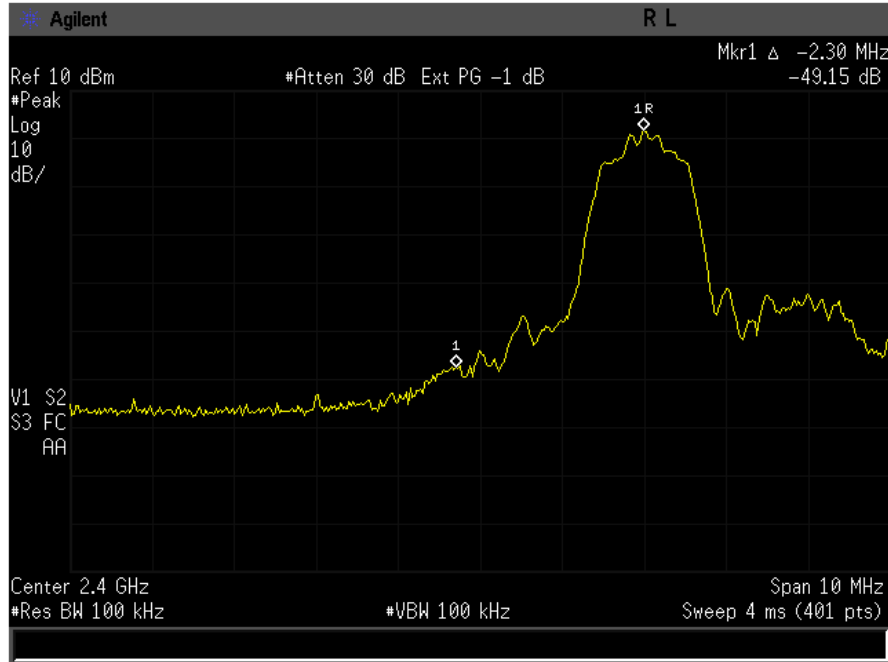


**Figure 10-1a: Basic Rate Low band edge with hopping disabled.**

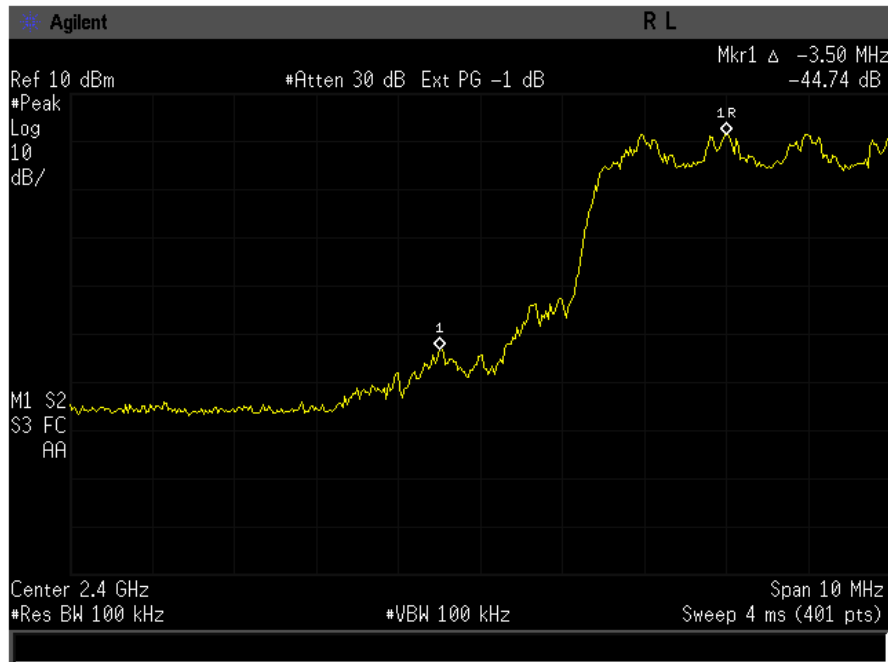


**Figure 10-1b: Basic Rate Low band edge with hopping enabled.**

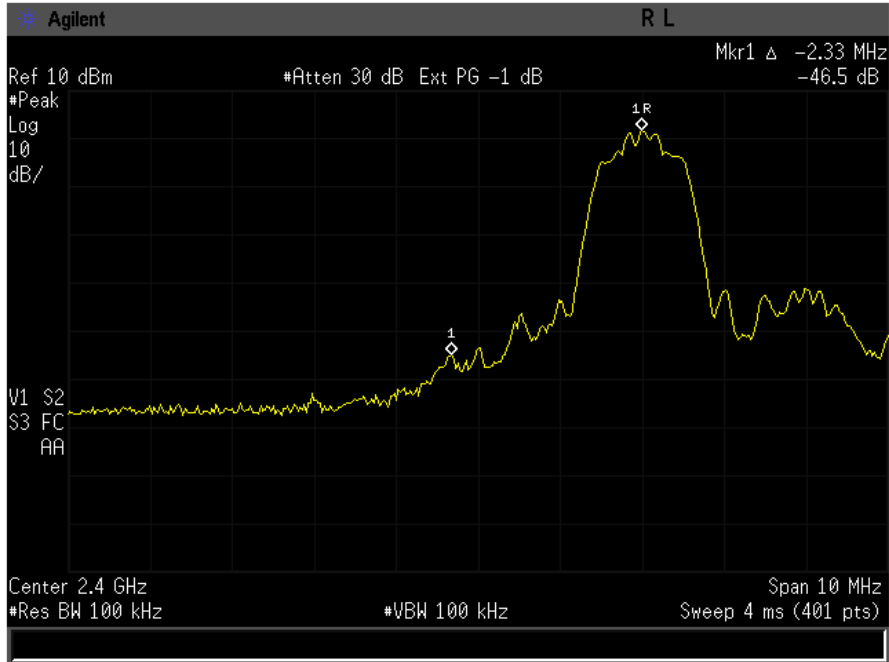
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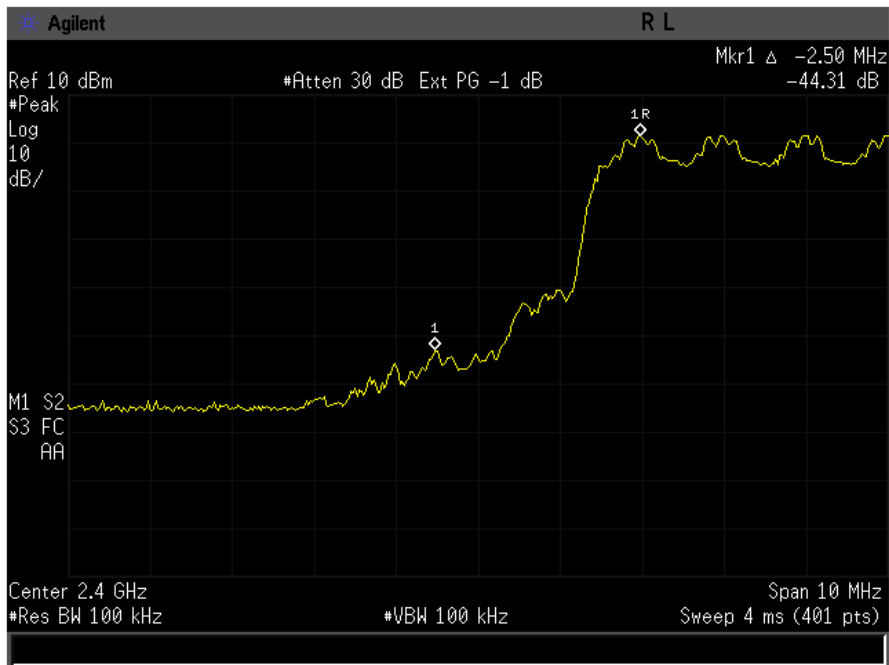
**Figure 10-2a: EDR DQPSK Low band edge with hopping disabled.**



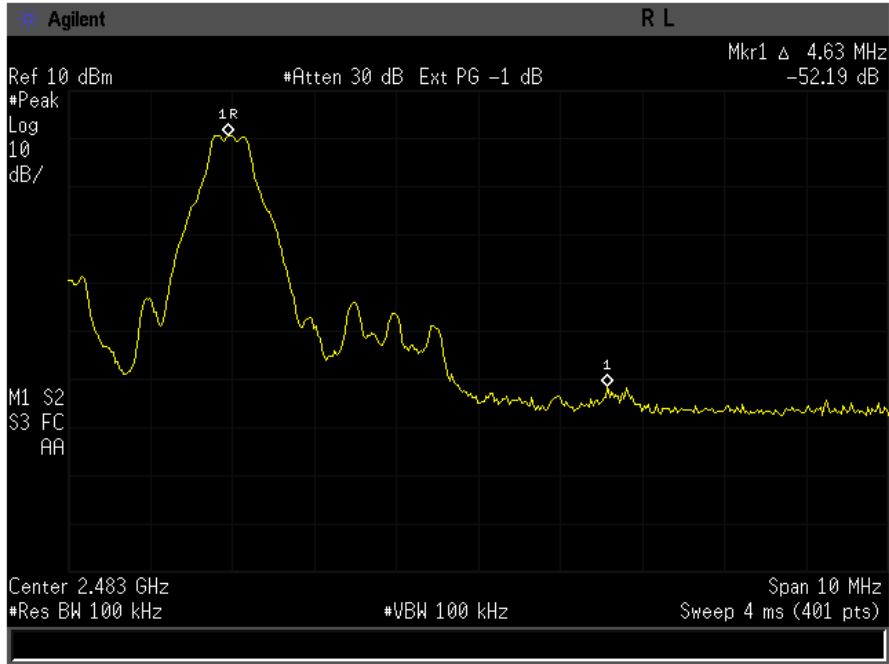
**Figure 10-2b: EDR DQPSK Low band edge with hopping enabled.**



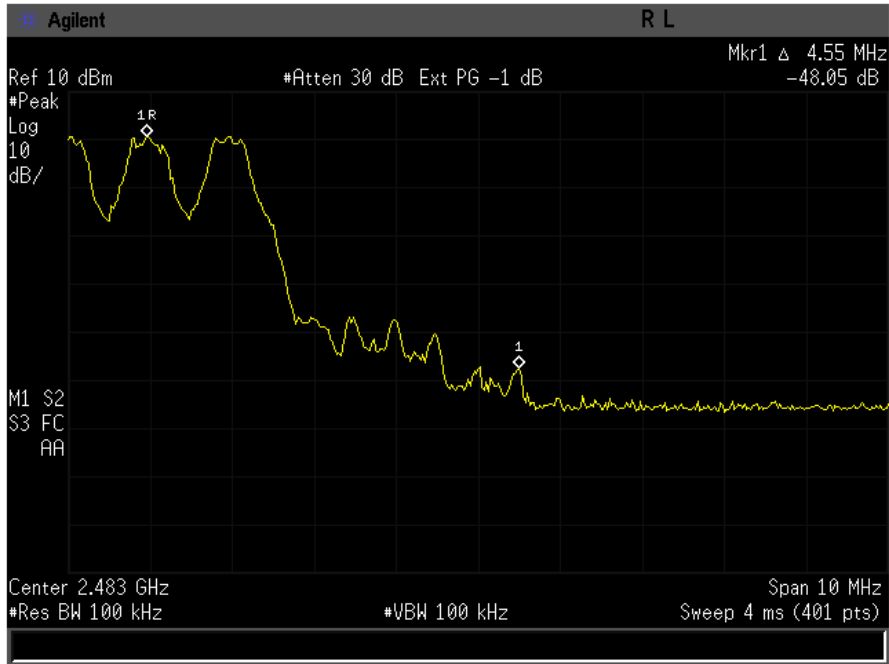
**Figure 10-3a: EDR D8PSK Low band edge with hopping disabled.**



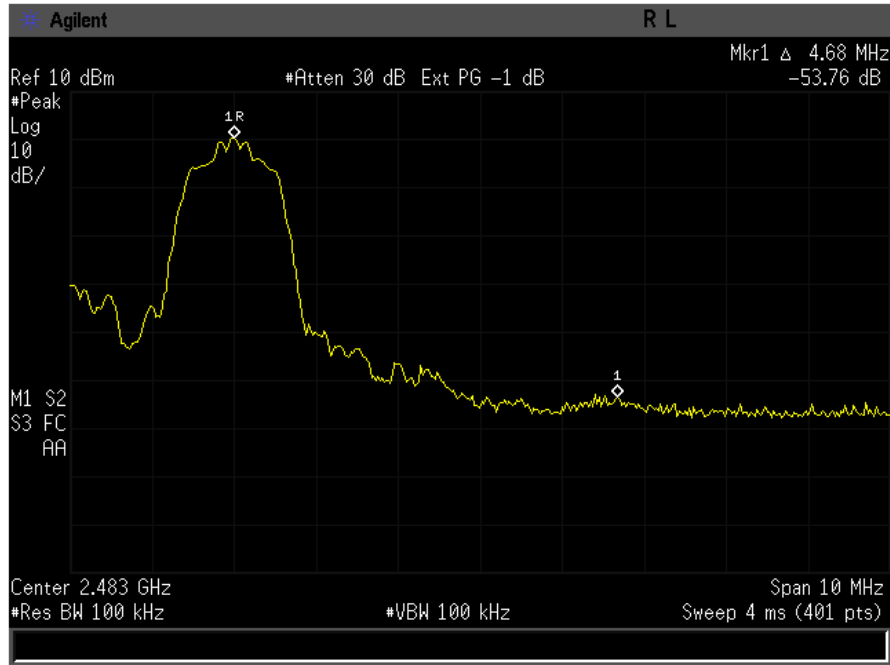
**Figure 10-3b: EDR D8PSK Low band edge with hopping enabled.**



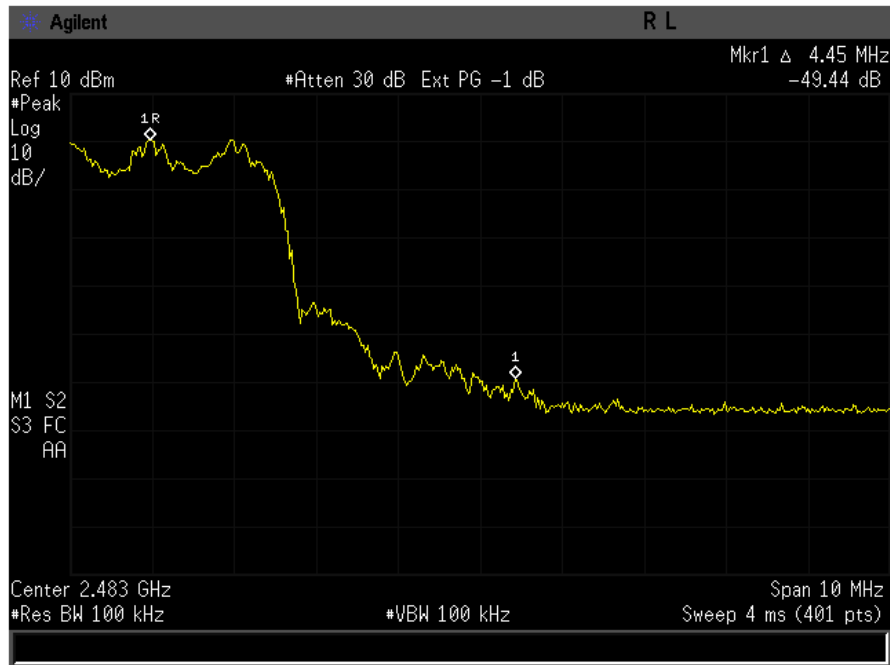
**Figure 10-4a: Basic Rate High band edge with hopping disabled.**



**Figure 10-4b: Basic Rate High band edge with hopping enabled.**



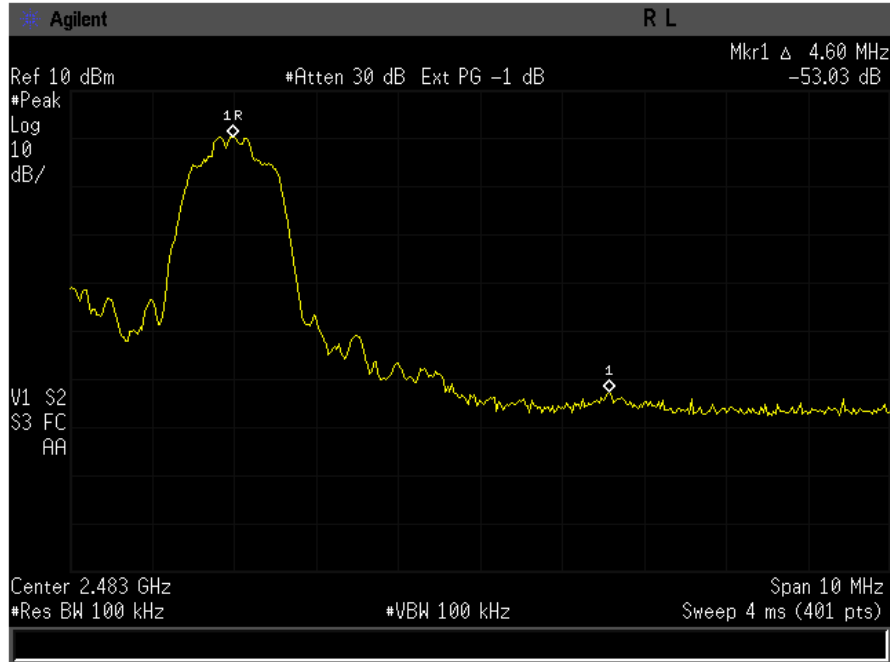
**Figure 10-5a: EDR DQPSK High band edge with hopping disabled.**



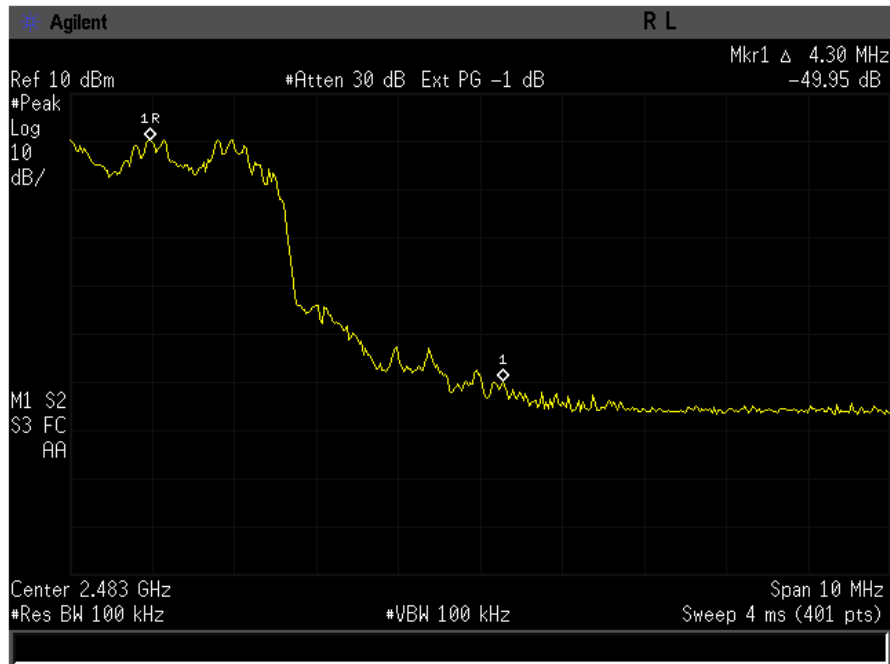
**Figure 10-5b: EDR DQPSK High band edge with hopping enabled.**



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|------------|----------------------|
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**Figure 10-6a: EDR D8PSK High band edge with hopping disabled.**



**Figure 10-6b: EDR D8PSK High band edge with hopping enabled.**

# 11 SPURIOUS RF CONDUCTED EMISSIONS

## 11.1 Test Configuration

|             |                      |
|-------------|----------------------|
| <b>FCC:</b> | <b>§ 15.247 d</b>    |
| <b>IC:</b>  | <b>RSS-210 §A8.5</b> |

The Bluetooth RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low, mid and high channels of Bluetooth transmitter were enabled separately and the frequency spectrum was investigated for any spurious emissions. A fully charged battery was used as supply voltage.

Frequencies of Interest: Spectrum was investigated from 9kHz – 25 GHz.

Limits: <-20 dBc

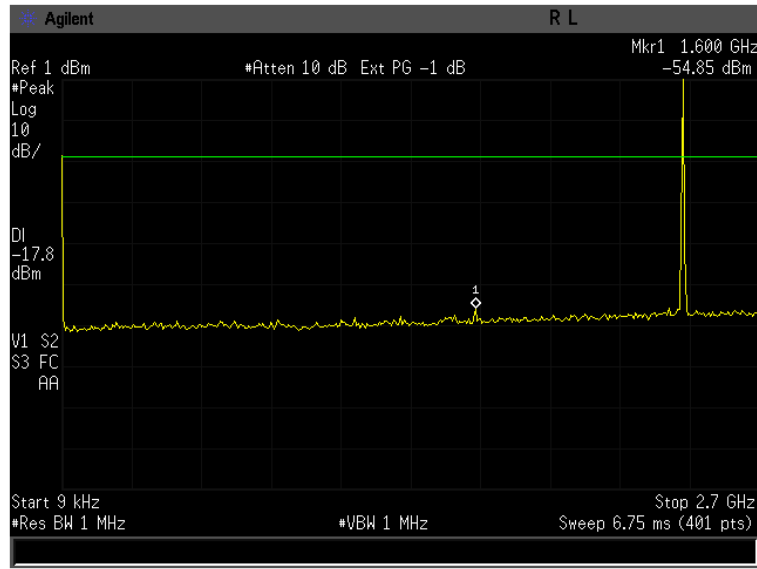
## 11.2 Results: Conducted Spurious Emissions

| Figure | Channel | Plot Description                              | Results    |
|--------|---------|---|------------|
| 11-1a  | 0       | Conducted spurious emissions, 9kHz to 2.7GHz  | -48.08 dBc |
| 11-1b  |         | Conducted spurious emissions, 2.7GHz to 25GHz |            |
| 11-2a  | 39      | Conducted spurious emissions, 9kHz to 2.7GHz  | -46.09 dBc |
| 11-2b  |         | Conducted spurious emissions, 2.7GHz to 25GHz |            |
| 11-3a  | 78      | Conducted spurious emissions, 9kHz to 2.7GHz  | -45.06 dBc |
| 11-3b  |         | Conducted spurious emissions, 2.7GHz to 25GHz |            |

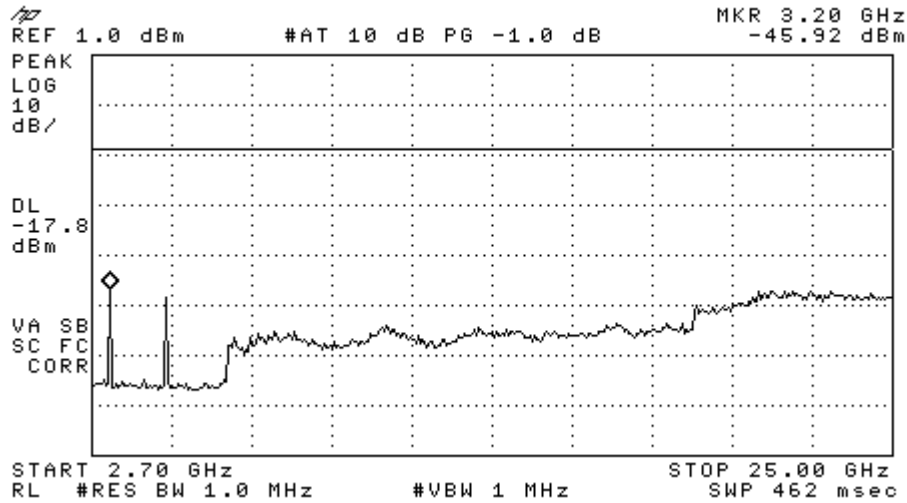
Comments:  
 Spurious RF Conducted Emission testing was performed on the modulation that has the highest conducted power in comparison with the other modulation.



|            |                      |
|------------|----------------------|
| Applicant: | Kyocera              |
| FCC ID:    | V65E4210             |
| Report #:  | CT-E4210-15C-0711-R0 |



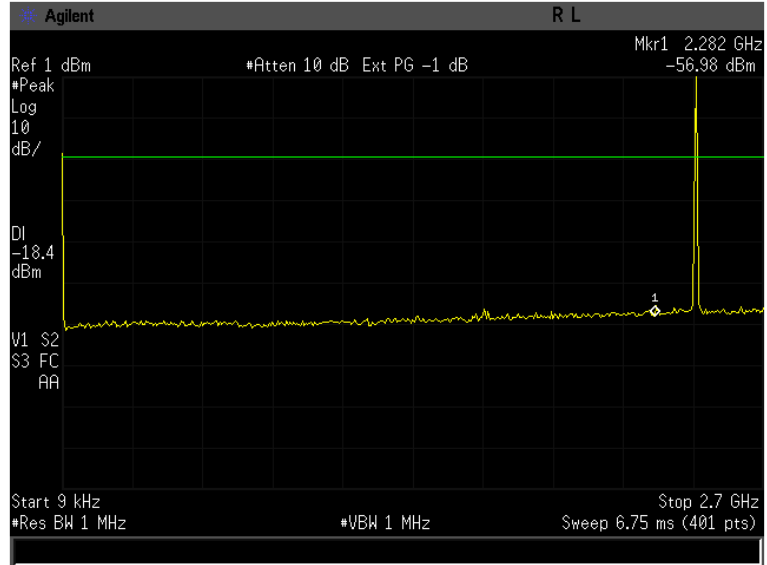
**Figure 11-1a: Conducted Spurious Emissions (CH 0).**



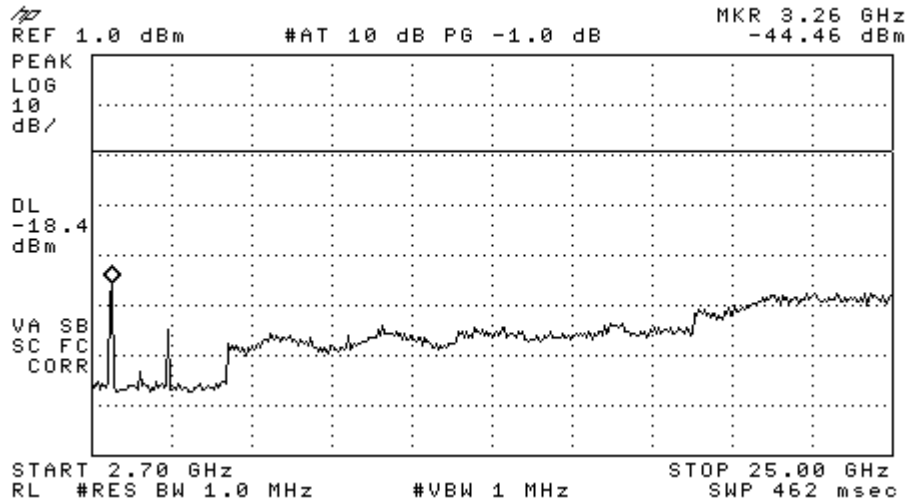
**Figure 11-1b: Conducted Spurious Emissions (CH 0).**



|            |                      |
|------------|----------------------|
| Applicant: | Kyocera              |
| FCC ID:    | V65E4210             |
| Report #:  | CT-E4210-15C-0711-R0 |



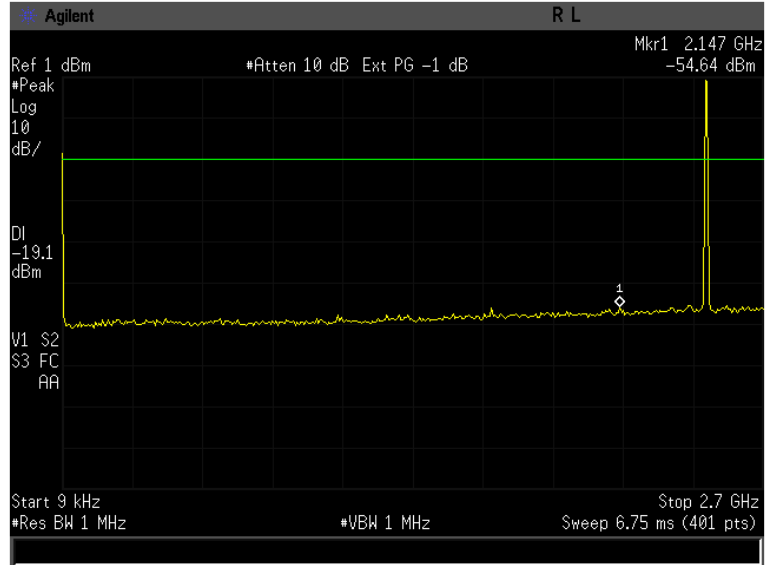
**Figure 11-2a: Conducted Spurious Emissions (CH 39).**



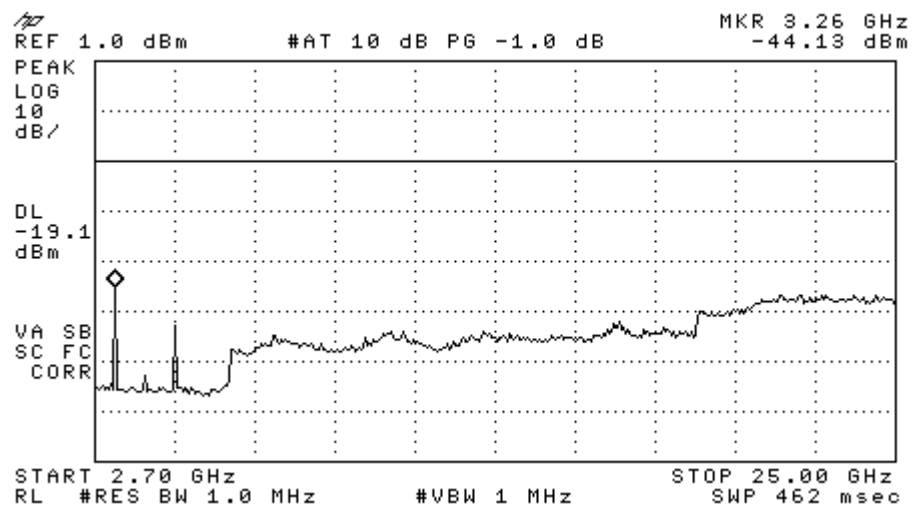
**Figure 11-2b: Conducted Spurious Emissions (CH 39).**



|            |                      |
|------------|----------------------|
| Applicant: | Kyocera              |
| FCC ID:    | V65E4210             |
| Report #:  | CT-E4210-15C-0711-R0 |



**Figure 11-3a: Conducted Spurious Emissions (CH 78).**



**Figure 11-3b: Conducted Spurious Emissions (CH 78).**

## 12 AC POWER LINE CONDUCTED EMISSIONS

### 12.1 Test Configuration & Results

|                     |                   |
|---------------------|-------------------|
| <b>FCC:</b>         | § 15.107 § 15.207 |
| <b>IC:</b>          | RSS-210 §6.6      |
| See separate report |                   |

## 13 RADIATED EMISSIONS

### 13.1 Test Configuration & Results

|                     |                   |
|---------------------|-------------------|
| <b>FCC:</b>         | § 15.109 § 15.209 |
| <b>IC:</b>          | RSS-210 §A2.9 (2) |
| See separate report |                   |

## 14 TEST EQUIPMENT

The test equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

| Description       | Manufacturer    | Model No. | Serial No. | Cal Due Date |
|-------------------|-----------------|-----------|------------|--------------|
| Spectrum Analyzer | Hewlett Packard | 8593EM    | 3710A00203 | 06/09/12     |
| Spectrum Analyzer | Agilent         | E4405B    | US41441217 | 05/26/12     |