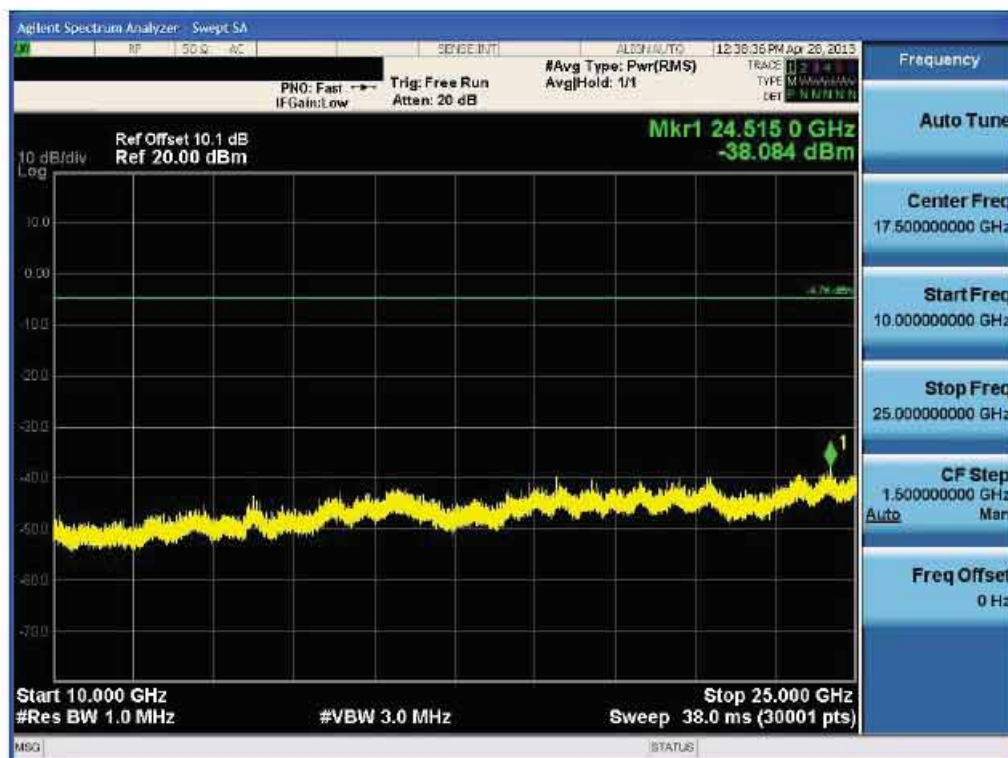


10 GHz ~ 25 GHz

### Conducted Spurious Emission (802.11b-CH1)



### Conducted Spurious Emission (802.11b-CH6)



|                                   |                                |                                                                  |                                                  |
|-----------------------------------|--------------------------------|------------------------------------------------------------------|--------------------------------------------------|
| FCC PT.15.247<br>TEST REPORT      | FCC CERTIFICATION REPORT       |                                                                  | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1305FR11-1 | Date of Issue:<br>May 23, 2013 | EUT Type:<br>GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n | FCC ID:<br>ZNFE440J                              |



### Conducted Spurious Emission (802.11g-CH6)



### Conducted Spurious Emission (802.11g-CH11)



|                                   |                                |                                                                  |                     |                                                  |
|-----------------------------------|--------------------------------|------------------------------------------------------------------|---------------------|--------------------------------------------------|
| FCC PT.15.247<br>TEST REPORT      | FCC CERTIFICATION REPORT       |                                                                  |                     | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1305FR11-1 | Date of Issue:<br>May 23, 2013 | EUT Type:<br>GSM/WCDMA Phone with Bluetooth3.0, WiFi802.11 b/g/n | FCC ID:<br>ZNFE440J |                                                  |

## Conducted Spurious Emission (802.11n-CH1) \_20 MHz BW



## Conducted Spurious Emission (802.11n-CH6) \_20 MHz BW



### Conducted Spurious Emission (802.11n-CH11) \_20 MHz BW



### Conducted Spurious Emission (802.11n-CH3) \_40 MHz BW



|                                   |                                |                                                                  |                     |                                                  |
|-----------------------------------|--------------------------------|------------------------------------------------------------------|---------------------|--------------------------------------------------|
| FCC PT.15.247<br>TEST REPORT      | FCC CERTIFICATION REPORT       |                                                                  |                     | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1305FR11-1 | Date of Issue:<br>May 23, 2013 | EUT Type:<br>GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n | FCC ID:<br>ZNFE440J |                                                  |

### Conducted Spurious Emission (802.11n-CH6) \_40 MHz BW



### Conducted Spurious Emission (802.11n-CH9) \_40 MHz BW



|                                   |                                |                                                                  |                     |                                                  |
|-----------------------------------|--------------------------------|------------------------------------------------------------------|---------------------|--------------------------------------------------|
| FCC PT.15.247<br>TEST REPORT      | FCC CERTIFICATION REPORT       |                                                                  |                     | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCTR1305FR11-1 | Date of Issue:<br>May 23, 2013 | EUT Type:<br>GSM/WCDMA Phone with Bluetooth3.0, WiFi802.11 b/g/n | FCC ID:<br>ZNFE440J |                                                  |

## 8.5 RADIATED MEASUREMENT.

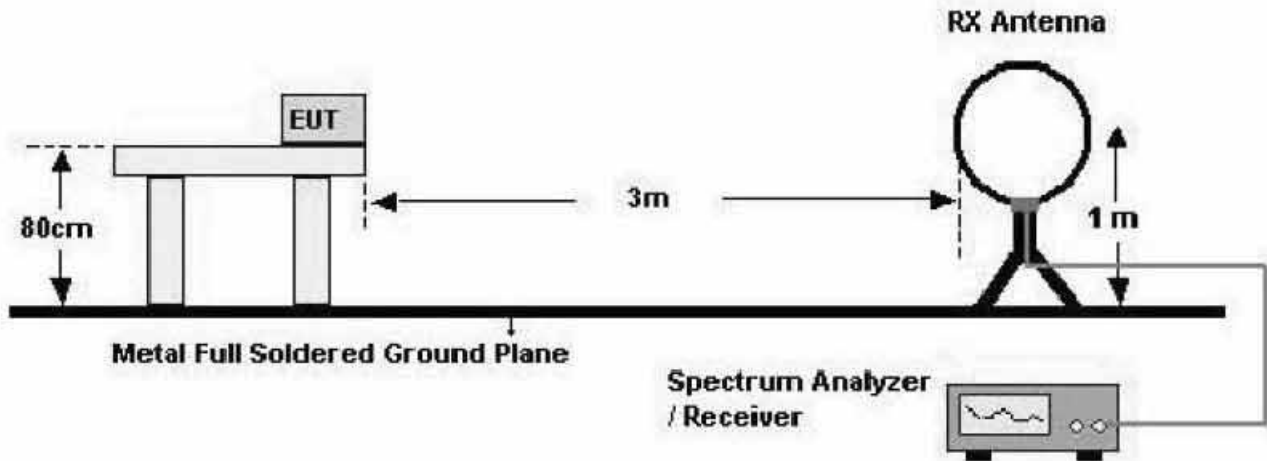
### 8.5.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

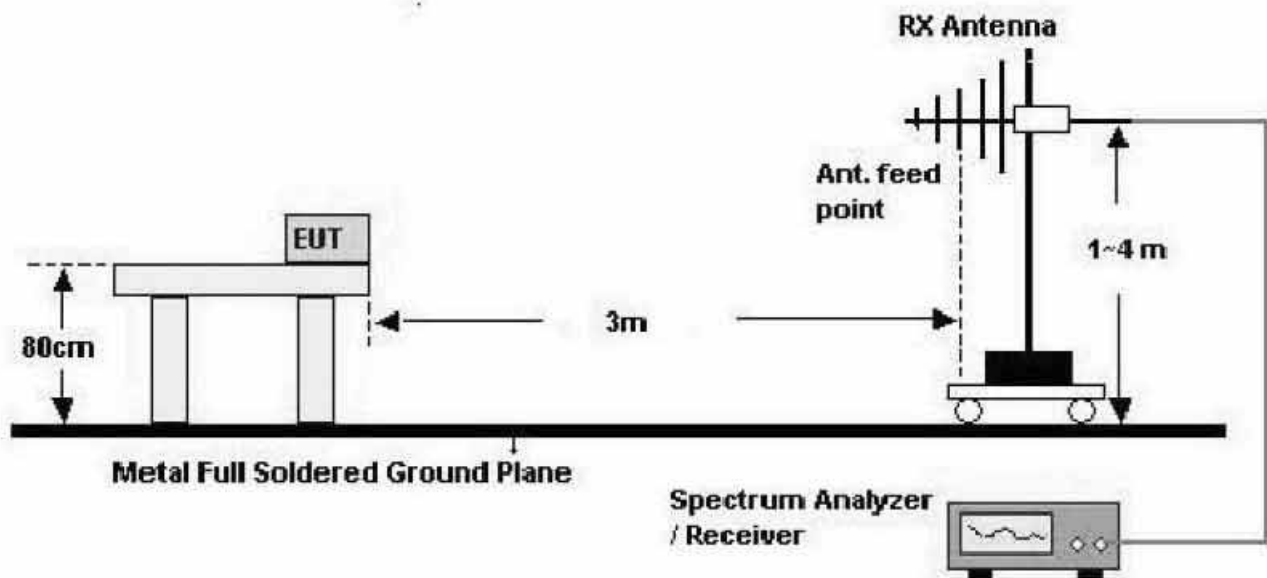
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 – 0.490   | 2400/F (kHz)          | 300                      |
| 0.490 – 1.705   | 24000/F (kHz)         | 30                       |
| 1.705 – 30      | 30                    | 30                       |
| 30-88           | 100                   | 3                        |
| 88-216          | 150                   | 3                        |
| 216-960         | 200                   | 3                        |
| Above 960       | 500                   | 3                        |

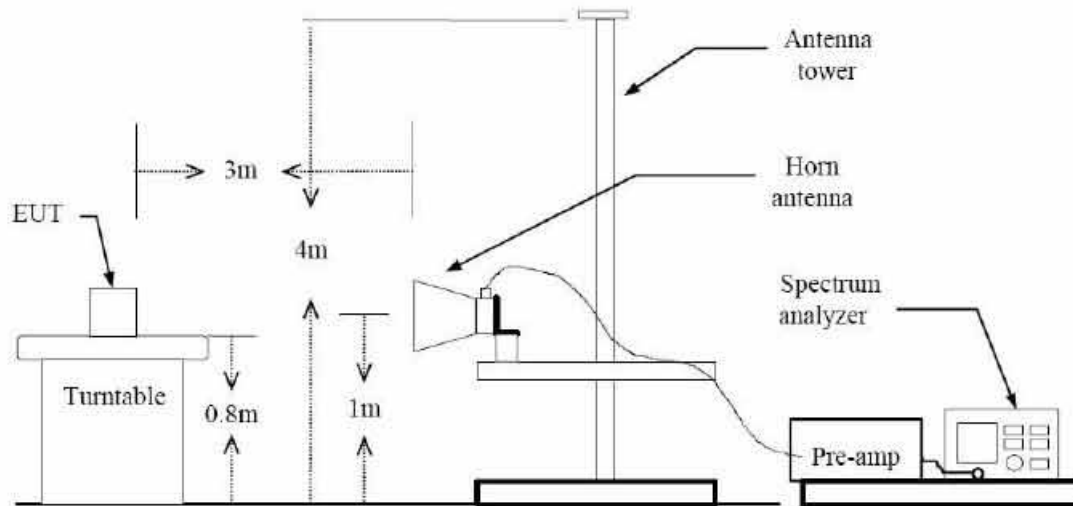
## Test Configuration

### Below 30 MHz



### 30 MHz - 1 GHz





## TEST PROCEDURE USED

ANSI C63.10(2009)

Method 12.2.4 in KDB 558074, issued 04/09/2013 (Peak)

Method 12.2.5.1 in KDB 558074, issued 04/09/2013(Average Case 1)

Method 12.2.5.3 in KDB 558074, issued 04/09/2013(Average Case 2)

## Spectrum Setting

### - Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW  $\geq 3 \times$  RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

**Table 1 —RBW as a function of frequency**

| Frequency   | RBW         |
|-------------|-------------|
| 9-150 kHz   | 200-300 Hz  |
| 0.15-30 MHz | 9-10 kHz    |
| 30-1000 MHz | 100-120 kHz |
| > 1000 MHz  | 1 MHz       |

- Average

#### Case 1

If the EUT can be configured or modified to transmit continuously (duty cycle  $\geq$  98 percent then the average emission levels shall be measured using the following method (with EUT transmitting continuously).

RBW = 1 MHz (unless otherwise specified).

VBW  $\geq 3 \times$  RBW.

Detector = RMS, if span/(# of points in sweep)  $\leq$  (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

Averaging type = power (i.e., RMS).

- 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
- 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

Sweep time = auto.

Perform a trace average of at least 100 traces.

#### Case 2

If continuous transmission of the EUT (i.e., duty cycle  $\geq$  98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed  $\pm$  2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW  $\geq 1/T$ .

Video bandwidth mode or display mode

- 1) The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).
- 2) As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 times (1/duty cycle) traces.

|                                          |                                       |                                                                         |                                                  |
|------------------------------------------|---------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------|
| <b>FCC PT.15.247<br/>TEST REPORT</b>     | <b>FCC CERTIFICATION REPORT</b>       |                                                                         | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCTR1305FR11-1 | <b>Date of Issue:</b><br>May 23, 2013 | <b>EUT Type:</b><br>GSM/WCDMA Phone with Bluetooth3.0, WiFi802.11 b/g/n | <b>FCC ID:</b><br>ZNFE440J                       |

## TEST RESULTS

**9 kHz – 30MHz**

**Operation Mode:** Normal Mode

| Frequency               | Reading    | Ant. factor | Cable loss | Ant. POL | Total        | Limit        | Margin |
|-------------------------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz                     | dB $\mu$ V | dB /m       | dB         | (H/V)    | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| No Critical peaks found |            |             |            |          |              |              |        |

### Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## TEST RESULTS

**Below 1 GHz**

**Operation Mode:** Normal Mode

| Frequency               | Reading    | Ant. factor | Cable loss | Ant. POL | Total        | Limit        | Margin |
|-------------------------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz                     | dB $\mu$ V | dB /m       | dB         | (H/V)    | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| No Critical peaks found |            |             |            |          |              |              |        |

### Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## Above 1 GHz

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 b |
| Transfer Rate:      | 1 Mbps   |
| Operating Frequency | 2412     |
| Channel No.         | 01 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 54.02           | -0.79                | V                 | 53.23             | 74                | 20.77          | PK     |
| 4824               | 46.76           | -0.79                | V                 | 45.97             | 54                | 8.03           | AV     |
| 7236               | 49.84           | 9.08                 | V                 | 58.92             | 74                | 15.08          | PK     |
| 7236               | 37.80           | 9.08                 | V                 | 46.88             | 54                | 7.12           | AV     |
| 4824               | 54.01           | -0.79                | H                 | 53.22             | 74                | 20.78          | PK     |
| 4824               | 45.70           | -0.79                | H                 | 44.91             | 54                | 9.09           | AV     |

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 g |
| Transfer Rate:      | 54 Mbps  |
| Operating Frequency | 2412     |
| Channel No.         | 01 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 52.02           | -0.79                | V                 | 51.23             | 74                | 22.77          | PK     |
| 4824               | 39.39           | -0.79                | V                 | 38.6              | 54                | 15.40          | AV     |
| 7236               | 49.41           | 9.08                 | V                 | 58.49             | 74                | 15.51          | PK     |
| 7236               | 37.53           | 9.08                 | V                 | 46.61             | 54                | 7.39           | AV     |
| 4824               | 51.44           | -0.79                | H                 | 50.65             | 74                | 23.35          | PK     |
| 4824               | 39.45           | -0.79                | H                 | 38.66             | 54                | 15.34          | AV     |
| 7236               | 49.50           | 9.08                 | H                 | 58.58             | 74                | 15.42          | PK     |
| 7236               | 37.41           | 9.08                 | H                 | 46.49             | 54                | 7.51           | AV     |

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 n |
| Transfer Rate:      | 65 Mbps  |
| Operating Frequency | 2412     |
| Channel No.         | 01 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4824               | 51.33           | -0.79                | V                 | 50.54             | 74                | 23.46          | PK     |
| 4824               | 39.80           | -0.79                | V                 | 39.01             | 54                | 14.99          | AV     |
| 7236               | 49.70           | 9.08                 | V                 | 58.78             | 74                | 15.22          | PK     |
| 7236               | 38.48           | 9.08                 | V                 | 47.56             | 54                | 6.44           | AV     |
| 4824               | 51.40           | -0.79                | H                 | 50.61             | 74                | 23.39          | PK     |
| 4824               | 39.48           | -0.79                | H                 | 38.69             | 54                | 15.31          | AV     |
| 7236               | 49.48           | 9.08                 | H                 | 58.56             | 74                | 15.44          | PK     |
| 7236               | 38.52           | 9.08                 | H                 | 47.6              | 54                | 6.40           | AV     |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate of 802.11b/g/n is 1 Mbps/54 Mbps/65 Mbps of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

**Operation Mode:** 802.11 b  
**Transfer Rate:** 1 Mbps  
**Operating Frequency** 2437  
**Channel No.** 06 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 54.83           | -0.37                | V                 | 54.46             | 74                | 19.54          | PK     |
| 4874               | 48.36           | -0.37                | V                 | 47.99             | 54                | 6.01           | AV     |
| 7311               | 49.04           | 8.64                 | V                 | 57.68             | 74                | 16.32          | PK     |
| 7311               | 37.61           | 8.64                 | V                 | 46.25             | 54                | 7.75           | AV     |
| 4874               | 53.63           | -0.37                | H                 | 53.26             | 74                | 20.74          | PK     |
| 4874               | 45.33           | -0.37                | H                 | 44.96             | 54                | 9.04           | AV     |
| 7311               | 48.89           | 8.64                 | H                 | 57.53             | 74                | 16.47          | PK     |
| 7311               | 37.52           | 8.64                 | H                 | 46.16             | 54                | 7.84           | AV     |

**Operation Mode:** 802.11 g  
**Transfer Rate:** 54 Mbps  
**Operating Frequency** 2437  
**Channel No.** 06 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 50.95           | -0.37                | V                 | 50.58             | 74                | 23.42          | PK     |
| 4874               | 39.35           | -0.37                | V                 | 38.98             | 54                | 15.02          | AV     |
| 7311               | 48.95           | 8.64                 | V                 | 57.59             | 74                | 16.41          | PK     |
| 7311               | 37.73           | 8.64                 | V                 | 46.37             | 54                | 7.63           | AV     |
| 4874               | 50.66           | -0.37                | H                 | 50.29             | 74                | 23.71          | PK     |
| 4874               | 39.14           | -0.37                | H                 | 38.77             | 54                | 15.23          | AV     |
| 7311               | 48.91           | 8.64                 | H                 | 57.55             | 74                | 16.45          | PK     |
| 7311               | 37.64           | 8.64                 | H                 | 46.28             | 54                | 7.72           | AV     |

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 n |
| Transfer Rate:      | 65 Mbps  |
| Operating Frequency | 2437     |
| Channel No.         | 06 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 50.64           | -0.37                | V                 | 50.27             | 74                | 23.73          | PK     |
| 4874               | 39.34           | -0.37                | V                 | 38.97             | 54                | 15.03          | AV     |
| 7311               | 48.75           | 8.64                 | V                 | 57.39             | 74                | 16.61          | PK     |
| 7311               | 37.68           | 8.64                 | V                 | 46.32             | 54                | 7.68           | AV     |
| 4874               | 50.84           | -0.37                | H                 | 50.47             | 74                | 23.53          | PK     |
| 4874               | 39.26           | -0.37                | H                 | 38.89             | 54                | 15.11          | AV     |
| 7311               | 48.81           | 8.64                 | H                 | 57.45             | 74                | 16.55          | PK     |
| 7311               | 37.61           | 8.64                 | H                 | 46.25             | 54                | 7.75           | AV     |

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate of 802.11b/g/n is 1 Mbps/54 Mbps/65 Mbps of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

**Operation Mode:** 802.11 b  
**Transfer Rate:** 1 Mbps  
**Operating Frequency** 2462  
**Channel No.** 11 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 54.83           | -0.15                | V                 | 54.68             | 74                | 19.32          | PK     |
| 4924               | 48.43           | -0.15                | V                 | 48.28             | 54                | 5.72           | AV     |
| 7386               | 49.56           | 9.06                 | V                 | 58.62             | 74                | 15.38          | PK     |
| 7386               | 37.85           | 9.06                 | V                 | 46.91             | 54                | 7.09           | AV     |
| 4924               | 53.36           | -0.15                | H                 | 53.21             | 74                | 20.79          | PK     |
| 4924               | 45.52           | -0.15                | H                 | 45.37             | 54                | 8.63           | AV     |
| 7386               | 49.15           | 9.06                 | H                 | 58.21             | 74                | 15.79          | PK     |
| 7386               | 37.67           | 9.06                 | H                 | 46.73             | 54                | 7.27           | AV     |

**Operation Mode:** 802.11 g  
**Transfer Rate:** 54 Mbps  
**Operating Frequency** 2462  
**Channel No.** 11 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 50.42           | -0.15                | V                 | 50.27             | 74                | 23.73          | PK     |
| 4924               | 38.89           | -0.15                | V                 | 38.74             | 54                | 15.26          | AV     |
| 7386               | 49.83           | 9.06                 | V                 | 58.89             | 74                | 15.11          | PK     |
| 7386               | 38.02           | 9.06                 | V                 | 47.08             | 54                | 6.92           | AV     |
| 4924               | 50.36           | -0.15                | H                 | 50.21             | 74                | 23.79          | PK     |
| 4924               | 38.77           | -0.15                | H                 | 38.62             | 54                | 15.38          | AV     |
| 7386               | 49.76           | 9.06                 | H                 | 58.82             | 74                | 15.18          | PK     |
| 7386               | 38.04           | 9.06                 | H                 | 47.1              | 54                | 6.9            | AV     |

|                     |          |
|---------------------|----------|
| Operation Mode:     | 802.11 n |
| Transfer Rate:      | 65 Mbps  |
| Operating Frequency | 2462     |
| Channel No.         | 11 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4924               | 50.34           | -0.15                | V                 | 50.19             | 74                | 23.81          | PK     |
| 4924               | 38.84           | -0.15                | V                 | 38.69             | 54                | 15.31          | AV     |
| 7386               | 49.91           | 9.06                 | V                 | 58.97             | 74                | 15.03          | PK     |
| 7386               | 38.00           | 9.06                 | V                 | 47.06             | 54                | 6.94           | AV     |
| 4924               | 50.26           | -0.15                | H                 | 50.11             | 74                | 23.89          | PK     |
| 4924               | 38.77           | -0.15                | H                 | 38.62             | 54                | 15.38          | AV     |
| 7386               | 49.80           | 9.06                 | H                 | 58.86             | 74                | 15.14          | PK     |
| 7386               | 37.97           | 9.06                 | H                 | 47.03             | 54                | 6.97           | AV     |

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done 802.11b/g/n mode and all data rate. Worst data rate of 802.11b/g/n is 1 Mbps/54 Mbps/65 Mbps of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11 n_40 MHz BW |
| Transfer Rate:      | 135 Mbps           |
| Operating Frequency | 2422               |
| Channel No.         | 03 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4844               | 51.84           | -0.72                | V                 | 51.12             | 74                | 22.88          | PK     |
| 4844               | 39.14           | -0.72                | V                 | 38.42             | 54                | 15.58          | AV     |
| 7266               | 49.38           | 9.95                 | V                 | 59.33             | 74                | 14.67          | PK     |
| 7266               | 37.43           | 9.95                 | V                 | 47.38             | 54                | 6.62           | AV     |
| 4844               | 51.51           | -0.72                | H                 | 50.79             | 74                | 23.21          | PK     |
| 4844               | 39.22           | -0.72                | H                 | 38.50             | 54                | 15.50          | AV     |
| 7266               | 49.45           | 9.95                 | H                 | 59.40             | 74                | 14.60          | PK     |
| 7266               | 37.28           | 9.95                 | H                 | 47.23             | 54                | 6.77           | AV     |

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_40 MHz BW. Worst case of EUT is 135 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Operation Mode: 802.11 n\_40 MHz BW

Transfer Rate: 135 Mbps

Operating Frequency: 2437

Channel No.: 06 Ch

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4874               | 50.75           | -0.37                | V                 | 50.38             | 74                | 23.62          | PK     |
| 4874               | 39.26           | -0.37                | V                 | 38.89             | 54                | 15.11          | AV     |
| 7311               | 48.84           | 8.64                 | V                 | 57.48             | 74                | 16.52          | PK     |
| 7311               | 37.71           | 8.64                 | V                 | 46.35             | 54                | 7.65           | AV     |
| 4874               | 50.83           | -0.37                | H                 | 50.46             | 74                | 23.54          | PK     |
| 4874               | 39.38           | -0.37                | H                 | 39.01             | 54                | 14.99          | AV     |
| 7311               | 48.75           | 8.64                 | H                 | 57.39             | 74                | 16.61          | PK     |
| 7311               | 37.61           | 8.64                 | H                 | 46.25             | 54                | 7.75           | AV     |

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_40 MHz BW. Worst case of EUT is 135 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11 n_40 MHz BW |
| Transfer Rate:      | 135 Mbps           |
| Operating Frequency | 2452               |
| Channel No.         | 09 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-AMP G<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4904               | 50.16           | -0.10                | V                 | 50.06             | 74                | 23.94          | PK     |
| 4904               | 38.81           | -0.10                | V                 | 38.71             | 54                | 15.29          | AV     |
| 7356               | 49.73           | 9.00                 | V                 | 58.73             | 74                | 15.27          | PK     |
| 7356               | 38.10           | 9.00                 | V                 | 47.10             | 54                | 6.90           | AV     |
| 4904               | 50.18           | -0.10                | H                 | 50.08             | 74                | 23.92          | PK     |
| 4904               | 38.67           | -0.10                | H                 | 38.57             | 54                | 15.43          | AV     |
| 7356               | 49.94           | 9.00                 | H                 | 58.94             | 74                | 15.06          | PK     |
| 7356               | 38.08           | 9.00                 | H                 | 47.08             | 54                | 6.92           | AV     |

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_40 MHz BW. Worst case of EUT is 135 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## 8.5.2 RADIATED RESTRICTED BAND EDGES

### Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11g            |
| Transfer Rate:      | 36 Mbps            |
| Operating Frequency | 2412 MHz, 2462 MHz |
| Channel No.         | 01 Ch, 11 Ch       |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------|-------------------|-------------------|-------------------|----------------|--------|
| 2390.0             | 28.64           | 33.90          | H                 | 62.54             | 74                | 11.46          | PK     |
| 2390.0             | 16.53           | 33.90          | H                 | 50.43             | 54                | 3.57           | AV     |
| 2390.0             | 28.87           | 33.90          | V                 | 62.77             | 74                | 11.23          | PK     |
| 2390.0             | 16.69           | 33.90          | V                 | 50.59             | 54                | 3.41           | AV     |
| 2483.5             | 28.07           | 33.99          | H                 | 62.06             | 74                | 11.94          | PK     |
| 2483.5             | 15.41           | 33.99          | H                 | 49.40             | 54                | 4.60           | AV     |
| 2483.5             | 27.59           | 33.99          | V                 | 61.58             | 74                | 12.42          | PK     |
| 2483.5             | 15.27           | 33.99          | V                 | 49.26             | 54                | 4.74           | AV     |

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11b            |
| Transfer Rate:      | 1 Mbps             |
| Operating Frequency | 2412 MHz, 2462 MHz |
| Channel No.         | 01 Ch, 11 Ch       |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------|-------------------|-------------------|-------------------|----------------|--------|
| 2390.0             | 27.41           | 33.90          | H                 | 61.31             | 74                | 12.69          | PK     |
| 2390.0             | 15.65           | 33.90          | H                 | 49.55             | 54                | 4.45           | AV     |
| 2390.0             | 27.15           | 33.90          | V                 | 61.05             | 74                | 12.95          | PK     |
| 2390.0             | 16.89           | 33.90          | V                 | 50.79             | 54                | 3.21           | AV     |
| 2483.5             | 26.70           | 33.99          | H                 | 60.69             | 74                | 13.31          | PK     |
| 2483.5             | 15.20           | 33.99          | H                 | 49.19             | 54                | 4.81           | AV     |
| 2483.5             | 25.51           | 33.99          | V                 | 59.50             | 74                | 14.50          | PK     |
| 2483.5             | 14.65           | 33.99          | V                 | 48.64             | 54                | 5.36           | AV     |

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11n_20 MHz     |
| Transfer Rate:      | 39 Mbps            |
| Operating Frequency | 2412 MHz, 2462 MHz |
| Channel No.         | 01 Ch, 11 Ch       |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------|-------------------|-------------------|-------------------|----------------|--------|
| 2390.0             | 29.75           | 33.90          | H                 | 63.65             | 74                | 10.35          | PK     |
| 2390.0             | 16.98           | 33.90          | H                 | 50.88             | 54                | 3.12           | AV     |
| 2390.0             | 28.99           | 33.90          | V                 | 62.89             | 74                | 11.11          | PK     |
| 2390.0             | 16.91           | 33.90          | V                 | 50.81             | 54                | 3.19           | AV     |
| 2483.5             | 26.45           | 33.99          | H                 | 60.44             | 74                | 13.56          | PK     |
| 2483.5             | 15.46           | 33.99          | H                 | 49.45             | 54                | 4.55           | AV     |
| 2483.5             | 25.91           | 33.99          | V                 | 59.90             | 74                | 14.10          | PK     |
| 2483.5             | 14.65           | 33.99          | V                 | 48.64             | 54                | 5.36           | AV     |

|                     |                    |
|---------------------|--------------------|
| Operation Mode:     | 802.11n_40 MHz     |
| Transfer Rate:      | 81 Mbps            |
| Operating Frequency | 2422 MHz, 2452 MHz |
| Channel No.         | 03 Ch, 09 Ch       |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|----------------|-------------------|-------------------|-------------------|----------------|--------|
| 2390.0             | 28.37           | 33.90          | H                 | 62.27             | 74                | 11.73          | PK     |
| 2390.0             | 16.68           | 33.90          | H                 | 50.58             | 54                | 3.42           | AV     |
| 2390.0             | 27.87           | 33.90          | V                 | 61.77             | 74                | 12.23          | PK     |
| 2390.0             | 16.93           | 33.90          | V                 | 50.83             | 54                | 3.17           | AV     |
| 2483.5             | 27.60           | 33.99          | H                 | 61.59             | 74                | 12.41          | PK     |
| 2483.5             | 16.84           | 33.99          | H                 | 50.83             | 54                | 3.17           | AV     |
| 2483.5             | 27.80           | 33.99          | V                 | 61.79             | 74                | 12.21          | PK     |
| 2483.5             | 16.69           | 33.99          | V                 | 50.68             | 54                | 3.32           | AV     |

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss
2. We have done 802.11b/g/n\_20 MHz BW/n\_40 MHz BW mode and all data rate. Worst data rate of 802.11b/g/n\_20 MHz BW/n\_40 MHz BW mode is 1 Mbps/36 Mbps/39 Mbps/81 Mbps of each mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## 8.6 POWERLINE CONDUCTED EMISSIONS

### Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dBμV) |          |
|-----------------------|---------------|----------|
|                       | Quasi-peak    | Average  |
| 0.15 to 0.50          | 66 to 56      | 56 to 46 |
| 0.50 to 5             | 56            | 46       |
| 5 to 30               | 60            | 50       |

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for 11 Mbps, Ch.6 and 802.11b. Because 802.11b mode is worst case.

■ **RESULT PLOTS**

**Conducted Emissions (Line 1)**

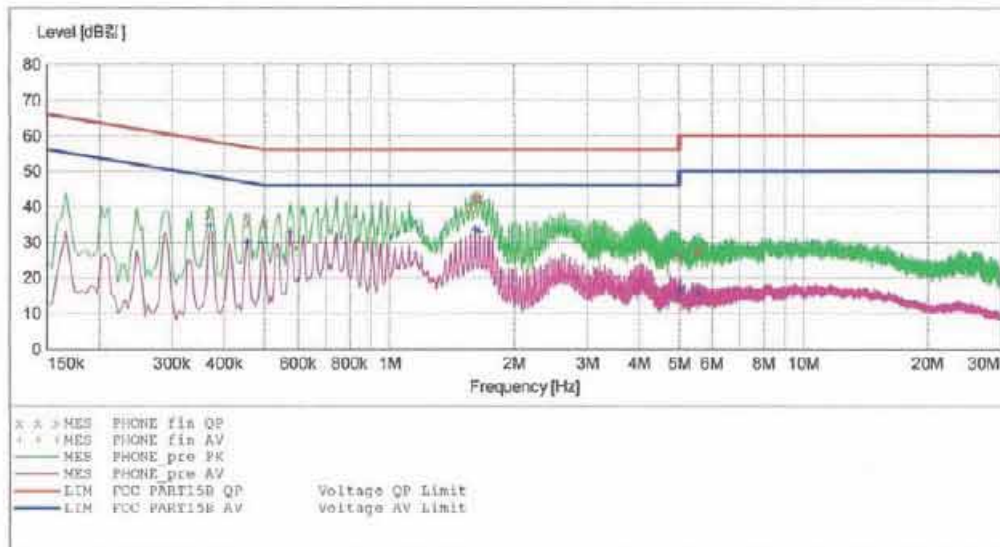
HCT

EMC

EUT: LG-E440J  
Manufacturer: LG  
Operating Condition: WLAN MODE  
Test Site: SHIELD ROOM  
Operator: JS LEE  
Test Specification: FCC PART15 B  
Comment: H

**SCAN TABLE: "FCC CLASS B(H)"**

| Short Description: |           |         | KN22 CLASS B |            |           |            |  |
|--------------------|-----------|---------|--------------|------------|-----------|------------|--|
| Start              | Stop      | Step    | Detector     | Meas. Time | IF Bandw. | Transducer |  |
| Frequency          | Frequency | Width   |              |            |           |            |  |
| 150.0 kHz          | 500.0 kHz | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |  |
|                    |           |         | Average      |            |           |            |  |
| 500.0 kHz          | 5.0 MHz   | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |  |
|                    |           |         | Average      |            |           |            |  |
| 5.0 MHz            | 30.0 MHz  | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |  |
|                    |           |         | Average      |            |           |            |  |



**MEASUREMENT RESULT: "PHONE\_fin QP"**

2013-05-10 11:21오전

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.366001      | 38.00      | 9.8       | 59         | 20.6      | ---  | --- |
| 0.458001      | 35.70      | 9.8       | 57         | 21.1      | ---  | --- |
| 0.498001      | 35.40      | 9.8       | 56         | 20.7      | ---  | --- |
| 1.572000      | 39.90      | 9.9       | 56         | 16.1      | ---  | --- |
| 1.608000      | 42.50      | 9.9       | 56         | 13.5      | ---  | --- |
| 1.652000      | 42.30      | 9.9       | 56         | 13.7      | ---  | --- |
| 5.000000      | 26.10      | 10.2      | 56         | 29.9      | ---  | --- |
| 5.488000      | 28.10      | 10.2      | 60         | 31.9      | ---  | --- |
| 5.576000      | 27.40      | 10.2      | 60         | 32.6      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

2013-05-10 11:21오전

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.370001         | 34.60         | 9.8          | 49            | 13.9         | ---  | --- |
| 0.454001         | 30.00         | 9.8          | 47            | 16.8         | ---  | --- |
| 0.494001         | 29.80         | 9.8          | 46            | 16.3         | ---  | --- |
| 0.576000         | 32.70         | 9.8          | 46            | 13.3         | ---  | --- |
| 1.608000         | 33.50         | 9.9          | 46            | 12.5         | ---  | --- |
| 1.652000         | 33.00         | 9.9          | 46            | 13.0         | ---  | --- |
| 5.000000         | 15.40         | 10.2         | 46            | 30.6         | ---  | --- |
| 5.036000         | 16.90         | 10.2         | 50            | 33.1         | ---  | --- |
| 5.576000         | 15.90         | 10.2         | 50            | 34.1         | ---  | --- |

## Conducted Emissions (Line 2)

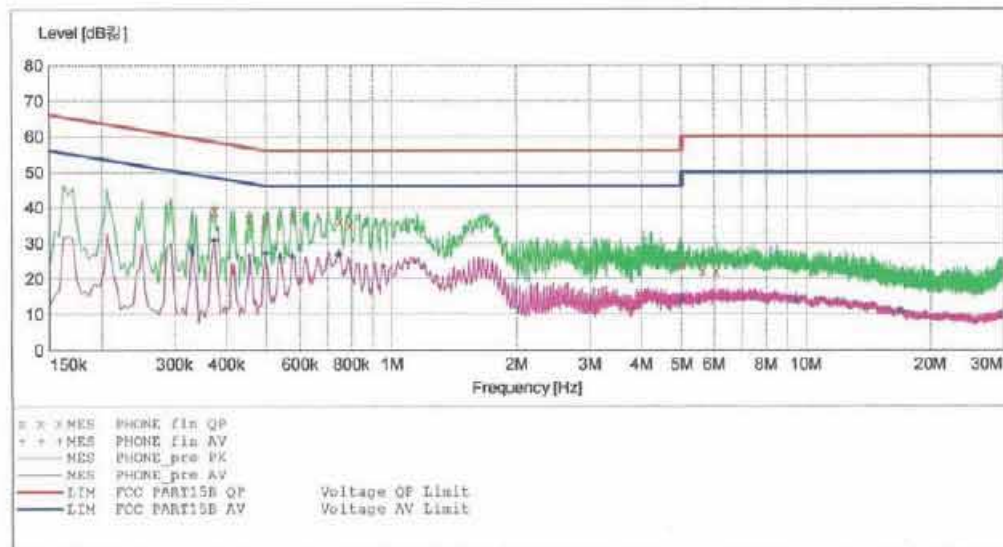
HCT

EMC

EUT: LG-E440j  
Manufacturer: LG  
Operating Condition: WLAN MODE  
Test Site: SHIELD ROOM  
Operator: JS LEE  
Test Specification: FCC PART15 B  
Comment: N

### SCAN TABLE: "FCC CLASS B(N)"

| Short Description: |           |         | KN22 CLASS B |            |           |            |
|--------------------|-----------|---------|--------------|------------|-----------|------------|
| Start              | Stop      | Step    | Detector     | Meas. Time | IF Bandw. | Transducer |
| Frequency          | Frequency | Width   |              |            |           |            |
| 150.0 kHz          | 500.0 kHz | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average      |            |           |            |
| 500.0 kHz          | 5.0 MHz   | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average      |            |           |            |
| 5.0 MHz            | 30.0 MHz  | 4.0 kHz | MaxPeak      | 10.0 ms    | 9 kHz     | None       |
|                    |           |         | Average      |            |           |            |



### MEASUREMENT RESULT: "PHONE\_fin QP"

2013-05-10 11:12오전

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.374001      | 39.00      | 10.0      | 58         | 19.4      | ---  | --- |
| 0.454001      | 37.00      | 10.0      | 57         | 19.8      | ---  | --- |
| 0.498001      | 36.50      | 10.0      | 56         | 19.5      | ---  | --- |
| 0.576000      | 37.30      | 10.0      | 56         | 18.7      | ---  | --- |
| 0.752000      | 36.20      | 10.0      | 56         | 19.8      | ---  | --- |
| 0.792000      | 35.30      | 10.0      | 56         | 20.7      | ---  | --- |
| 5.012000      | 23.90      | 10.4      | 60         | 36.1      | ---  | --- |
| 5.628000      | 22.30      | 10.4      | 60         | 37.7      | ---  | --- |
| 6.076000      | 22.10      | 10.4      | 60         | 37.9      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

2013-05-10 11:12오전

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.330001         | 27.80         | 10.0         | 50            | 21.6         | ---  | --- |
| 0.374001         | 30.80         | 10.0         | 48            | 17.6         | ---  | --- |
| 0.498001         | 27.10         | 10.0         | 46            | 18.9         | ---  | --- |
| 0.540000         | 26.10         | 10.0         | 46            | 19.9         | ---  | --- |
| 0.576000         | 26.30         | 10.0         | 46            | 19.7         | ---  | --- |
| 0.748000         | 26.90         | 10.0         | 46            | 19.1         | ---  | --- |
| 5.000000         | 14.00         | 10.4         | 46            | 32.0         | ---  | --- |
| 9.460000         | 13.70         | 10.7         | 50            | 36.3         | ---  | --- |
| 16.944000        | 10.80         | 11.1         | 50            | 39.2         | ---  | --- |

## 9. LIST OF TEST EQUIPMENT

| Manufacturer          | Model / Equipment                                      | Calibration Interval | Calibration Due | Serial No.         |
|-----------------------|--------------------------------------------------------|----------------------|-----------------|--------------------|
| Rohde & Schwarz       | ENV216/ LISN                                           | Annual               | 02/06/2014      | 100073             |
| Schwarzbeck           | VULB 9160/ TRILOG Antenna                              | Biennial             | 12/17/2014      | 3150               |
| Rohde & Schwarz       | ESI 40 / EMI TEST RECEIVER                             | Annual               | 04/16/2014      | 831564103          |
| Agilent               | E4440A/ Spectrum Analyzer                              | Annual               | 04/25/2014      | US45303008         |
| Agilent               | N9020A/ SIGNAL ANALYZER                                | Annual               | 05/21/2013      | MY51110063         |
| HD                    | MA240/ Antenna Position Tower                          | N/A                  | N/A             | 556                |
| EMCO                  | 1050/ Turn Table                                       | N/A                  | N/A             | 114                |
| HD GmbH               | HD 100/ Controller                                     | N/A                  | N/A             | 13                 |
| HD GmbH               | KMS 560/ SlideBar                                      | N/A                  | N/A             | 12                 |
| Rohde & Schwarz       | SCU-18/ Signal Conditioning Unit                       | Annual               | 09/11/2013      | 10094              |
| MITEQ                 | AMF-6B-180265-35-10P / POWER AMP                       | Annual               | 04/16/2014      | 667624             |
| CERNEX                | CBL26405040 / POWER AMP                                | Annual               | 04/16/2014      | 19660              |
| Schwarzbeck           | BBHA 9120D/ Horn Antenna                               | Biennial             | 10/17/2013      | 937                |
| Schwarzbeck           | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)               | Biennial             | 10/30/2014      | BBHA9170124        |
| Rohde & Schwarz       | FSP / Spectrum Analyzer                                | Annual               | 02/08/2014      | 839117/011         |
| Agilent               | E4416A/Power Meter                                     | Annual               | 11/07/2013      | GB41291412         |
| Agilent               | E9327A/POWER SENSOR                                    | Annual               | 04/16/2014      | MY4442009          |
| Wainwright Instrument | WHF3.0/18G-10EF / High Pass Filter                     | Annual               | 02/08/2014      | F6                 |
| Wainwright Instrument | WHNX6.0/26.5G-6SS / High Pass Filter                   | Annual               | 04/16/2014      | 1                  |
| Wainwright Instrument | WHNX7.0/18G-8SS / High Pass Filter                     | Annual               | 04/16/2014      | 29                 |
| Wainwright Instrument | WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter | Annual               | 03/19/2014      | 1                  |
| Hewlett Packard       | 11636B/Power Divider                                   | Annual               | 11/07/2013      | 11377              |
| Agilent               | 87300B/Directional Coupler                             | Annual               | 12/24/2013      | 3116A03621         |
| Hewlett Packard       | 11667B / Power Splitter                                | Annual               | 06/05/2013      | 05001              |
| DIGITAL               | EP-3010 /DC POWER SUPPLY                               | Annual               | 11/07/2013      | 3110117            |
| ITECH                 | IT6720 / DC POWER SUPPLY                               | Annual               | 11/07/2013      | 010002156287001199 |
| TESCOM                | TC-3000C / BLUETOOTH TESTER                            | Annual               | 04/24/2014      | 3000C000276        |
| Rohde & Schwarz       | CBT / BLUETOOTH TESTER                                 | Annual               | 04/25/2014      | 100422             |
| EMCO                  | 6502.LOOP ANTENNA                                      | Biennial             | 01/11/2014      | 9009-2536          |
| CERNEX                | CBLU1183540 / POWER AMP                                | Annual               | 07/27/2013      | 21691              |
| Agilent               | 8493C / Attenuator(10 dB)                              | Annual               | 07/30/2013      | 76649              |
| WEINSCHEL             | 2-3 / Attenuator(3 dB)                                 | Annual               | 11/07/2013      | BR0617             |