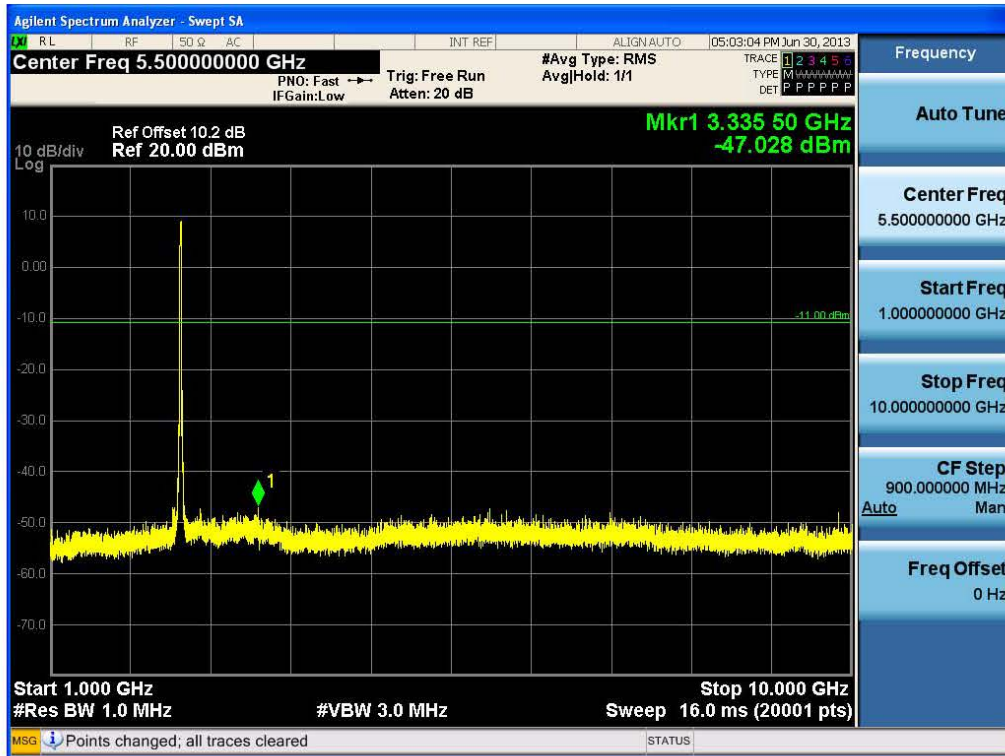


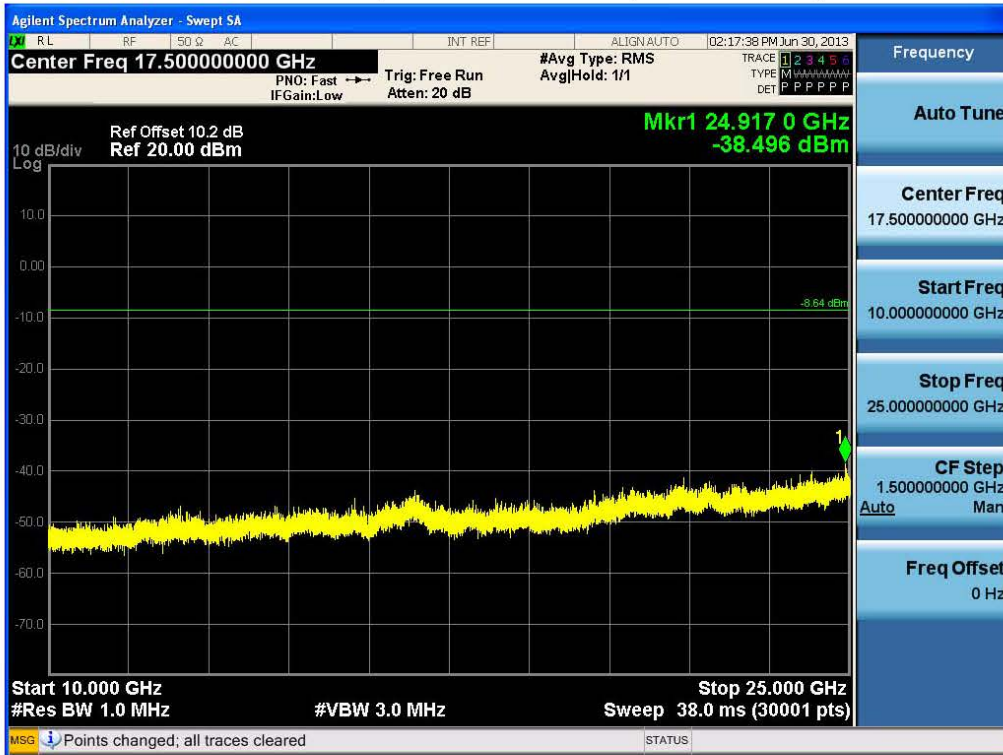
### Conducted Spurious Emission (802.11n-CH11)



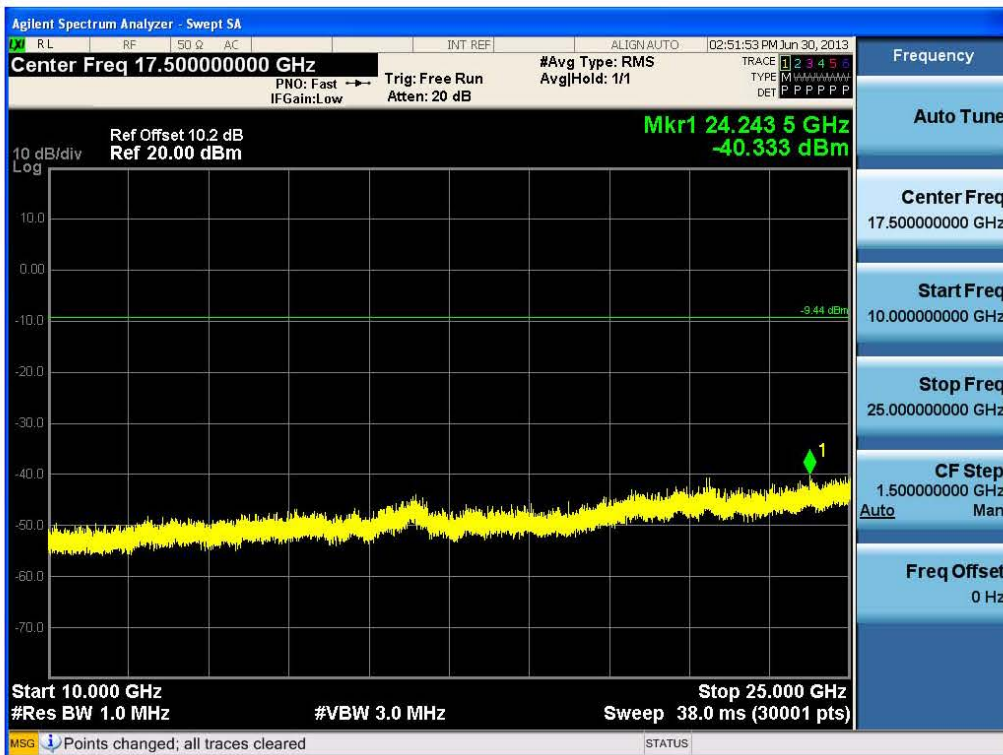
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE410J

10 GHz ~ 25 GHz

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

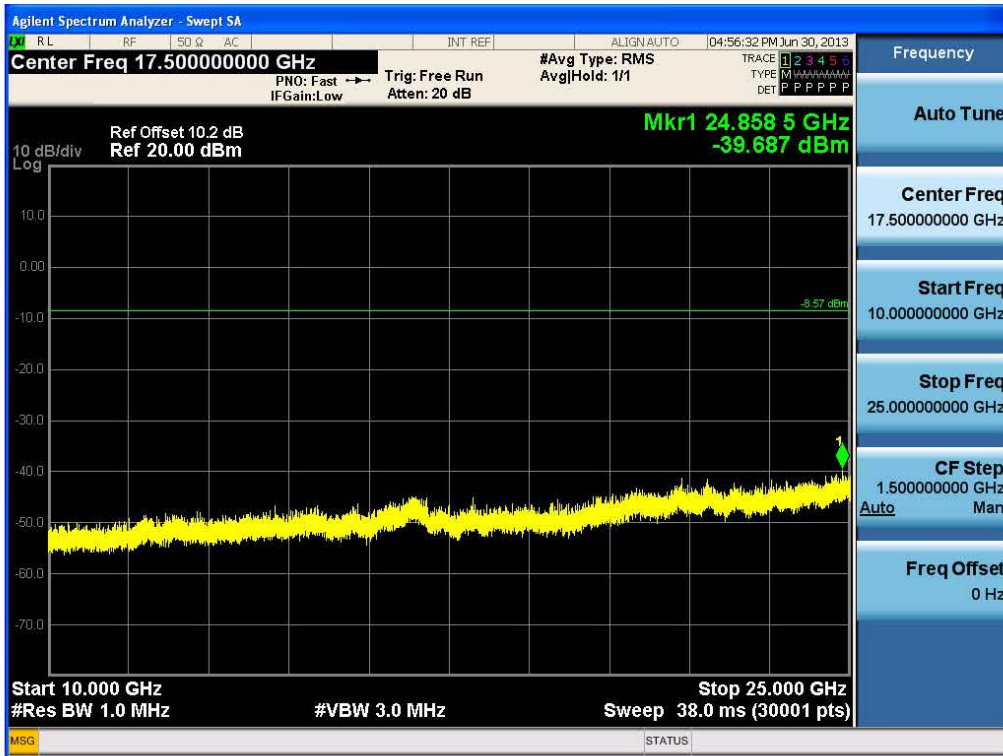


### Conducted Spurious Emission (802.11b-CH6)

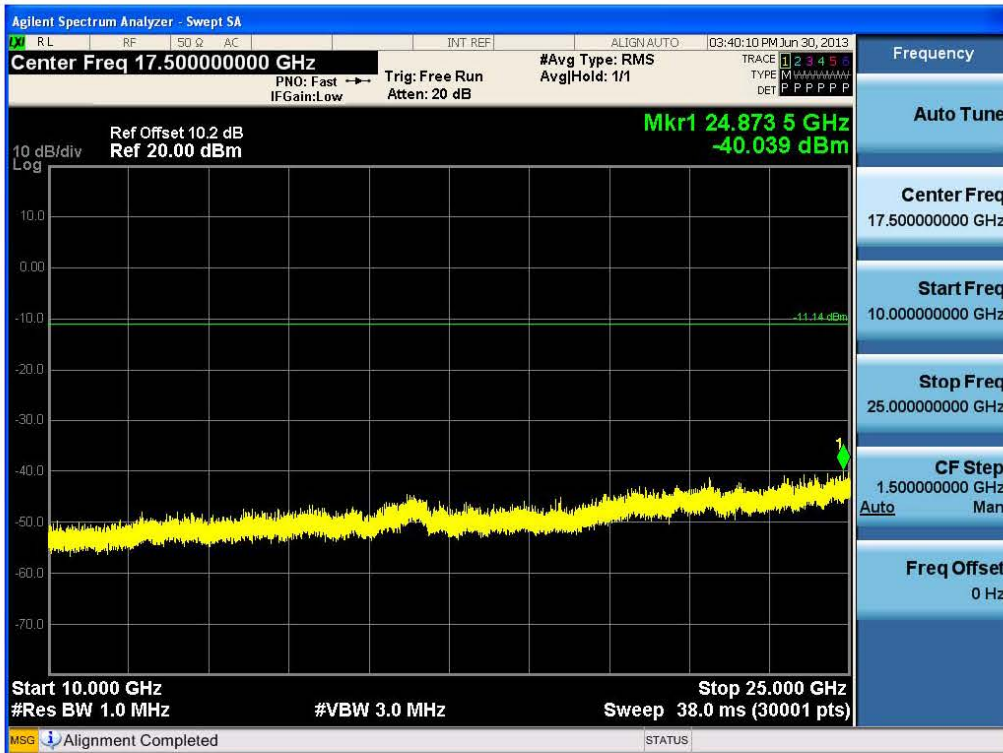


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNF410J

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

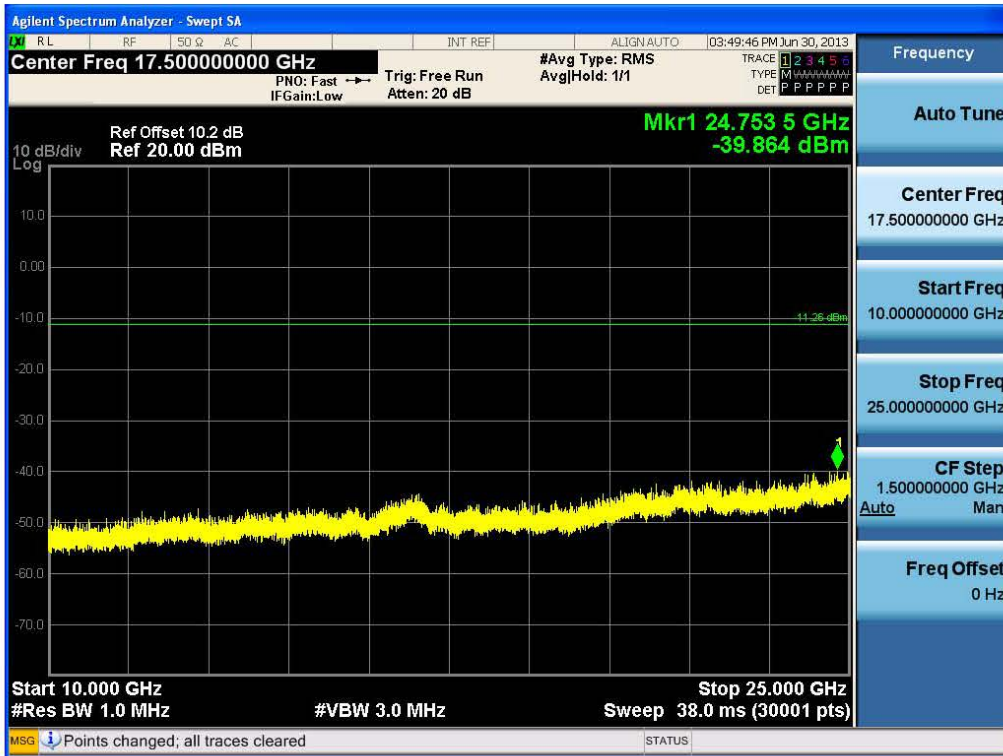


### Conducted Spurious Emission (802.11g-CH1)

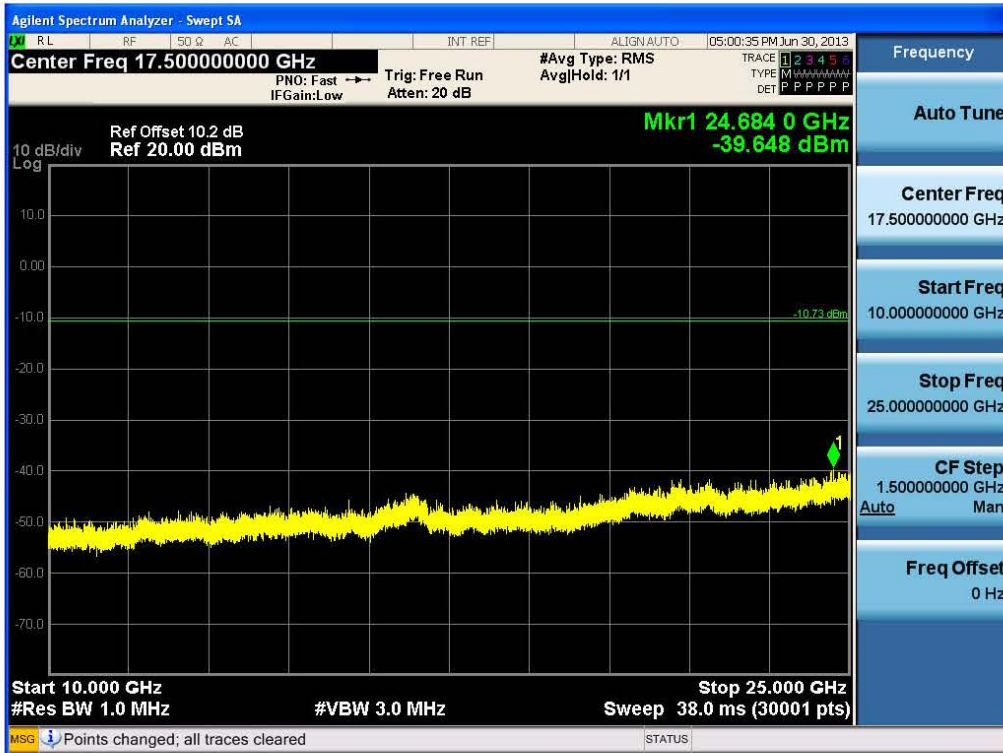


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE410J

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



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



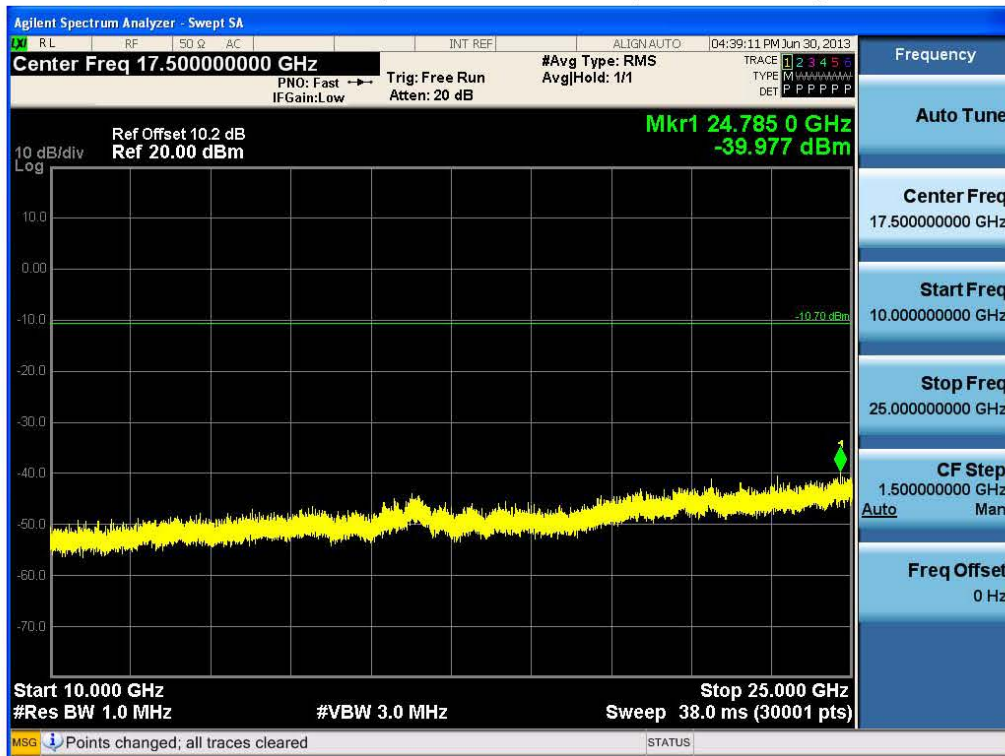
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE410J



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



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



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n	FCC ID: ZNFE410J

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



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WIFI802.11 b/g/n		FCC ID: ZNFE410J

**8.6 RADIATED MEASUREMENT.**

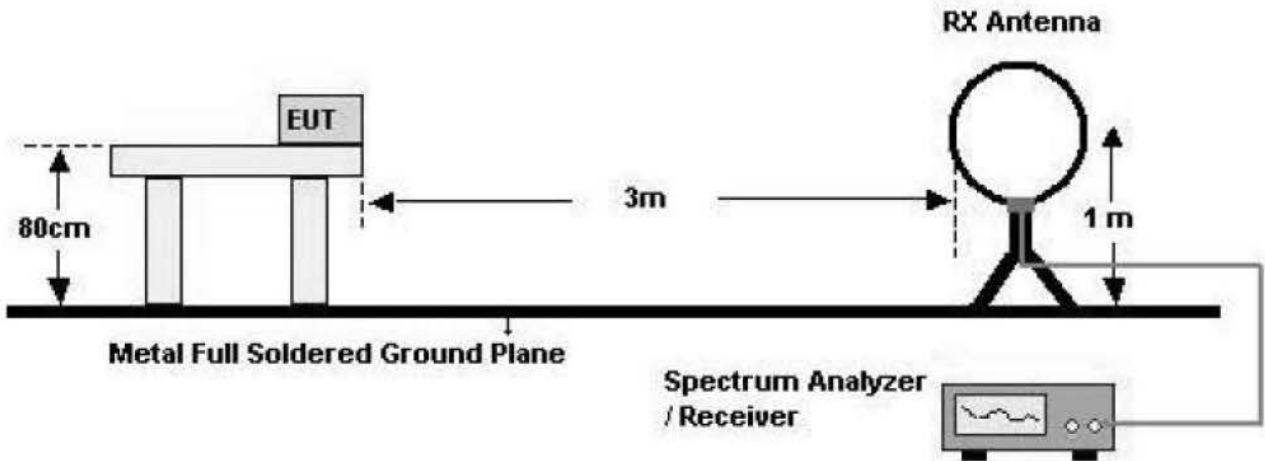
**8.6.1 RADIATED SPURIOUS EMISSIONS.**

Test Requirements and limit, §15.205, §15.209

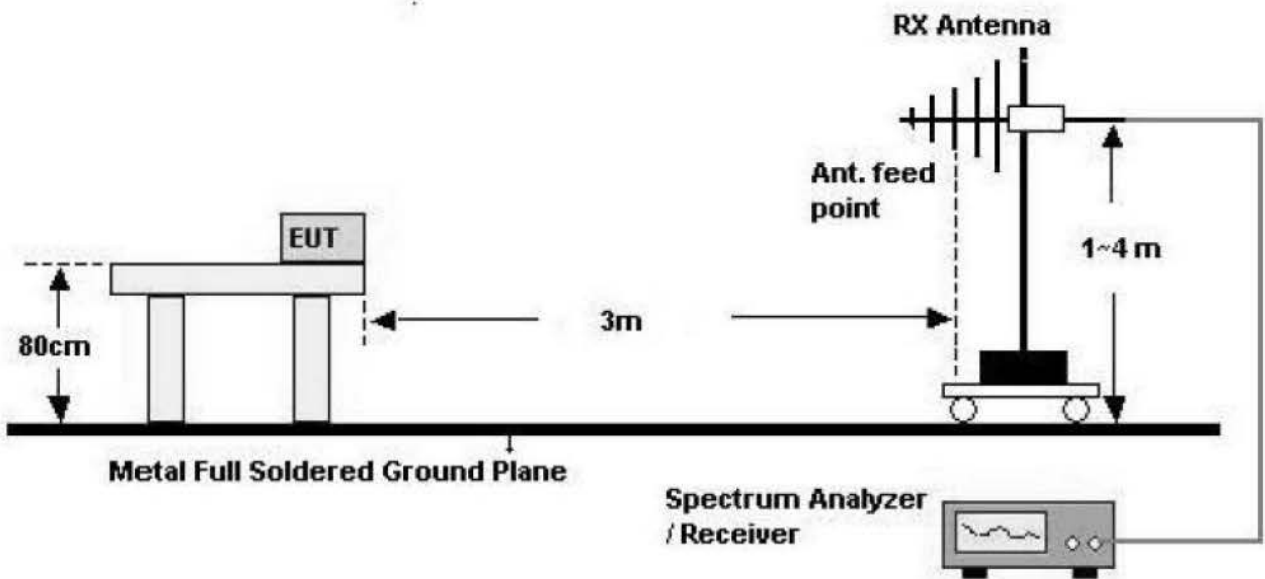
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### Test Configuration

Below 30 MHz



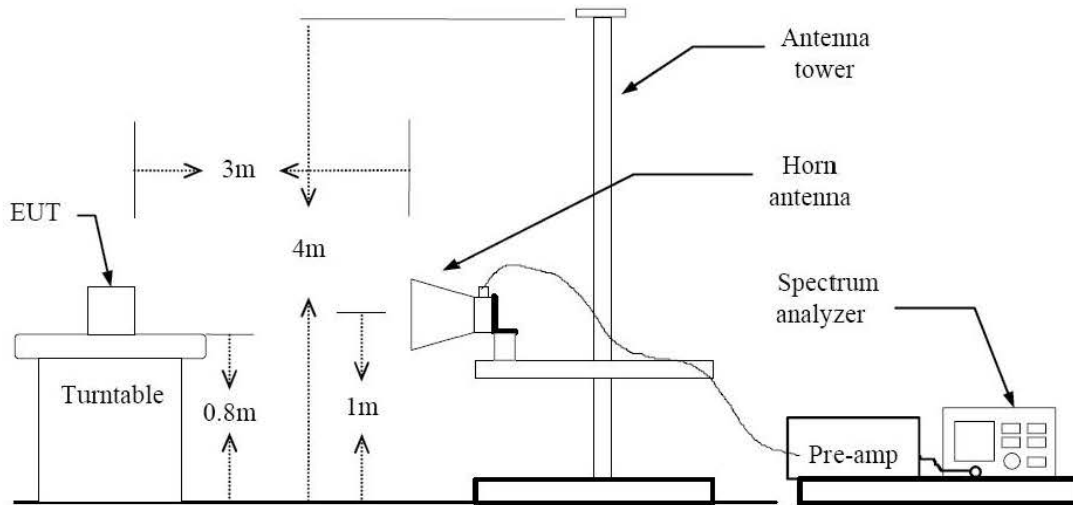
30 MHz - 1 GHz



FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WFI802.11 b/g/n		FCC ID: ZNFE410J



**Above 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 ≥ 3 x 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 x 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.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1307FR19	Date of Issue: July 16, 2013	EUT Type: GSM/WCDMA Phone with Bluetooth3.0, WFI802.11 b/g/n		FCC ID: ZNFE410J

Note: The actual setting value of VBW

Mode	Worst Data rate (Mbps)	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
b	1	12.420	12.520	99.201278	-	-
g	6	2.064	2.170	95.115207	460.8	1000
n	6.5	1.920	2.020	95.049505	520.8	1000

**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 [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	51.54	-0.79	V	50.75	74	23.25	PK
4824	41.63	-0.79	V	40.84	54	13.16	AV
7236	50.06	9.08	V	59.14	74	14.86	PK
7236	37.68	9.08	V	46.76	54	7.24	AV
4824	51.52	-0.79	H	50.73	74	23.27	PK
4824	40.57	-0.79	H	39.78	54	14.22	AV
7236	49.76	9.08	H	58.84	74	15.16	PK
7236	37.75	9.08	H	46.83	54	7.17	AV

Operation Mode: 802.11 g  
 Transfer Rate: 6 Mbps  
 Operating Frequency: 2412  
 Channel No. 01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	51.12	-0.79	V	50.33	74	23.67	PK
4824	37.39	-0.79	V	36.6	54	17.40	AV
7236	48.39	9.08	V	57.47	74	16.53	PK
7236	36.05	9.08	V	45.13	54	8.87	AV
4824	50.79	-0.79	H	50	74	24.00	PK
4824	37.28	-0.79	H	36.49	54	17.51	AV
7236	49.12	9.08	H	58.2	74	15.80	PK
7236	36.10	9.08	H	45.18	54	8.82	AV

Operation Mode: 802.11 n  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency: 2412  
 Channel No. 01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.14	-0.79	V	49.35	74	24.65	PK
4824	37.40	-0.79	V	36.61	54	17.39	AV
7236	49.23	9.08	V	58.31	74	15.69	PK
7236	35.88	9.08	V	44.96	54	9.04	AV
4824	49.94	-0.79	H	49.15	74	24.85	PK
4824	37.22	-0.79	H	36.43	54	17.57	AV
7236	48.69	9.08	H	57.77	74	16.23	PK
7236	35.94	9.08	H	45.02	54	8.98	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 is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
7. We used the case 1 for 802.11b and the case 2 for 802.11g/n mode to perform the average filed strength measurements.



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

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.81	-0.37	V	50.44	74	23.56	PK
4874	38.48	-0.37	V	38.11	54	15.89	AV
7311	49.26	8.64	V	57.90	74	16.10	PK
7311	37.18	8.64	V	45.82	54	8.18	AV
4874	50.09	-0.37	H	49.72	74	24.28	PK
4874	38.63	-0.37	H	38.26	54	15.74	AV
7311	49.23	8.64	H	57.87	74	16.13	PK
7311	37.23	8.64	H	45.87	54	8.13	AV

Operation Mode: 802.11 g  
 Transfer Rate: 6 Mbps  
 Operating Frequency: 2437  
 Channel No.: 06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	49.99	-0.37	V	49.62	74	24.38	PK
4874	36.29	-0.37	V	35.92	54	18.08	AV
7311	48.96	8.64	V	57.60	74	16.40	PK
7311	35.50	8.64	V	44.14	54	9.86	AV
4874	49.77	-0.37	H	49.40	74	24.60	PK
4874	36.33	-0.37	H	35.96	54	18.04	AV
7311	48.94	8.64	H	57.58	74	16.42	PK
7311	35.31	8.64	H	43.95	54	10.05	AV