



HCT.CO., LTD.

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CERTIFICATE OF COMPLIANCE

FCC PART 15.247 Certification

Applicant Name:

Nokia, Inc.

12278 Scripps Summit Drive, San Diego,
CA 92131

Date of Testing:

Nov. 08, 2007

Test Site/Location:

HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si,
Kyungki-do, Korea

Test Report No.: HCT-R07-037

HCT FRN: 0005866421

FCC ID:

QMNRN-347

APPLICANT:

Nokia, Inc.

Model(s): RM-347
EUT Type: Dual-Band CDMA/ EV-DO Phone with Bluetooth(Prototype)
Max. RF Output Power: 2.82 dBm(1.91 mW)
Frequency Range: 2402 - 2480 MHz (Bluetooth)
Modulation type GFSK(Normal)
FCC Classification: FCC Part 15 Frequency Hopping Spread Spectrum Transceiver
FCC Rule Part(s): Part 15 subpart C 15.247
IC Rule Part(s): RSS-GEN Issue 2, RSS-210 Issue7
Application Type: Certification

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT.CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a).

Youn Seok Jung
Report prepared by

: Youn Seok Jung

Test engineer of RF Part

Sang Jun Lee
Approved by

: Sang Jun Lee

Manager of RF Part

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1. GENERAL INFORMATION

Applicant: Nokia, Inc.
12278 Scripps Summit Drive, San Diego,
CA 92131

EUT: Dual-Band CDMA/ EV-DO Phone with Bluetooth(Prototype)

Model: RM-347

Date of Test: Nov. 08, 2007

Contact person: Name: Mary Washington
Phone #: 858-831-5000
Fax #: 8585-831-6500

2. EUT DESCRIPTION

Product	Dual-Band CDMA/ EV-DO Phone with Bluetooth(Prototype)
Model Name	RM-347
Power Supply	DC 3.7 V
Battery type	Standard: BL-5C Extended: BL-10C
Frequency Range	2402 ~ 2480 MHz
Transmit Power	2.82 dBm(1.91 mW)
Modulation Type	GFSK(Normal)
Modulation Technique	FHSS
Number of Channels	79 Channels
Antenna Specification	Manufacturer: Ace Antenna Corp. Antenna type: Chip antenna Gain : -9.18 dBi

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3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003) and FCC Public Notice DA 00-705 dated March 30, 2000 entitled "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" were used in the measurement of the **Nokia Dual-Band CDMA/ EV-DO Phone with Bluetooth** FCC ID: **QMNRN-347**

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

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4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

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5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs for the actual connections between EUT and support equipment.

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7. FCC PART 15.247 REQUIREMENTS

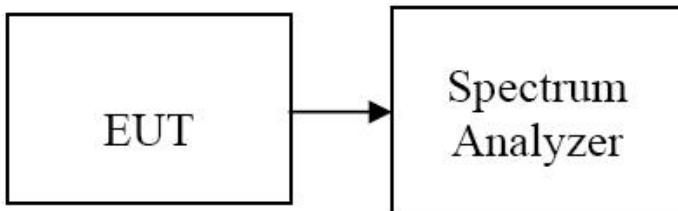
7.1 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902 ~ 928 MHz, 2400 ~ 2483.5 MHz, and 5725 ~ 5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the peak detector mode.

1. Span = 2 MHz
2. RBW = 1 MHz
3. VBW = 3 MHz
4. Sweep = auto

TEST RESULTS

No non-compliance noted

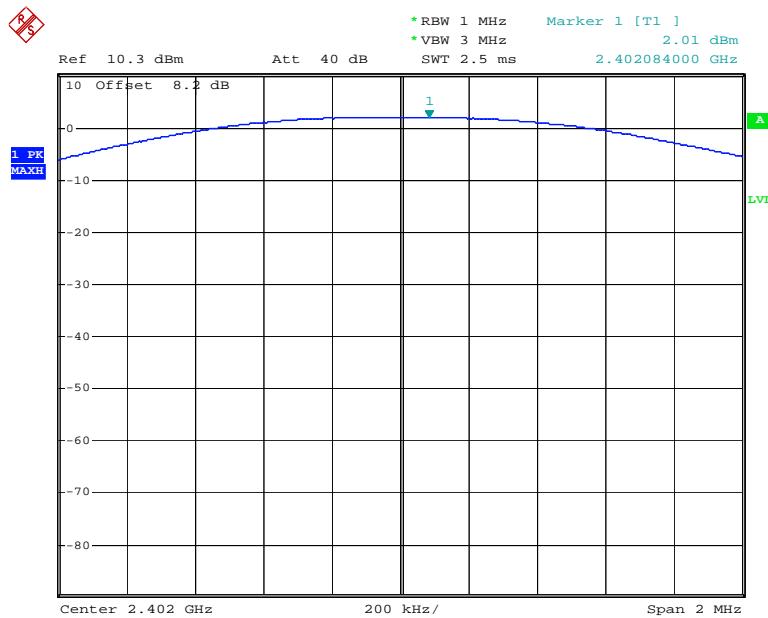
Test Data

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (W)	Result
Low	2402	2.01	1.59	1	PASS
Mid	2441	2.55	1.80		PASS
High	2480	2.82	1.91		PASS

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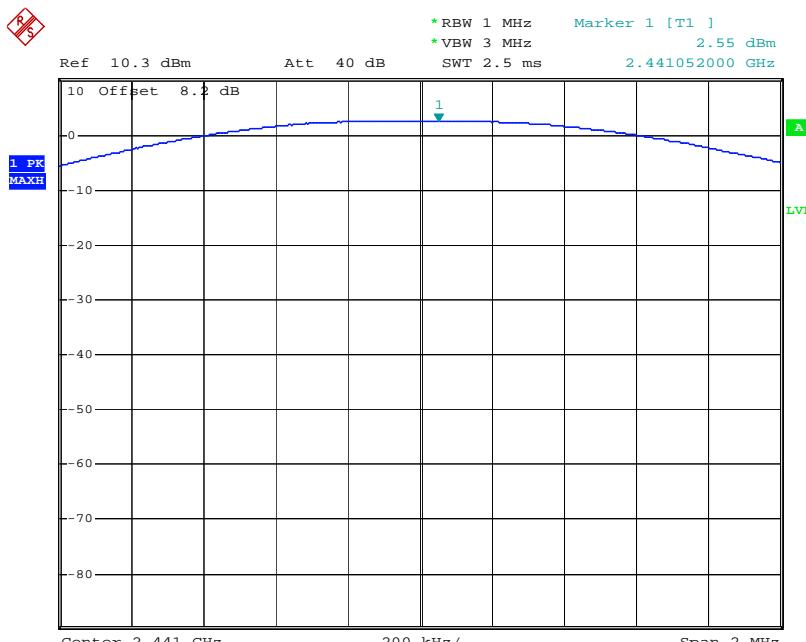
Test Plots

Peak Power (Low CH)



Date: 25.OCT.2007 03:17:10

Peak Power (Mid CH)

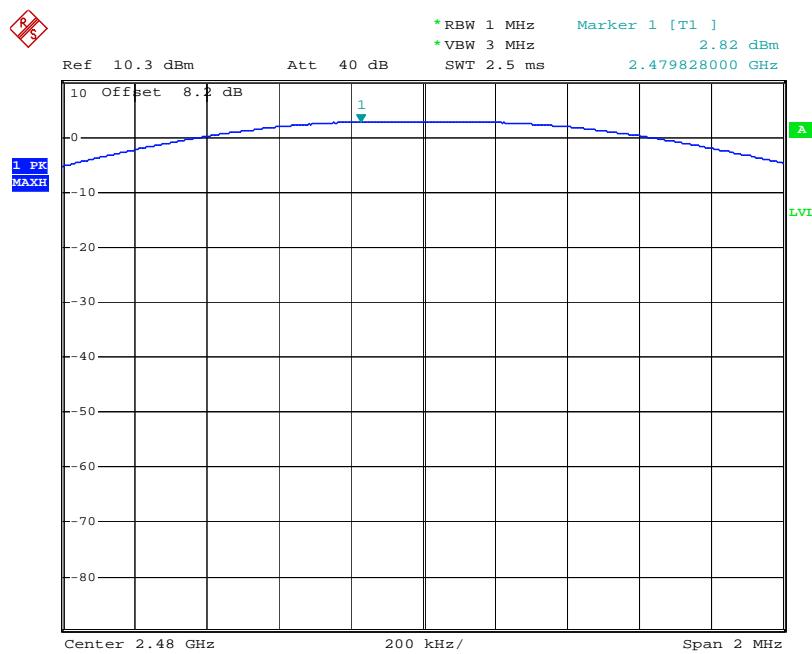


Date: 25.OCT.2007 03:18:06

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Peak Power (High CH)



Date: 25.OCT.2007 03:18:38

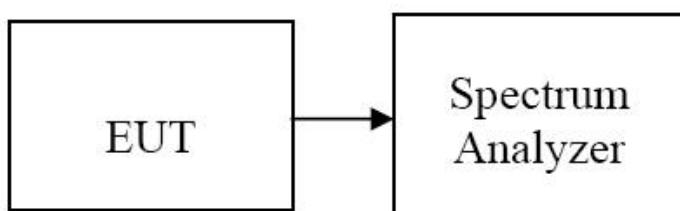
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7.2 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Configuration



TEST PROCEDURE

The spectrum analyzer is set to :

1. Span = 8 MHz
2. RBW = 100 KHz
3. VBW = 300 KHz
4. Sweep = auto

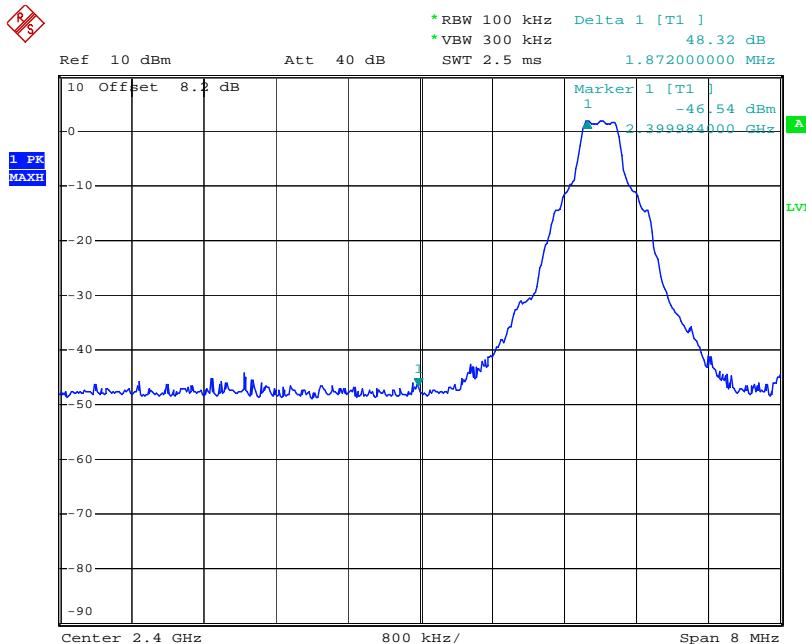
TEST RESULTS

See attached.

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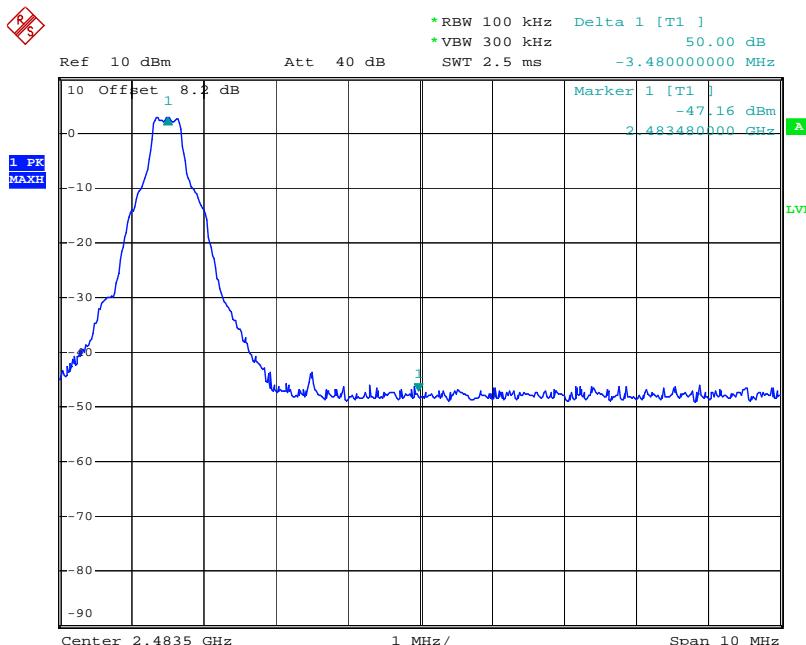
Test Data (Standard Battery)

Band Edges (Low- CH)



Date: 25.OCT.2007 03:22:12

Band Edges (High-CH)

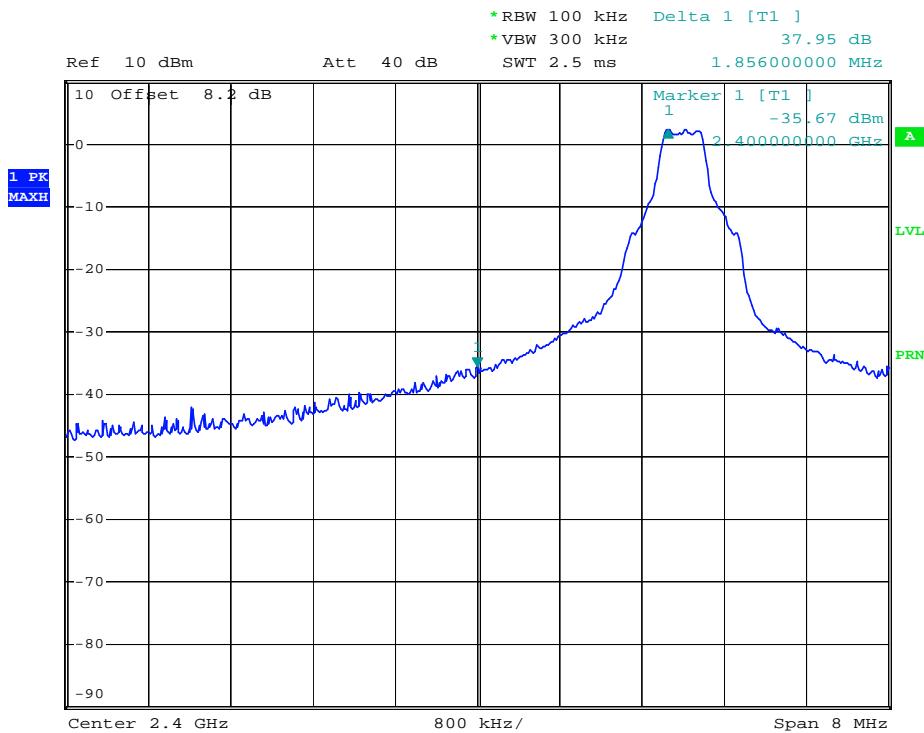


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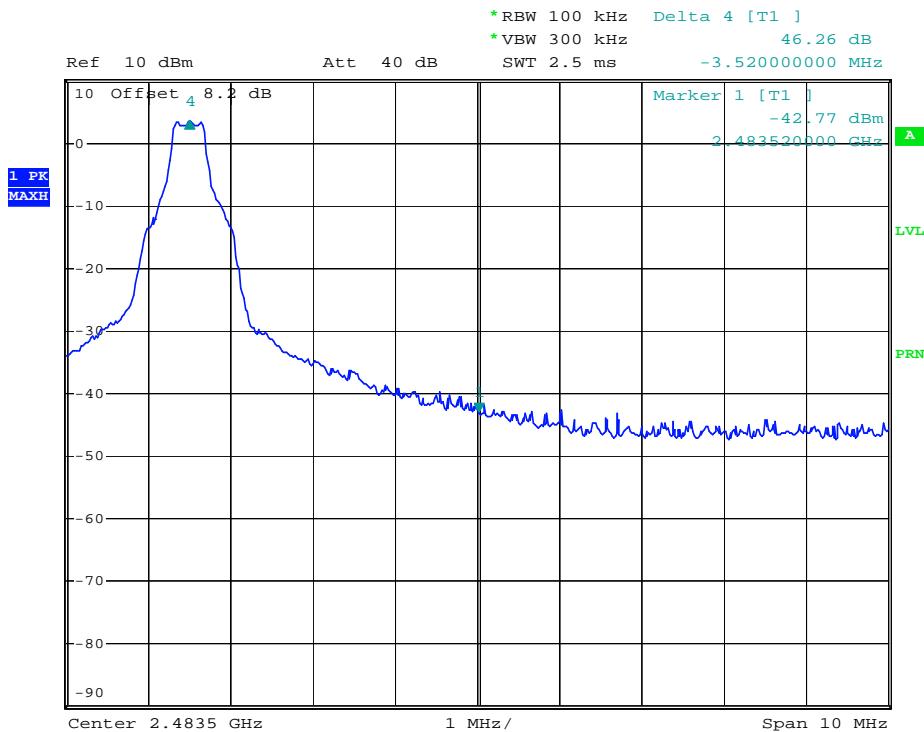
Test Data (Extended Battery)

Band Edges (Low- CH)



Date: 9.NOV.2007 12:17:40

Band Edges (High-CH)



Date: 9.NOV.2007 12:18:57

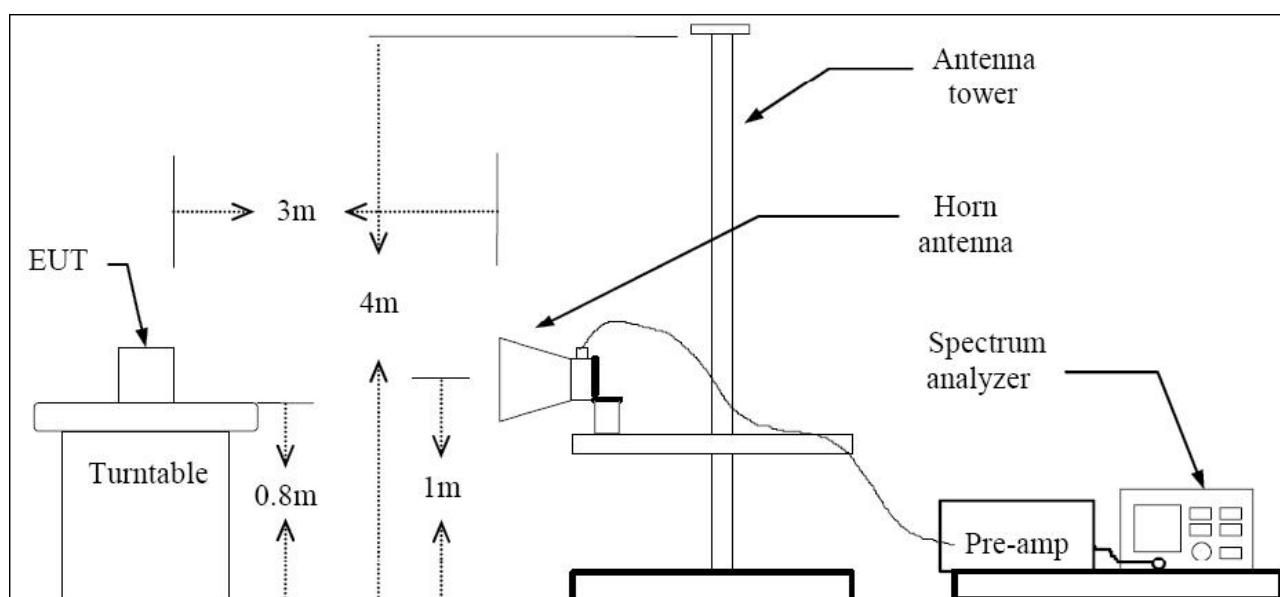
FCC CERTIFICATION REPORT		www.hct.co.kr		
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7.2.1 BAND EDGES MEASUREMENT (RADIATED))

LIMIT

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW = VBW = 1 MHz / Sweep = AUTO
 - (b) AVERAGE: RBW = 1 MHz / VBW = 10 Hz / Sweep = AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

Test Data

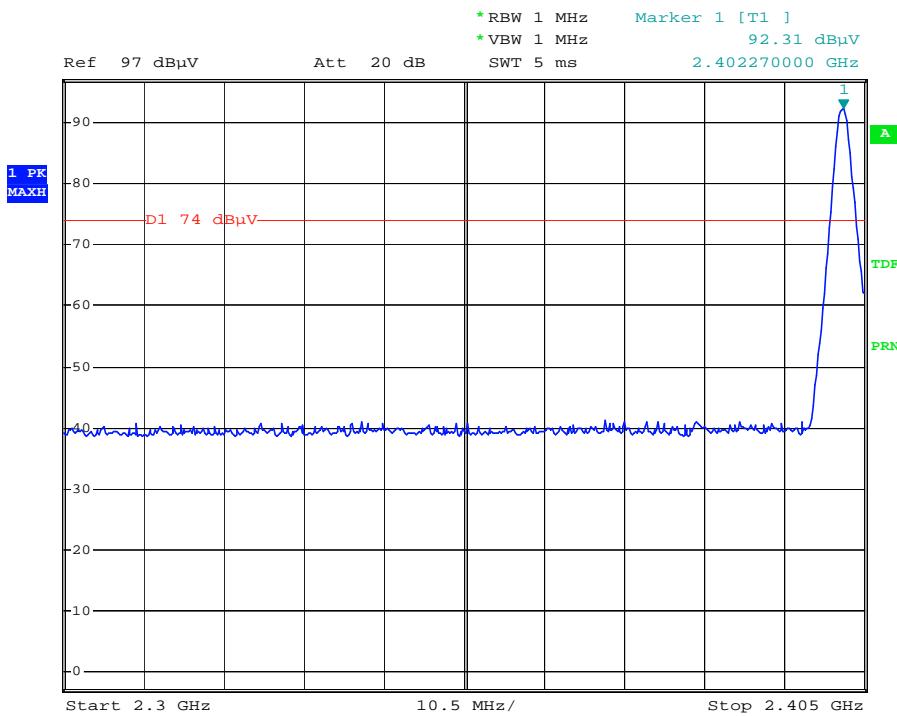
HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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Test Plots, (Standard Battery)

(Low- CH)

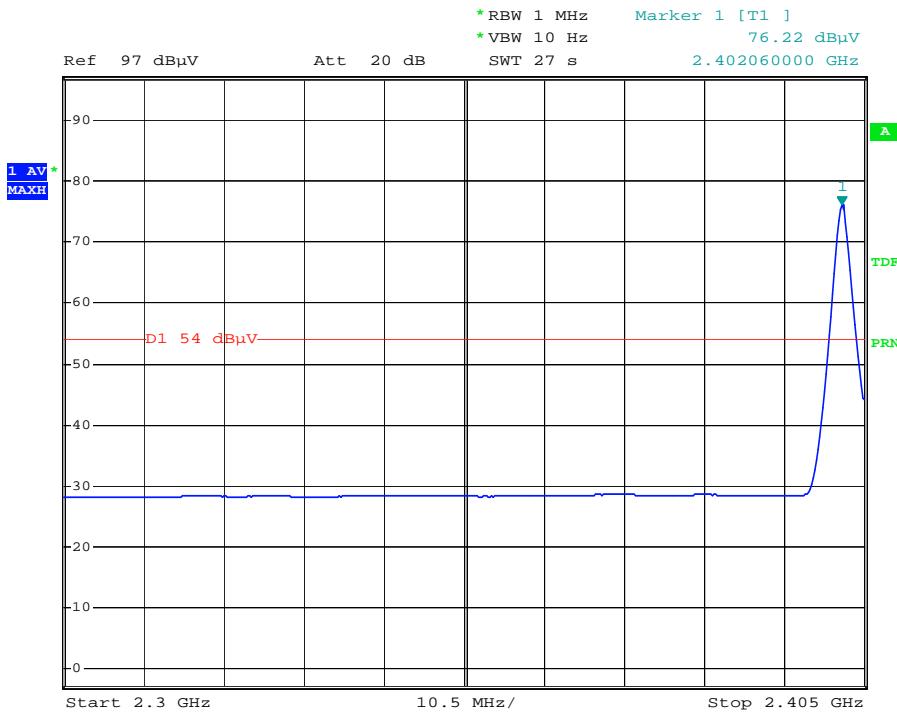
Polarity: Vertical

Detector mode: Peak



Date: 26.OCT.2007 08:52:18

Detector mode: Average



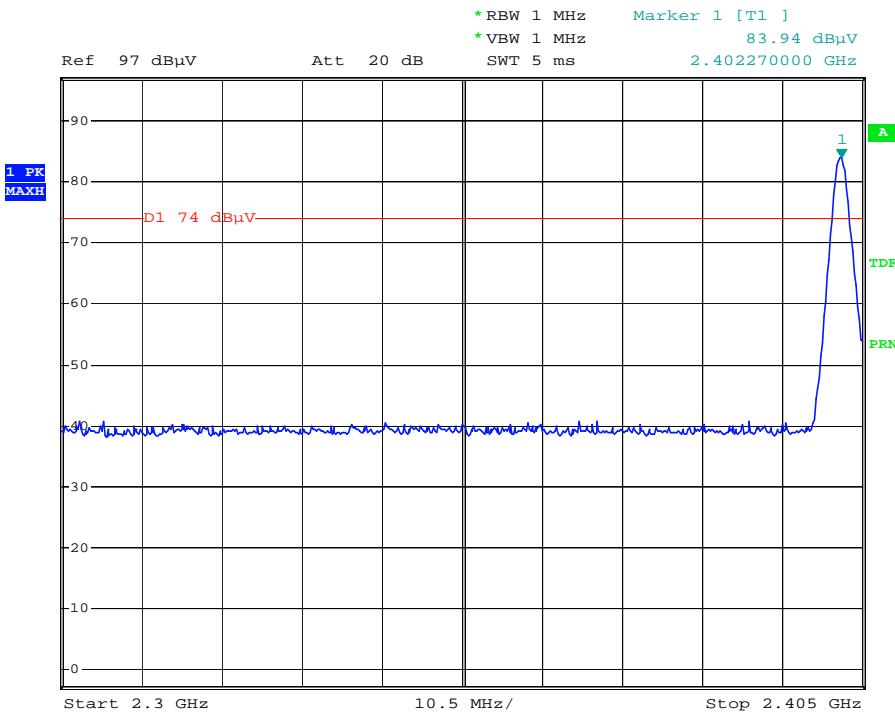
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(Low- CH)

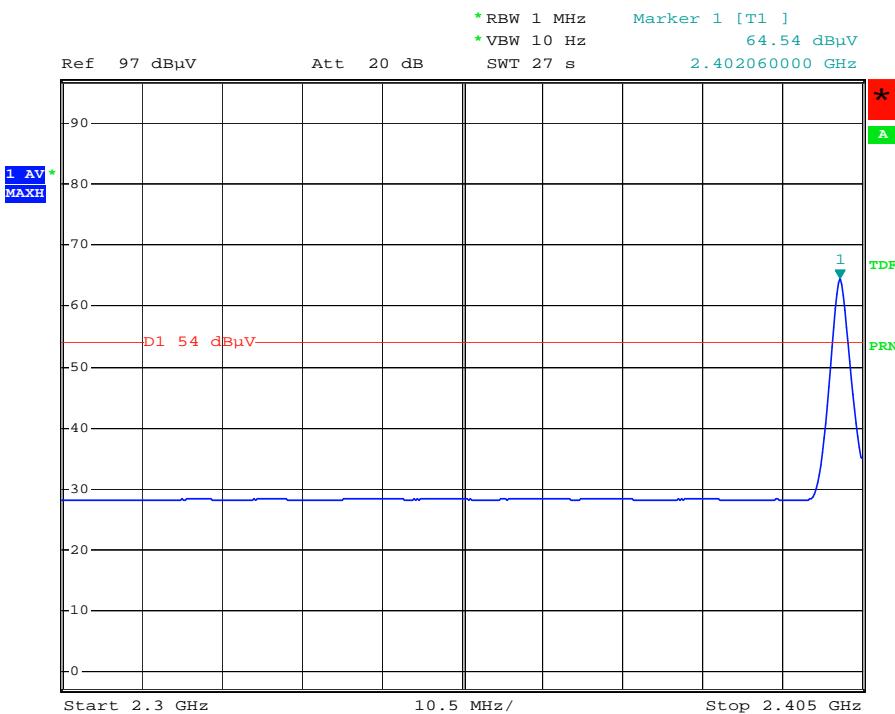
Polarity: Horizontal

Detector mode: Peak



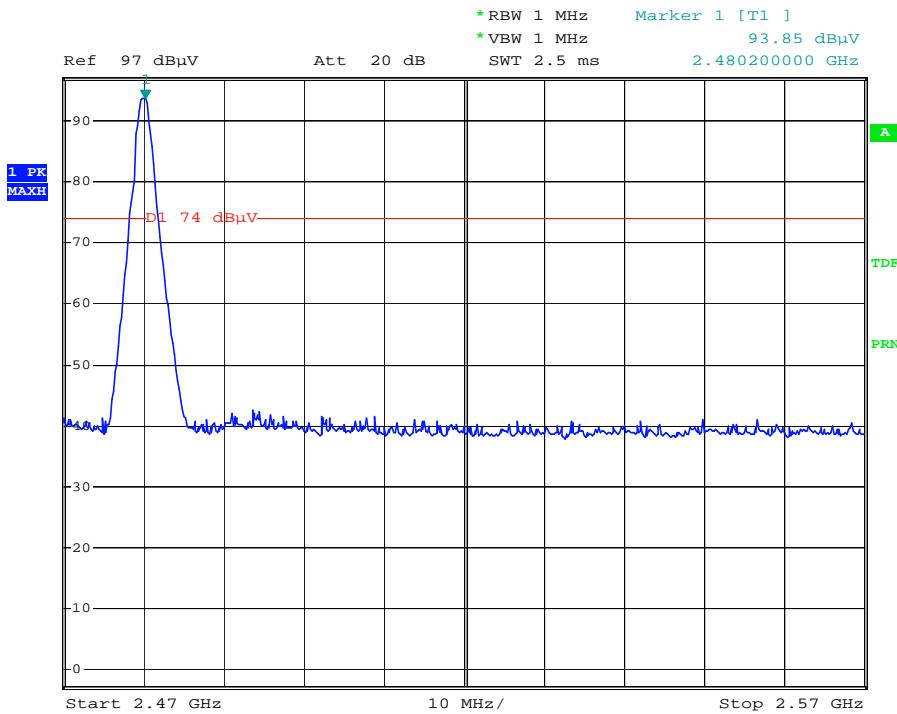
Date: 26.OCT.2007 08:57:13

Detector mode: Average

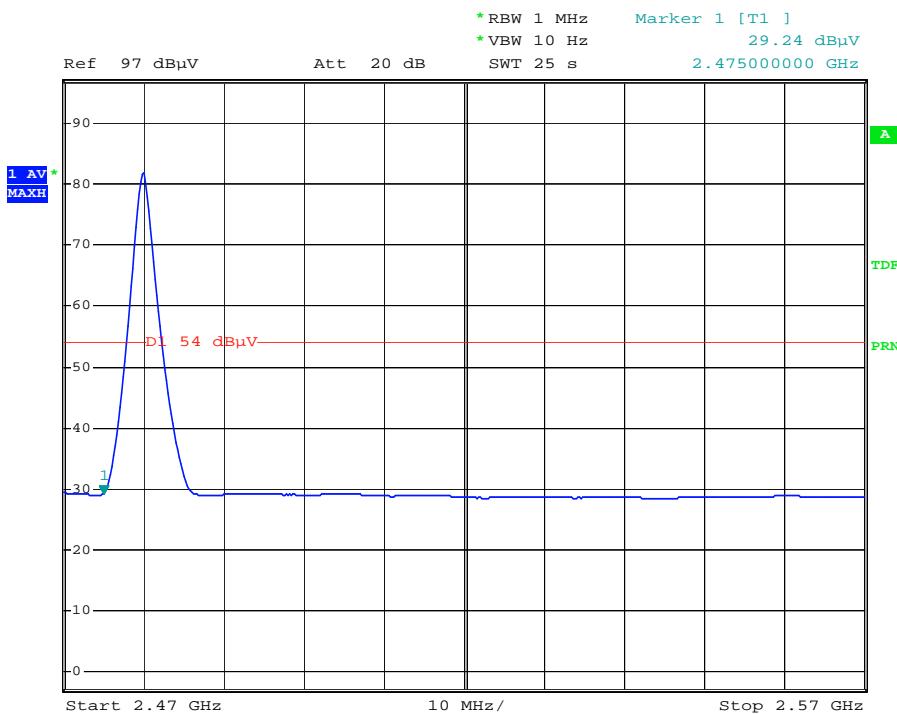


Date: 26.OCT.2007 08:55:30

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Test Plots, (High- CH)
Polarity: Vertical
Detector mode: Peak


Date: 26.OCT.2007 09:10:00

Detector mode: Average


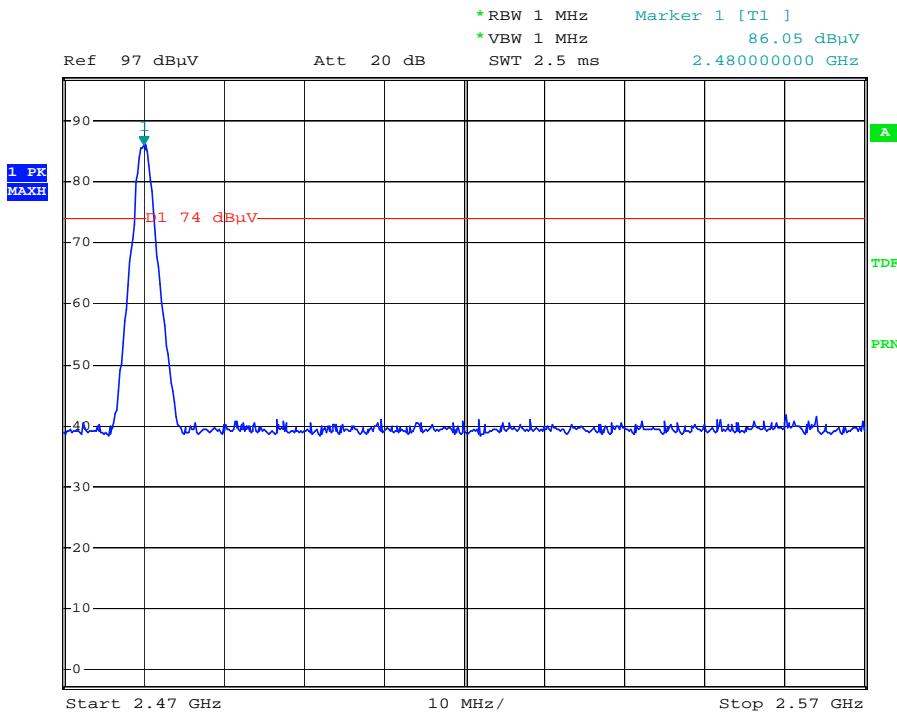
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(High- CH)

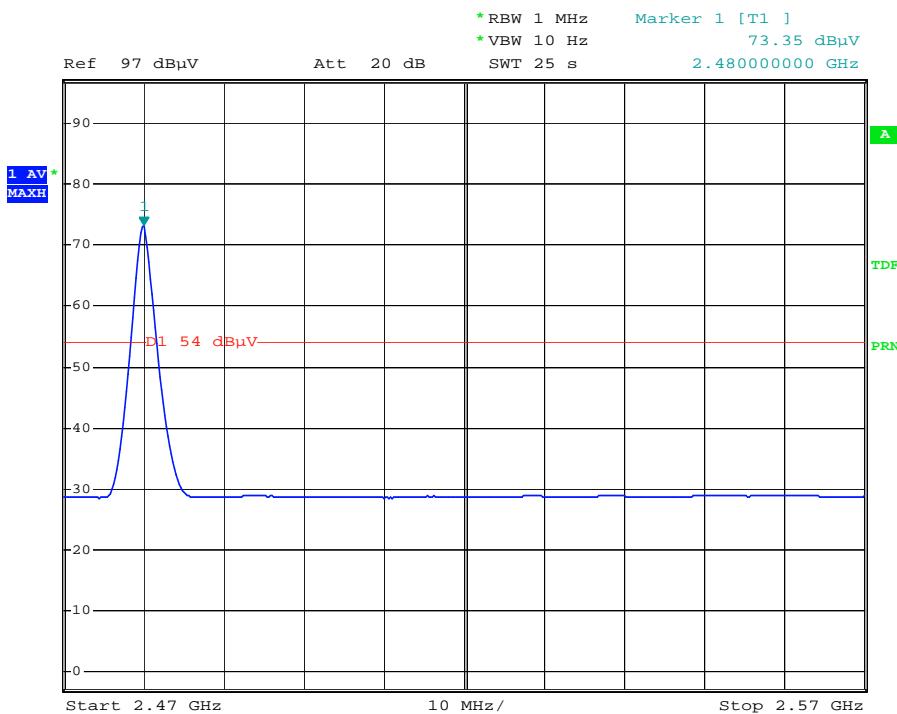
Polarity: Horizontal

Detector mode: Peak



Date: 26.OCT.2007 09:01:34

Detector mode: Average



Date: 26.OCT.2007 09:03:25

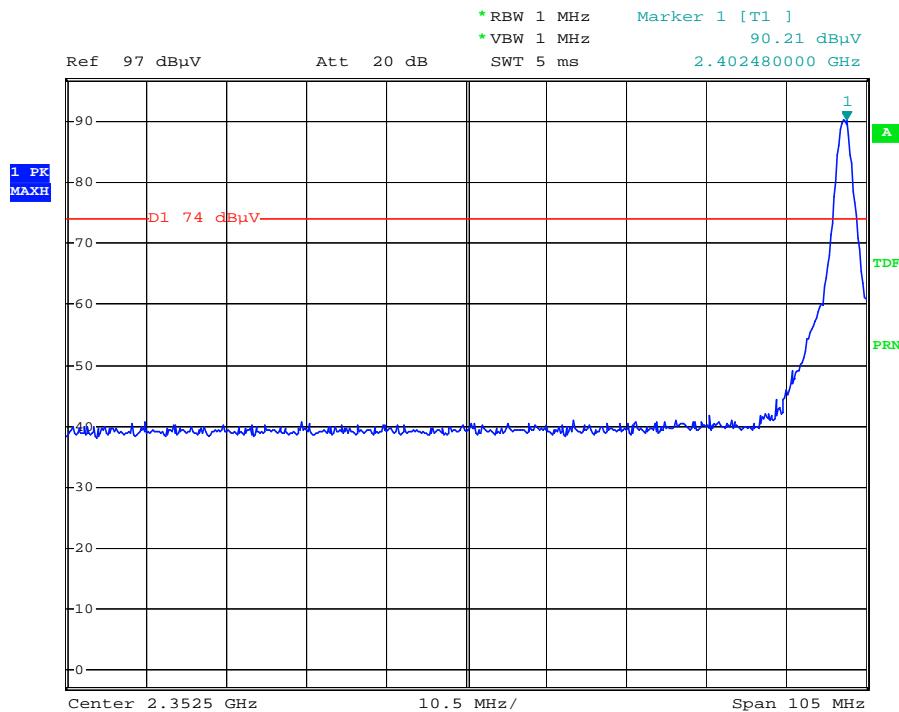
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Test Plots, (Extended Battery)

(Low- CH)

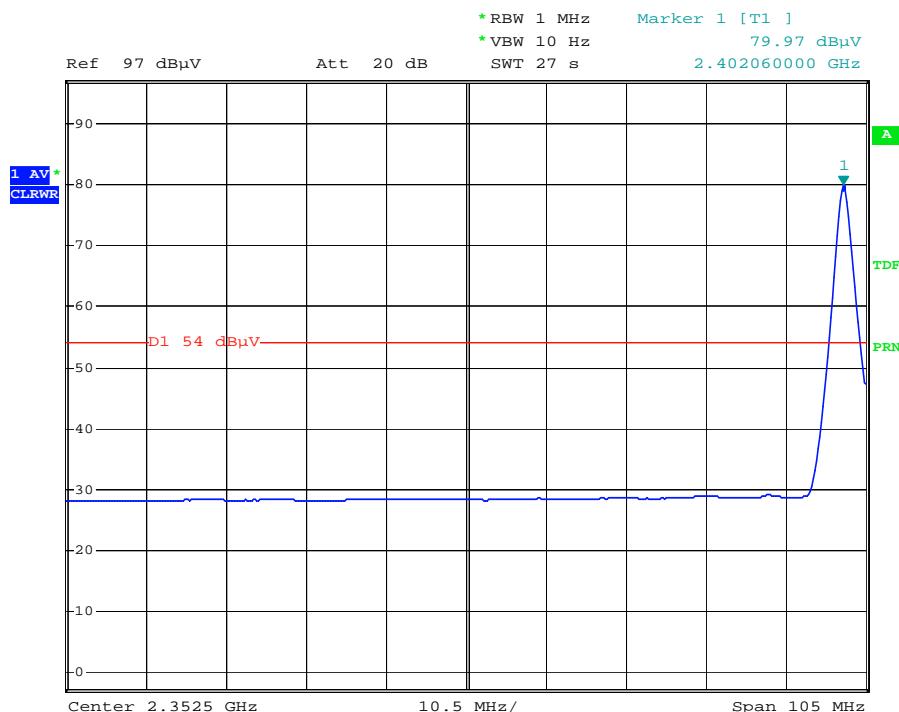
Polarity: Vertical

Detector mode: Peak



Date: 8.NOV.2007 15:35:41

Detector mode: Average



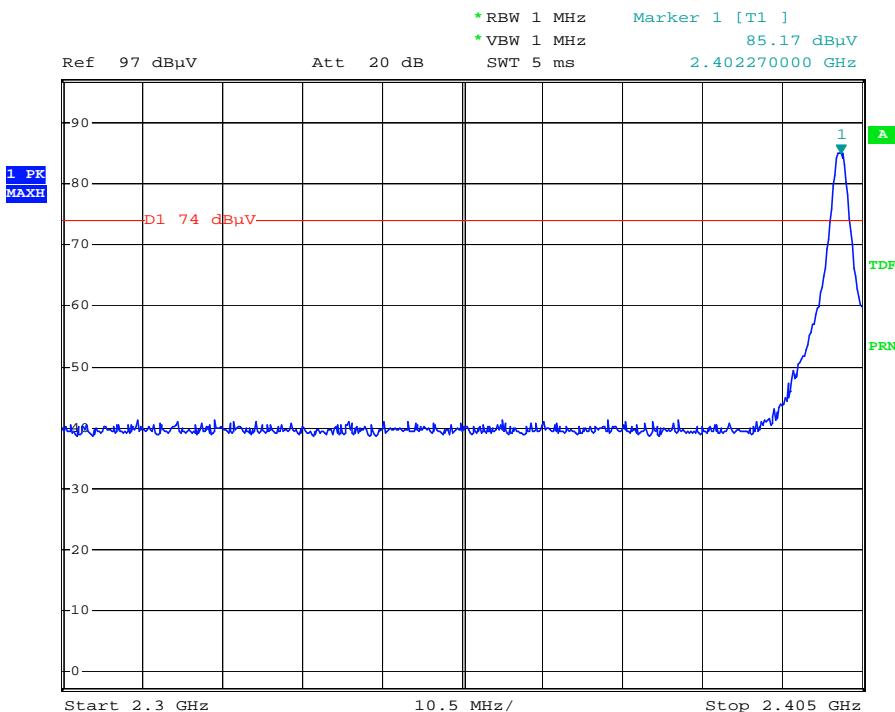
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(Low- CH)

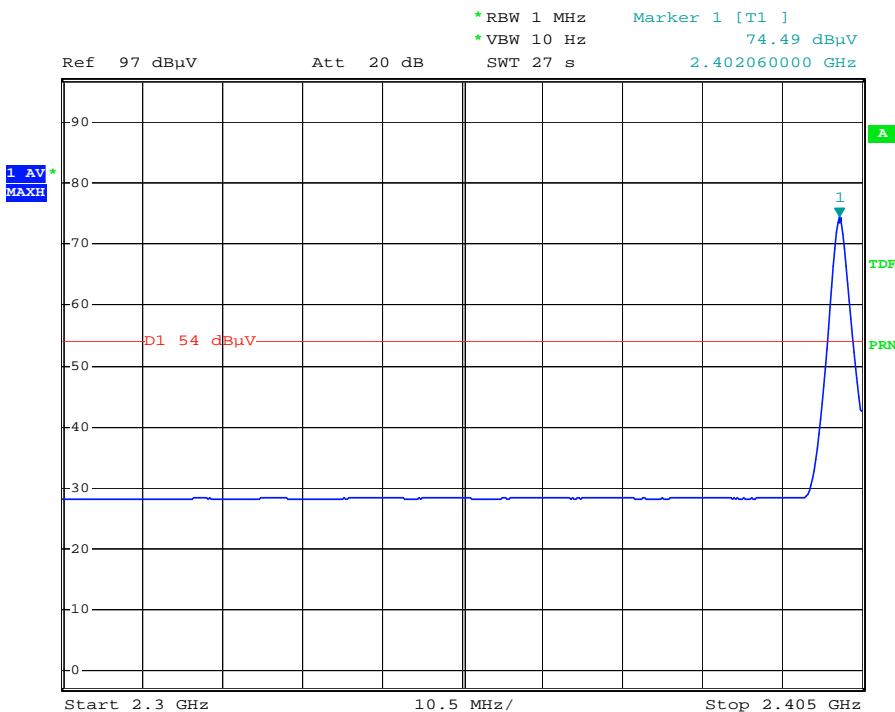
Polarity: Horizontal

Detector mode: Peak



Date: 8.NOV.2007 15:39:46

Detector mode: Average



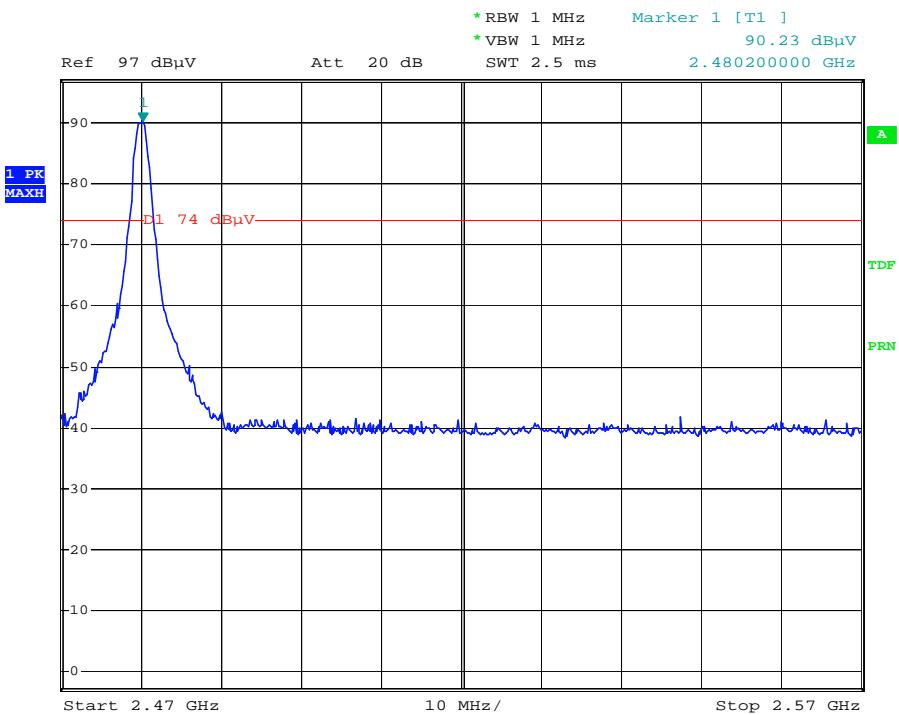
Date: 8.NOV.2007 15:41:28

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(High- CH)

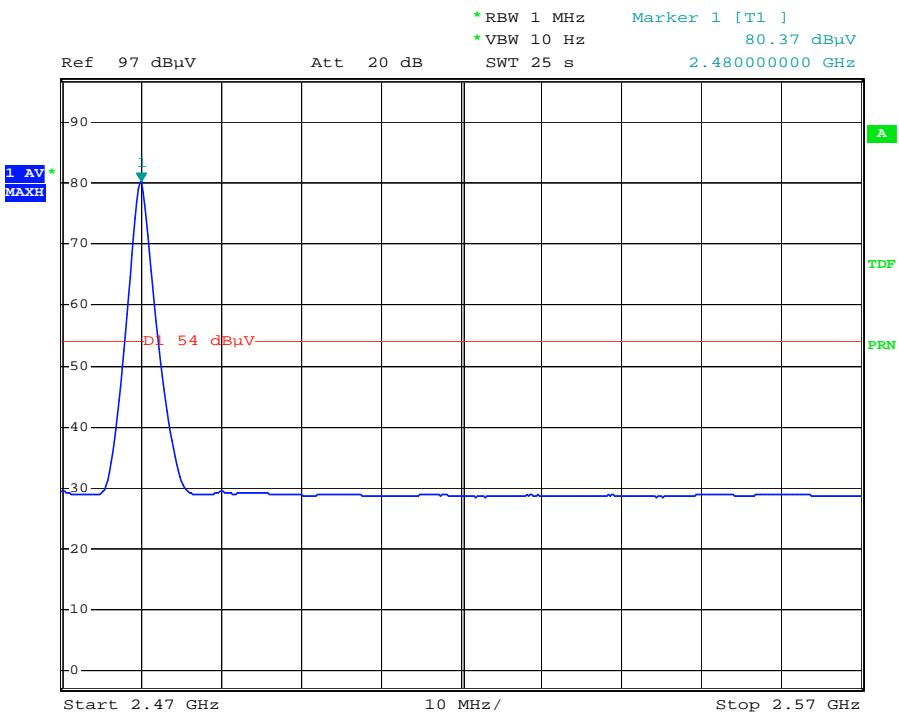
Polarity: Horizontal

Detector mode: Peak



Date: 8.NOV.2007 15:49:53

Detector mode: Average



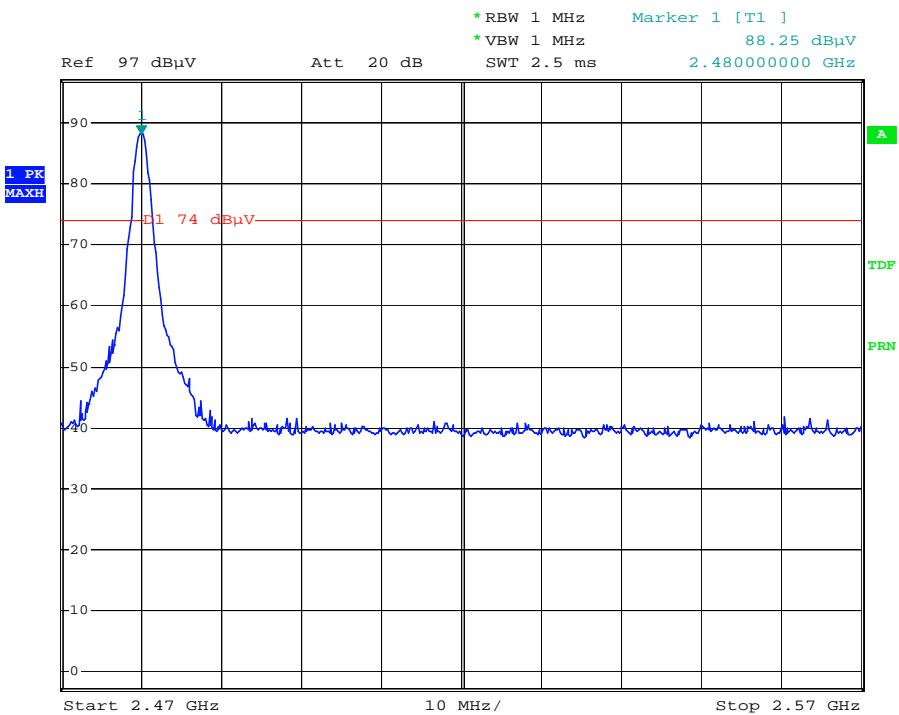
Date: 8.NOV.2007 15:51:15

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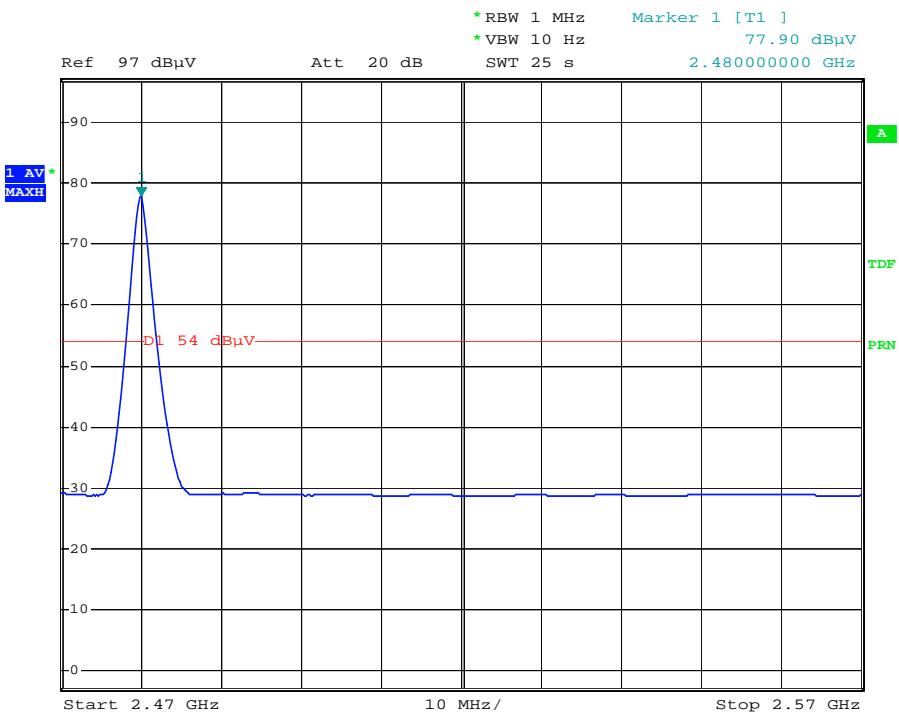
Polarity: Horizontal

Detector mode: Peak



Date: 8.NOV.2007 15:45:52

Detector mode: Average



Date: 8.NOV.2007 15:47:21

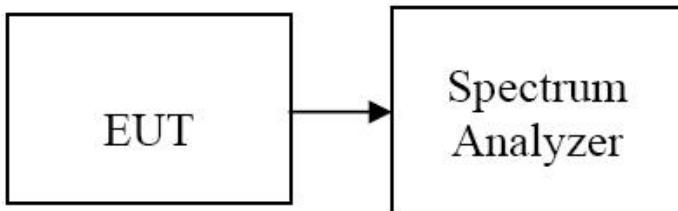
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7.3 FREQUENCY SEPARATION

LIMIT

According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Test Configuration



TEST PROCEDURE

The spectrum analyzer is set to :

1. Span = 3 MHz
2. RBW = 100 KHz
3. VBW = 300 KHz
4. Sweep = auto

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

TEST RESULTS

No non-compliance noted

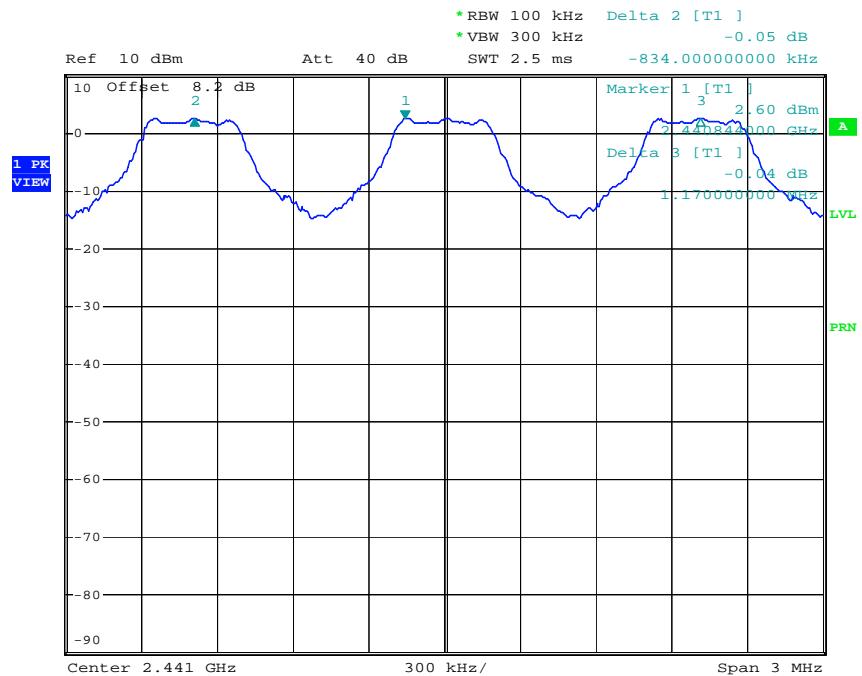
Test Data

Channel Separation (MHz)	20dB Bandwidth (KHz)		Limit (KHz)	Result
0.834	Low CH	990	>25	Pass
	Middle CH	924		
	High CH	924		

HCT PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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Test Plot

Measurement of Channel Separation

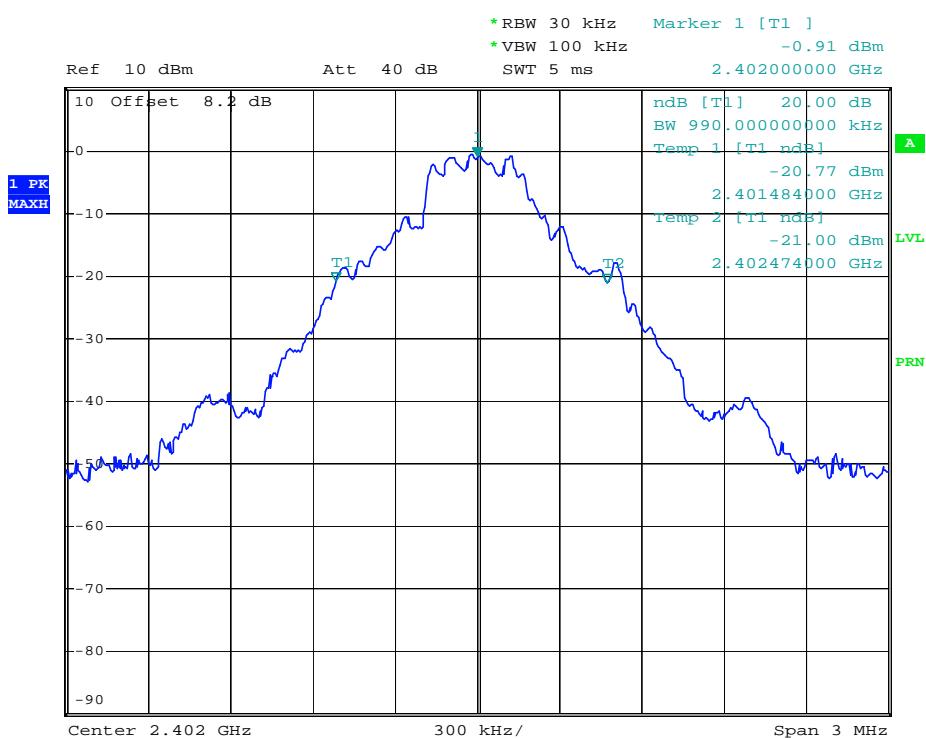


Date: 25.OCT.2007 10:42:05

Test Plot

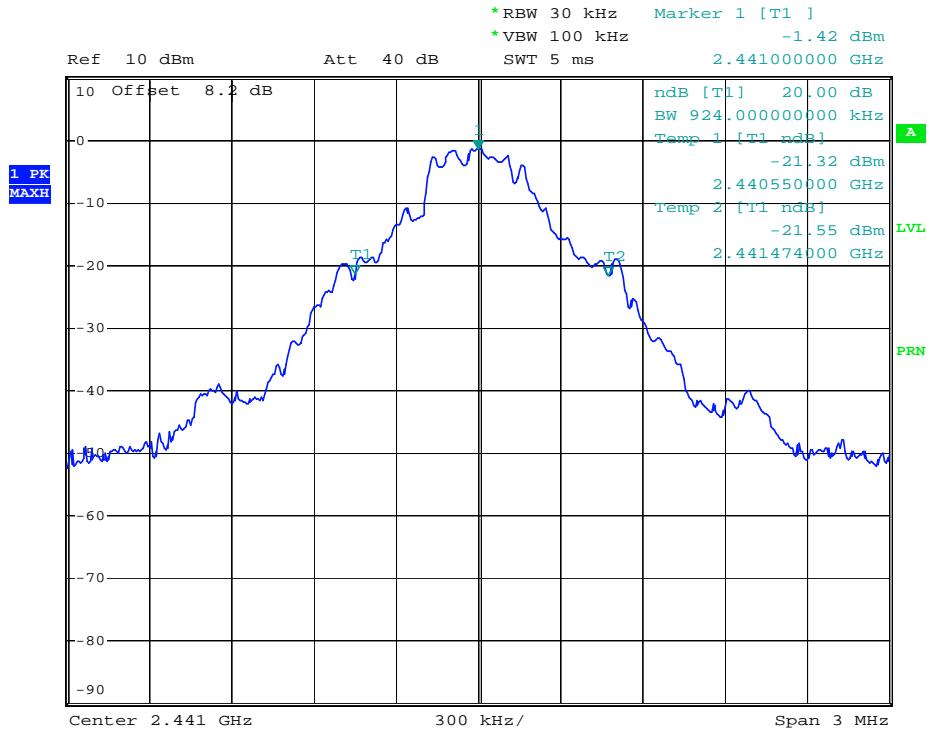
20 dB bandwidth

(Low CH)

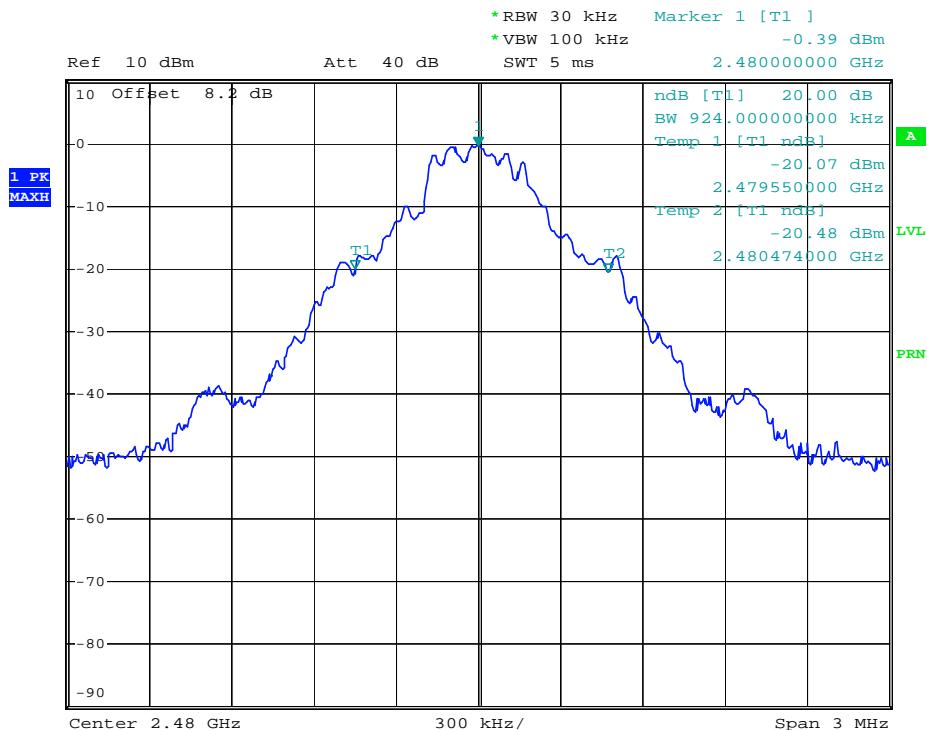


Date: 25.OCT.2007 11:40:47

HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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(Mid CH)


Date: 25.OCT.2007 10:46:36

(High CH)


Date: 25.OCT.2007 10:48:18

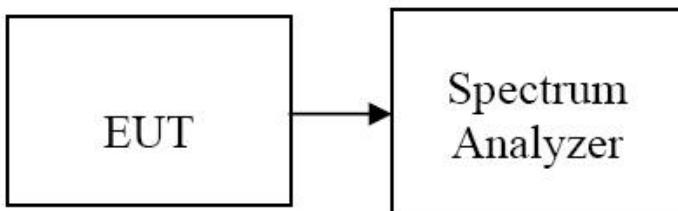
HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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7.4 NUMBER OF HOPPING FREQUENCY

LIMIT

According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Configuration



TEST PROCEDURE

The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer was set to :

1. Span = the frequency band of operation (Start = 2400 MHz, Stop = 2483.5 MHz)
2. RBW = 300 KHz
3. VBW = 300 KHz
4. Sweep = auto

The trace was allowed to stabilize.

TEST RESULTS

No non-compliance noted

Test Data

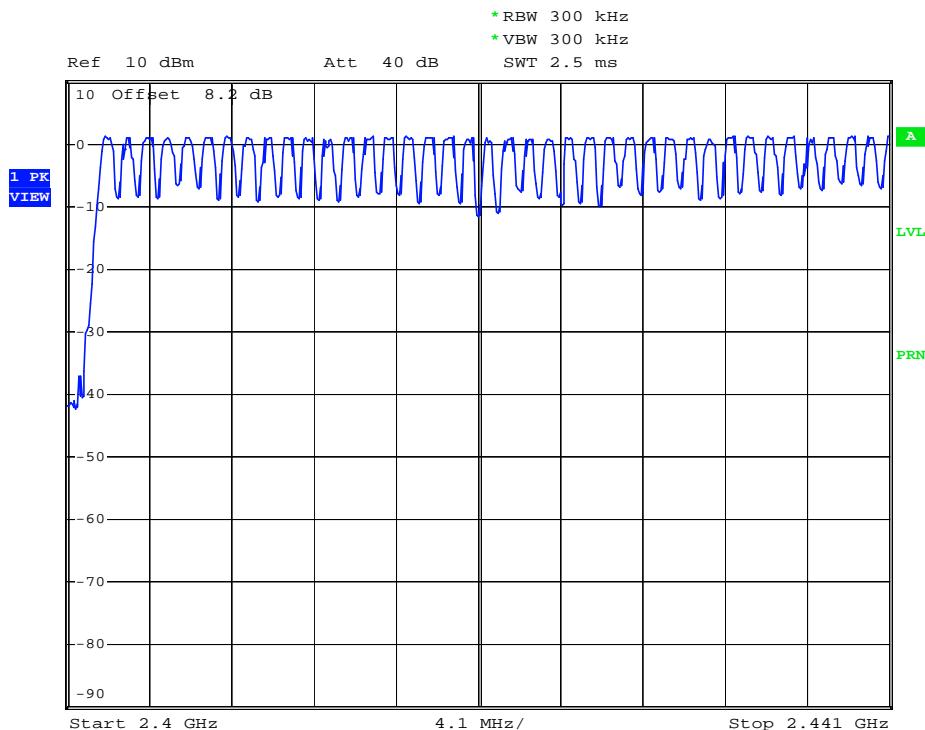
Result (No. of CH)	Limit (No. of CH)	Result
79	>75	Pass

HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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Test Plot

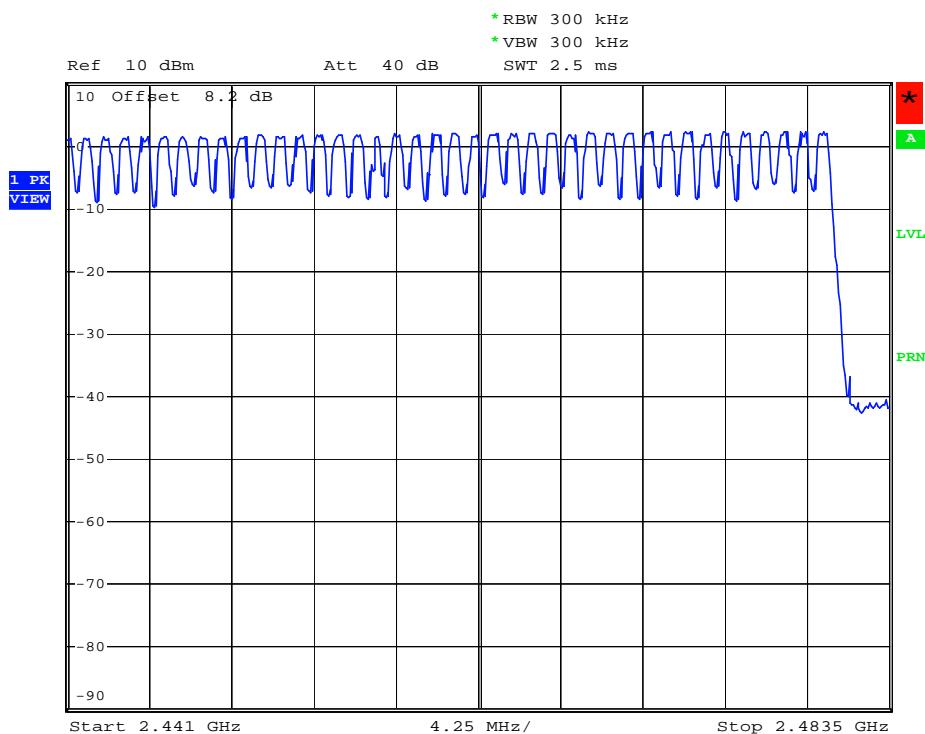
Number of Channels

2.4 GHz – 2.441 GHz



Date: 25.OCT.2007 10:50:59

2.441 GHz – 2.4835 GHz



Date: 25.OCT.2007 10:52:27

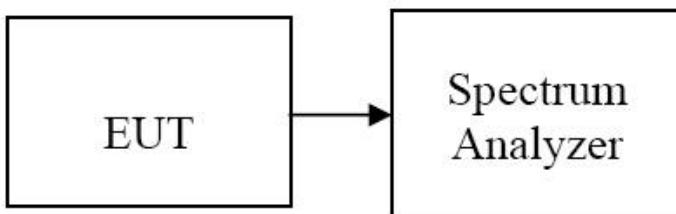
HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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7.5 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400 MHz ~ 2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

Test Configuration



TEST PROCEDURE

EUT was set to transmit the longest packet type (DH5)

1. Span = zero span
2. RBW = 1 MHz
3. VBW = 3 MHz
4. Sweep = as necessary to capture the entire dwell time per channel

The marker-delta function was used to determine the dwell time.

TEST RESULTS

See the table.

DH 5(The longest packet type)

$$\text{CH Low : } 2.889 * (1600/6)/79 * 31.6 = 308.16 \text{ (ms)}$$

$$\text{CH Mid : } 2.906 * (1600/6)/79 * 31.6 = 309.97 \text{ (ms)}$$

$$\text{CH High : } 2.889 * (1600/6)/79 * 31.6 = 308.16 \text{ (ms)}$$

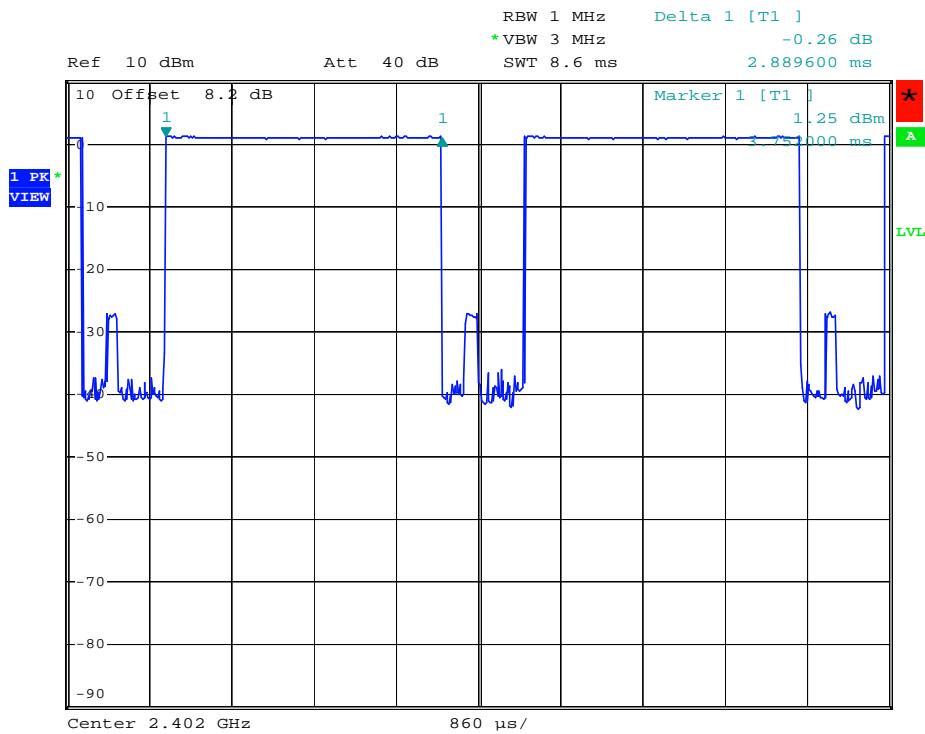
Channel	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	2.889	308.16	31.6	400	PASS
Mid	2.906	309.97	31.6		PASS
High	2.889	308.16	31.6		PASS

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Test Plots

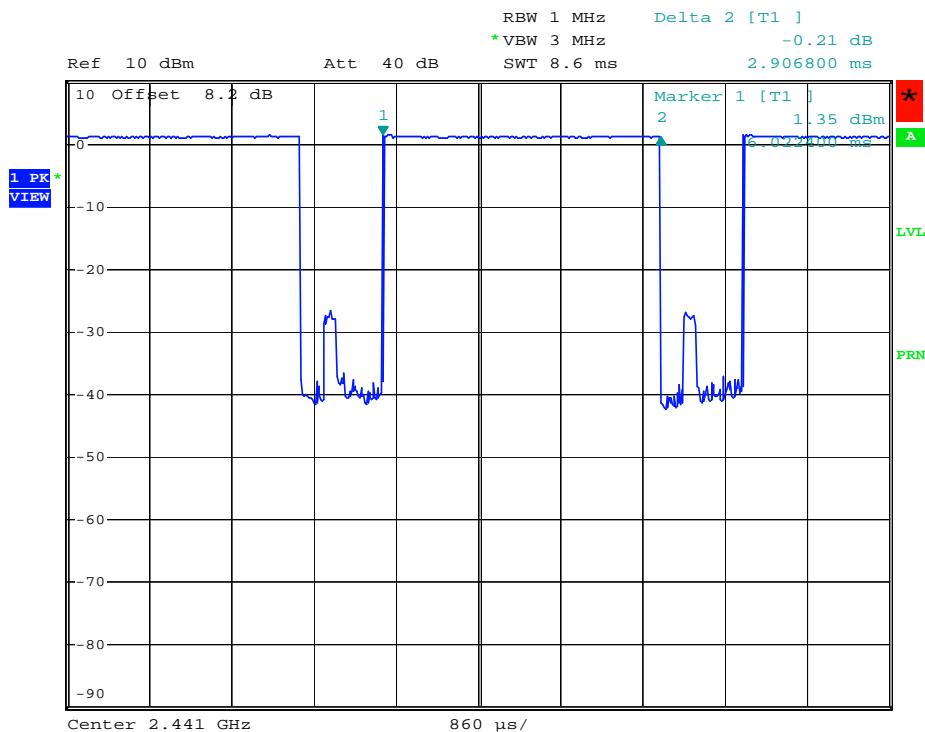
DH 5

(Low CH)



Date: 25.OCT.2007 10:58:51

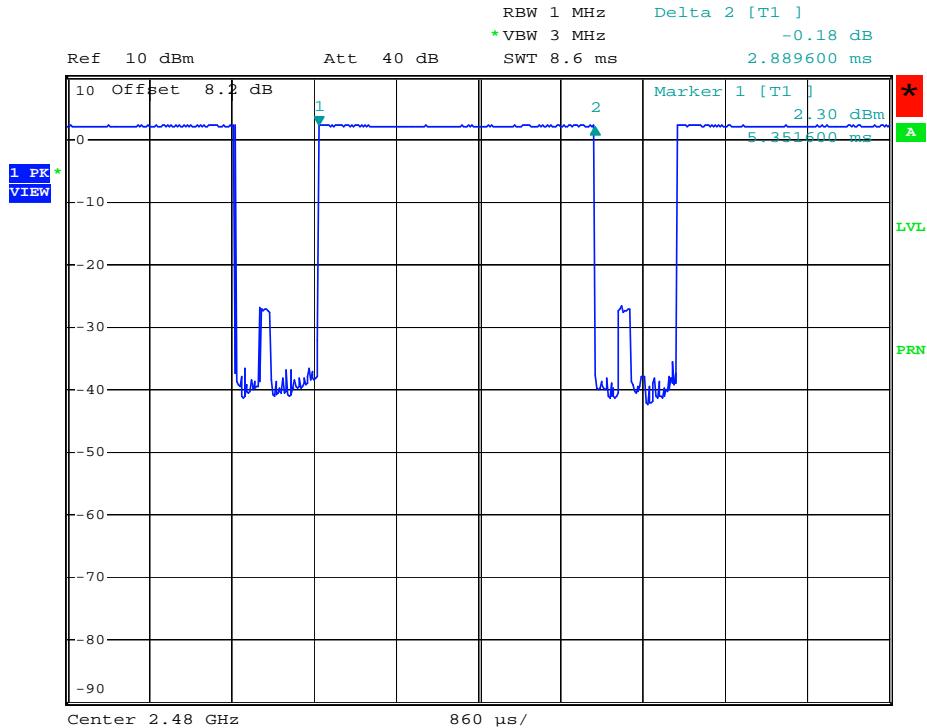
(Mid CH)



Date: 25.OCT.2007 11:04:59

HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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(CH High)



Date: 25.OCT.2007 11:05:59

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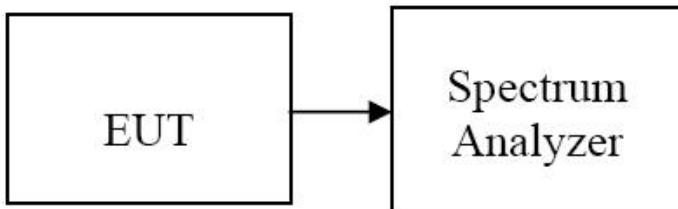
7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Spurious Measurement

LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator 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)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.

Measurements are made over the 30 MHz to 26 GHz range with the transmitter set to the lowest, middle, and highest channels.

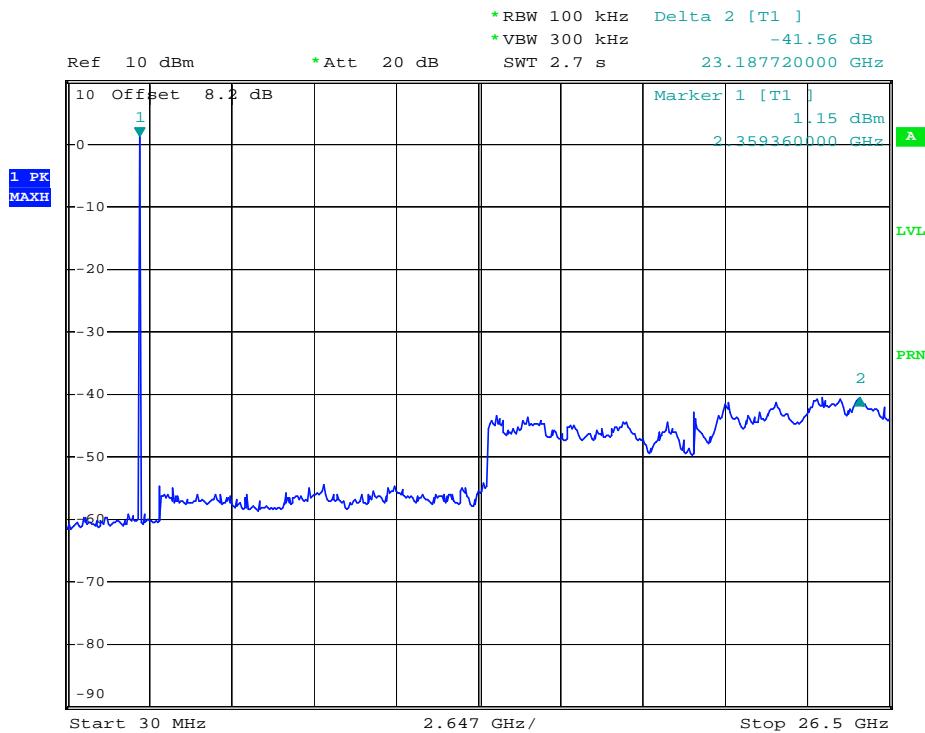
TEST RESULTS

No non-compliance noted

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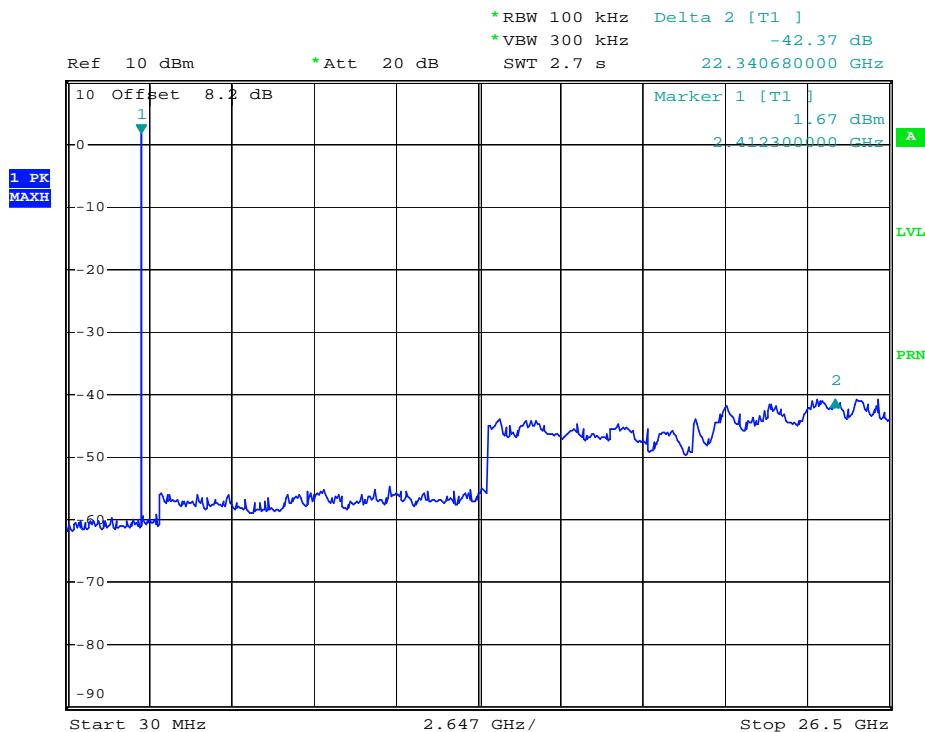
Test Plots

(Low CH)



Date: 25.OCT.2007 11:15:41

(Mid CH)

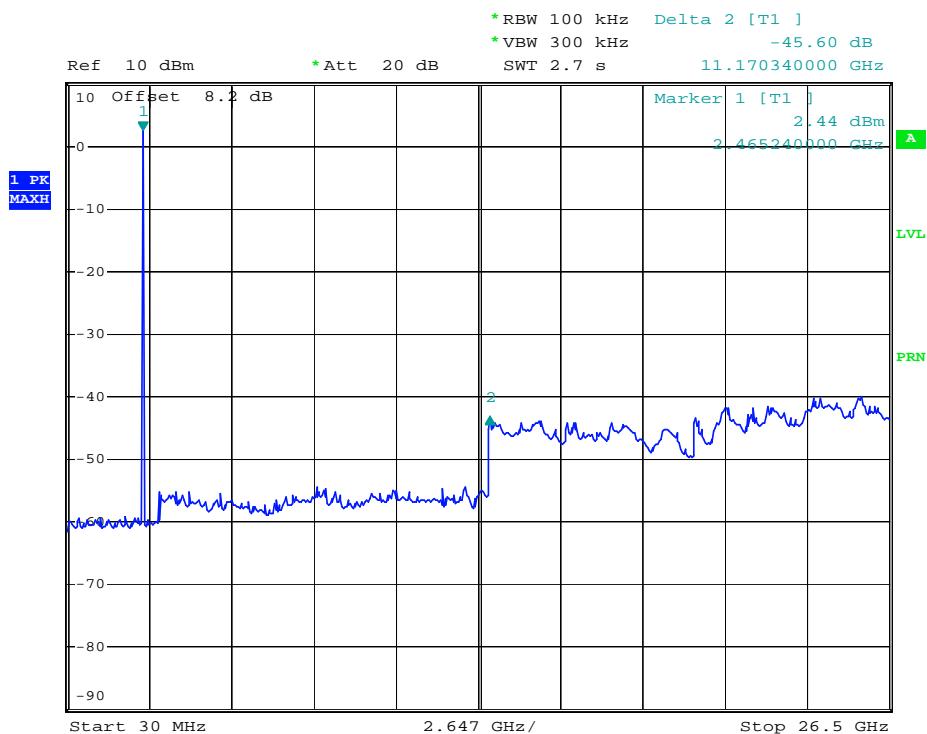


Date: 25.OCT.2007 11:17:13

HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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(High CH)



Date: 25.OCT.2007 11:19:33

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7.6.2 Radiated Spurious Emissions

LIMIT

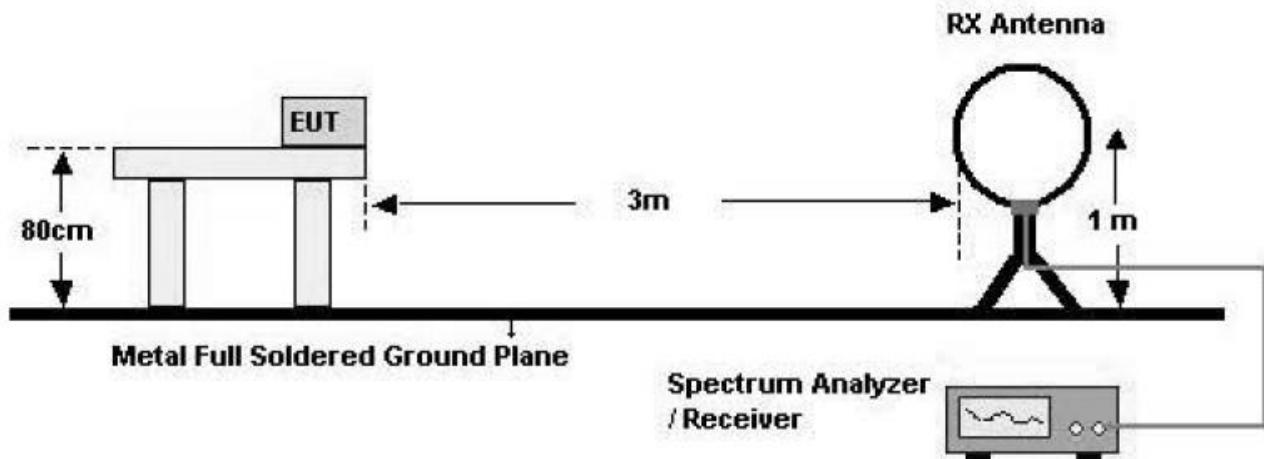
1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

Frequency (MHz)	Field Strength (mV/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

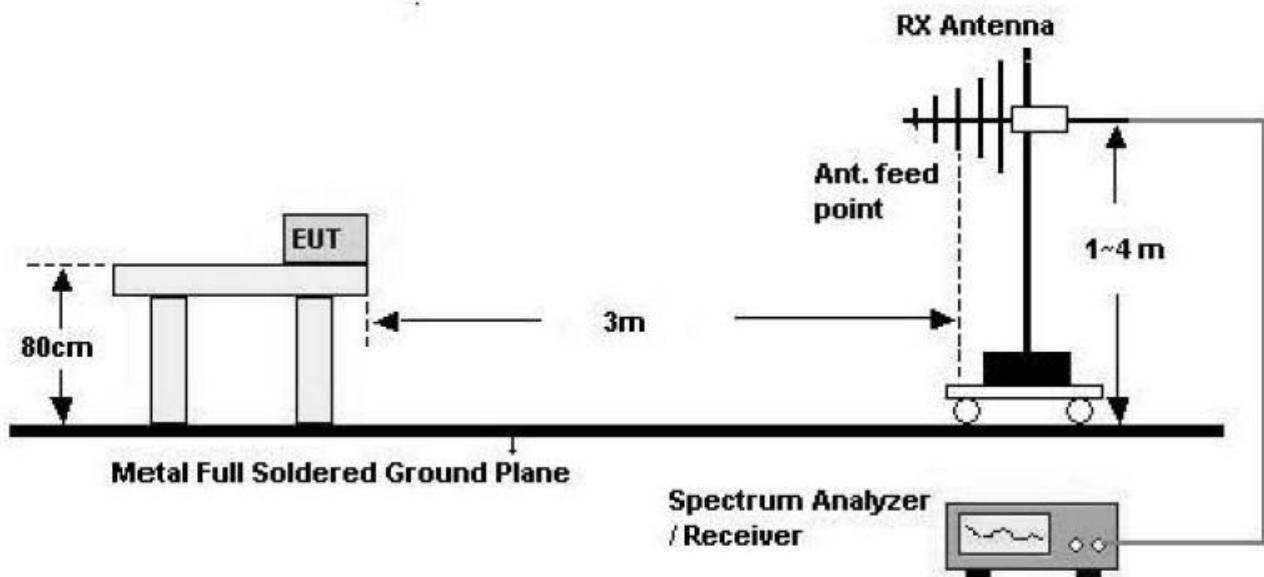
HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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Test Configuration

Below 30 MHz

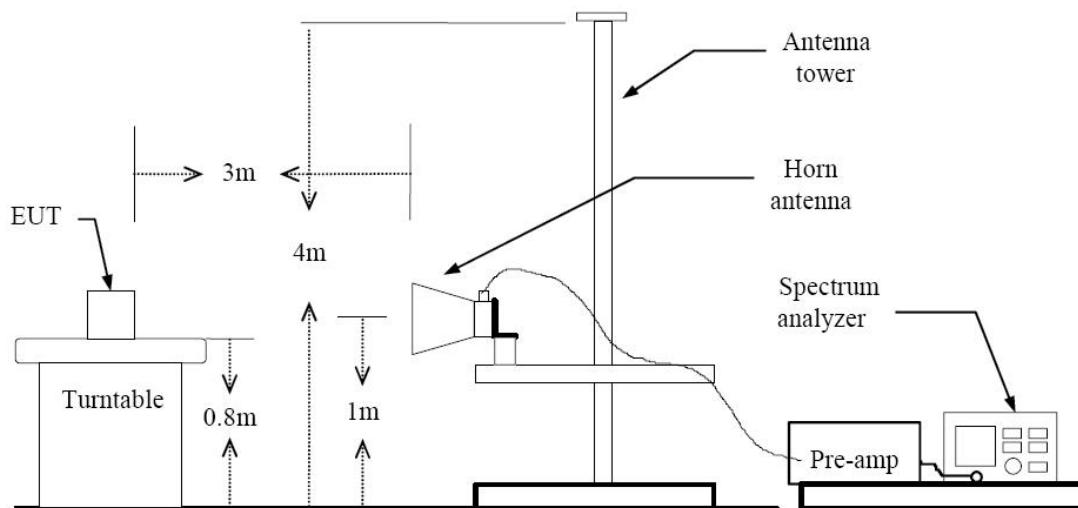


30 MHz - 1 GHz



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Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

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TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Link (Standard and Extended Battery)

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 = $40 \log (\text{specific distance} / \text{test distance})$ (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor

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TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link (Standard Battery)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
147.00	13.2	12.9	2.9	V	28.9	43.5	14.6
236.00	15.0	10.8	3.7	V	29.4	46.0	16.6
257.00	16.3	11.3	3.9	V	31.4	46.0	14.6
314.00	16.5	13.0	4.3	V	33.8	46.0	12.2

Operation Mode: Normal Link (Extended Battery)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
74	12.29	9.12	1.99	V	23.40	40.0	16.6
147	10.77	12.87	2.87	V	26.50	43.5	17.0
223	12.17	10.15	3.58	V	25.90	46.0	20.1

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Quasi peak detector mode.

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Above 1 GHz

Operation Mode: CH Low (Standard Battery)

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	-122.69	34.90	V	50.59	74	23.41	PK
4804	-109.8	34.90	V	37.70	54	16.30	AV
9608	-120.84	44.08	V	57.92	74	16.08	PK
9608	-107.71	44.08	V	44.79	54	9.21	AV

Operation Mode: CH Low (Extended Battery)

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	-118.55	34.90	V	46.45	74	27.55	PK
4804	-103.52	34.90	V	31.42	54	22.58	AV
9608	-118.15	44.08	V	55.23	74	18.77	PK
9608	-102.18	44.08	V	39.26	54	14.74	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. Spectrum setting:
 - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

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**Operation Mode: CH Mid (Standard Battery)**

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4882	-123.23	35.10	V	51.33	74	22.67	PK
4882	-110.68	35.10	V	38.78	54	15.22	AV
9764	-121.54	44.49	V	59.03	74	14.97	PK
9764	-108.20	44.49	V	45.69	54	8.31	AV

Operation Mode: CH Mid (Extended Battery)

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4882	-119.10	35.10	V	47.20	74	26.80	PK
4882	-104.88	35.10	V	32.98	54	21.02	AV
9764	-119.53	44.49	V	57.02	74	16.98	PK
9764	-102.18	44.49	V	39.67	54	14.33	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 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

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**Operation Mode: CH High (Standard Battery)**

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	-122.65	35.30	V	50.95	74	23.05	PK
4960	-110.17	35.30	V	38.47	54	15.53	AV
9920	-121.95	44.89	V	59.84	74	14.16	PK
9920	-108.33	44.89	V	46.22	54	7.78	AV

Operation Mode: CH High (Extended Battery)

Frequency [MHz]	Level [dBm]	AN. CL. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	-119.24	35.30	V	47.54	74	26.46	PK
4960	-103.56	35.30	V	31.86	54	22.14	AV
9920	-118.82	44.89	V	56.71	74	17.29	PK
9920	-102.17	44.89	V	40.06	54	13.94	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 > 20dB 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. Spectrum setting:
 - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
 - b. AV Setting 1 GHz- 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

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7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

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 microvolt (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 (dB μ V)	
	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.

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Test Plot (Standard Battery)

Conducted emissions (Line 1 / Mid CH)

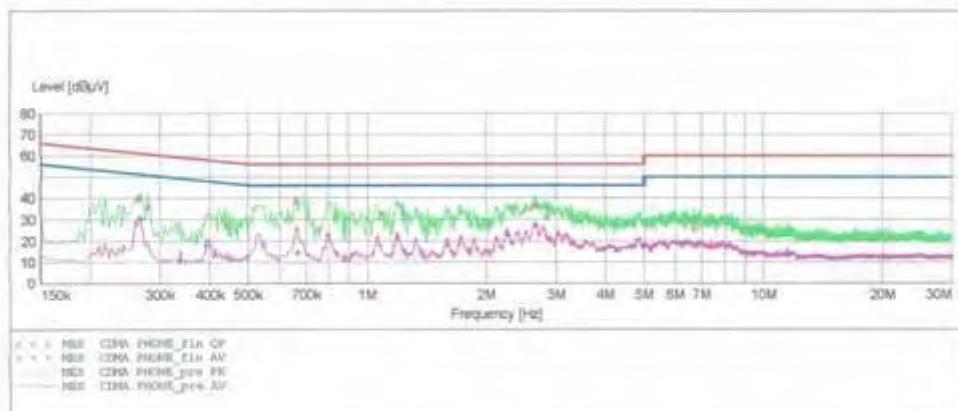
HCT

EMC TEST LAB.

EUT: RM-347
 Manufacturer: FINTK
 Operating Condition: BLUETOOTH MODE
 Test Site: SHEILD ROOM
 Operator: DH-RYU
 Test Specification: CISPR 22 CLASS B
 Comment: H

SCAN TABLE: "CISPR 22 Voltage"

CISPR 22 Voltage						
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "CDMA PHONE_fin QP"

10/25/2007 7:46PM	Frequency	Level	Transd	Limit	Margin	Line	PE
	MHz	dBµV	dB	dBµV	dB		
	0.265100	40.60	10.0	61	20.7	---	---
	0.280100	36.30	10.0	61	24.6	---	---
	0.440100	27.60	10.0	57	29.5	---	---
	0.660000	39.00	10.1	56	17.0	---	---
	2.655000	37.00	10.4	56	19.0	---	---
	2.830000	31.80	10.4	56	24.2	---	---
	6.370000	27.70	10.8	60	32.3	---	---
	6.670000	25.90	10.8	60	34.1	---	---
	6.895000	27.20	10.9	60	32.8	---	---

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MEASUREMENT RESULT: "CDMA PHONE fin AV"

10/25/2007 7:46PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.267600	30.90	10.0	51	20.3	---	---
0.337600	10.90	10.0	49	38.4	---	---
0.392600	18.30	10.0	48	29.7	---	---
0.665000	14.70	10.1	46	31.3	---	---
2.260000	23.10	10.3	46	22.9	---	---
2.660000	28.00	10.4	46	18.0	---	---
5.000000	18.30	10.6	46	27.7	---	---
6.400000	19.40	10.8	50	30.6	---	---
11.470000	13.00	11.3	50	37.0	---	---

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Conducted emissions (Line 2 / Mid CH)

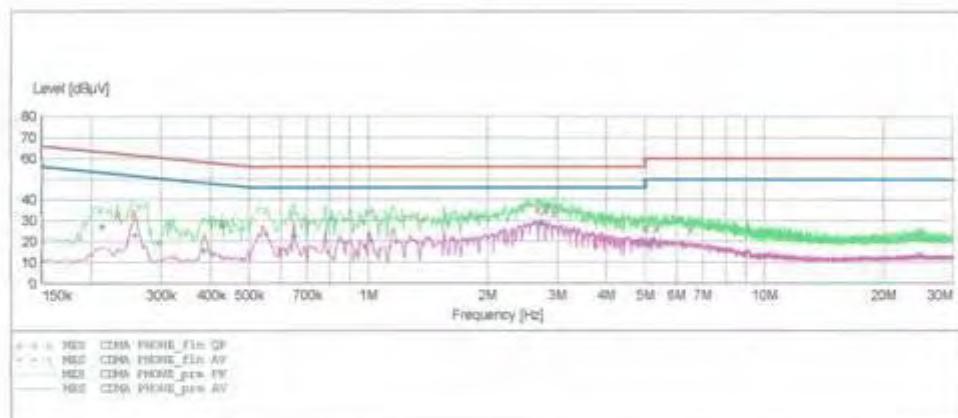
HCT

EMC TEST LAB.

EUT: RM-347
 Manufacturer: FIHTEK
 Operating Condition: BLUETOOTH MODE
 Test Site: SHEILD ROOM
 Operator: DH-RYU
 Test Specification: CISPR 22 CLASS B
 Comment: N

SCAN TABLE: "CISPR 22 Voltage"

CISPR 22 Voltage						
Start	Stop	Step	Detector	Meas.	IF	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "CDMA PHONE_fin QP"

10/25/2007 7:42PM	Frequency	Level	Transd	Limit	Margin	Line	PE
	MHz	dBuV	dB	dBuV	dB		
	0.232600	32.90	10.0	62	29.4	---	---
	0.255100	33.90	10.0	62	27.7	---	---
	0.427600	28.40	10.0	57	28.9	---	---
	2.670000	35.40	10.4	56	20.6	---	---
	2.780000	35.00	10.4	56	21.0	---	---
	2.930000	33.70	10.4	56	22.3	---	---
	5.000000	26.40	10.6	56	29.6	---	---
	5.335000	26.00	10.7	60	34.0	---	---
	6.490000	25.40	10.8	60	34.6	---	---

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MEASUREMENT RESULT: "CDMA PHONE fin AV"

10/25/2007 7:42PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.212600	27.00	10.0	53	26.1	---	---
0.257600	23.20	10.0	52	28.3	---	---
0.385100	15.60	10.0	48	32.6	---	---
0.650000	22.60	10.1	46	23.4	---	---
2.635000	28.90	10.4	46	17.1	---	---
2.715000	28.20	10.4	46	17.8	---	---
5.000000	18.50	10.6	46	27.5	---	---
5.170000	18.90	10.6	50	31.1	---	---
5.280000	19.70	10.7	50	30.3	---	---

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Test Plot (Extended Battery)

Conducted emissions (Line 1 / Mid CH)

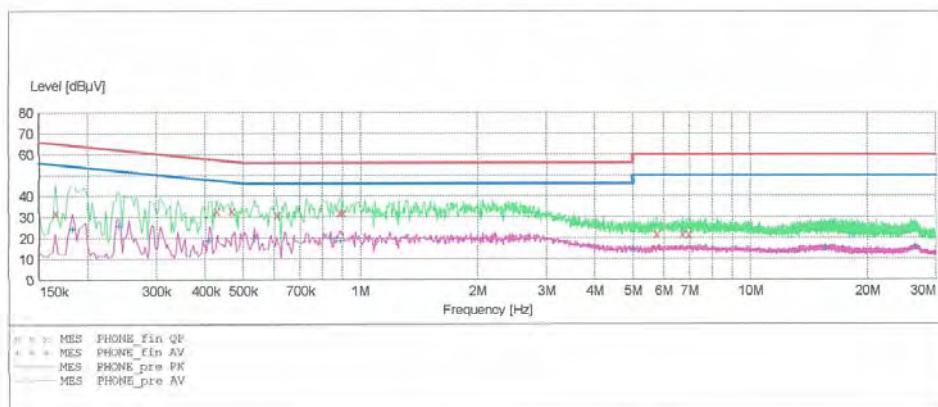
HCT

EMC TEST LAB.

EUT: RM-347
 Manufacturer: FIHTEK
 Operating Condition: BLUETOOTH MODE
 Test Site: SHIELD ROOM
 Operator: YS-JUNG
 Test Specification: CISPR 22 CLASS B
 Comment: N

SCAN TABLE: "CISPR 22 Voltage"

CISPR 22 Voltage						
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin_QP"

11/13/2007 9:18AM	Frequency	Level	Transd	Limit	Margin	Line	PE
	MHz	dBuV	dB	dBuV	dB		
	0.165100	32.10	10.0	65	33.1	---	---
	0.427600	33.20	10.0	57	24.1	---	---
	0.467600	33.20	10.1	57	23.3	---	---
	0.610000	31.20	10.1	56	24.8	---	---
	0.885000	32.50	10.1	56	23.5	---	---
	0.900000	32.50	10.1	56	23.5	---	---
	5.765000	21.80	10.7	60	38.2	---	---
	6.710000	21.90	10.8	60	38.1	---	---
	6.955000	21.70	10.9	60	38.3	---	---

HCT PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2007 9:18AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.182600	24.80	10.0	54	29.6	---	---
0.240100	26.20	10.0	52	25.9	---	---
0.410100	19.20	10.0	48	28.4	---	---
0.535000	20.10	10.1	46	25.9	---	---
0.840000	20.10	10.1	46	25.9	---	---
0.890000	18.80	10.1	46	27.2	---	---
5.000000	14.20	10.6	46	31.8	---	---
15.585000	15.10	12.0	50	34.9	---	---
26.555000	15.80	12.7	50	34.2	---	---

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Conducted emissions (Line 2 / Mid CH)

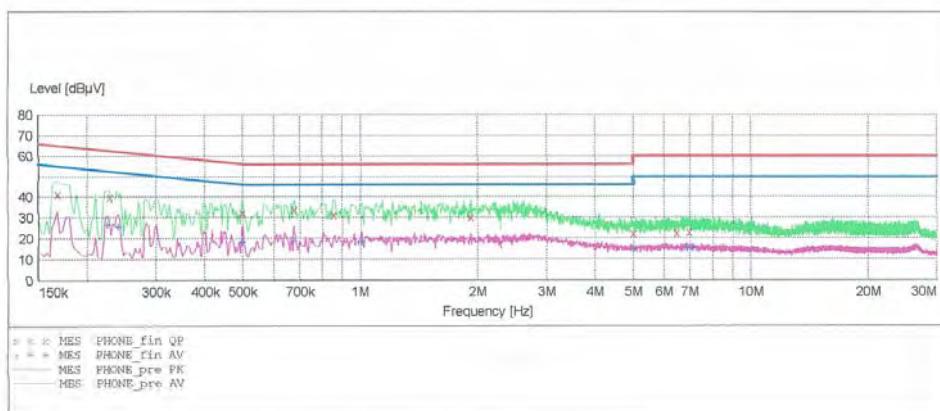
HCT

EMC TEST LAB.

EUT: RM-347
 Manufacturer: FIHTK
 Operating Condition: BLUETOOTH MODE
 Test Site: SHIELD ROOM
 Operator: YS-JUNG
 Test Specification: CISPR 22 CLASS B
 Comment: H

SCAN TABLE: "CISPR 22 Voltage"

Short Description: CISPR 22 Voltage
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.1 kHz 500.0 kHz 2.5 kHz MaxPeak 10.0 ms 9 kHz None
 Average
 500.0 kHz 5.0 MHz 5.0 kHz MaxPeak 10.0 ms 9 kHz None
 Average
 5.0 MHz 30.0 MHz 5.0 kHz MaxPeak 10.0 ms 9 kHz None
 Average



MEASUREMENT RESULT: "PHONE_fin_QP"

11/13/2007 9:15AM	Frequency	Level	Transd	Limit	Margin	Line	PE
	MHz	dB μ V	dB	dB μ V	dB		
	0.167600	41.60	10.0	65	23.5	---	---
	0.227600	40.00	10.0	63	22.5	---	---
	0.497600	32.50	10.1	56	23.5	---	---
	0.675000	34.00	10.1	56	22.0	---	---
	0.855000	31.60	10.1	56	24.4	---	---
	1.920000	30.40	10.3	56	25.6	---	---
	5.000000	22.40	10.6	56	33.6	---	---
	6.455000	22.60	10.8	60	37.4	---	---
	6.960000	23.00	10.9	60	37.0	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2007 9:15AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line ---	PE ---
0.225100	26.90	10.0	53	25.7	---	---
0.240100	25.80	10.0	52	26.3	---	---
0.497600	18.30	10.1	46	27.8	---	---
0.500000	18.40	10.1	46	27.6	---	---
0.675000	18.90	10.1	46	27.1	---	---
1.010000	18.50	10.1	46	27.5	---	---
5.000000	14.70	10.6	46	31.3	---	---
6.865000	15.50	10.9	50	34.5	---	---
7.110000	15.40	10.9	50	34.6	---	---

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8. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Cal Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESCI/ EMI Test Receiver	08/24/ 2007	Annual	08/24/ 2008	100033
Rohde & Schwarz	ESH2-Z5/ LISN	04/20/2007	Annual	04/20/2008	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	04/11/2007	Annual	03/16/2008	837950/023
Schwarzbeck	VULB 9160/ TRILOG Antenna	04/20/2007	Annual	04/20/2008	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	03/16/2007	Annual	03/16/2008	375.8810.352
MITEQ	AMF-60-0010 1800-35-20P	01/24/2007	Annual	01/24/2008	1200937
MITEQ	AMF-6D-01180-35-20P	02/24/2007	Annual	02/24/2008	990893
Schwarzbeck	BBHA 9120D/ Horn Antenna	03/30/2007	Annual	03/30/2008	147
Schwarzbeck	BBHA9170/ SHF-EHF Horn Antenna	03/20/2007	Annual	03/20/2008	BBHA9170342
Rohde & Schwarz	HFH2-Z2/Loop Antenna	05/11/2007	Annual	01/10/2008	881056/070
Rohde & Schwarz	FSP30/Spectrum Analyzer	06/28/2007	Annual	06/28/2008	839117/011
Agilent	E4416A /Power Meter	01/22/2007	Annual	01/22/2008	GB41291412
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	06/28/2007	Annual	06/28/2008	1
Weinschel	1506A/Power Divider	02/06/2007	Annual	02/06/2008	MD793
DIGITAL	EP-3010 /DC POWER SUPPLY	12/29/2006	Annual	12/29/2008	3110117

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