



HCT CO., LTD.

Product Compliance Division

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CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name:

CASIO HITACHI Mobile Communications Co., Ltd.
2-229-1, Sakuragaoka, Higashiyamato-shi, Tokyo
207-8501, Japan

Date of Issue:

July 17, 2009

Location:

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

Test Report No.: HCT-RF09-0717

HCT FRN: 0005866421

IC Recognition No.: IC 5944A-1

FCC ID: **TYKNX9290**

APPLICANT: **CASIO HITACHI Mobile Communications Co., Ltd.**

Model(s): C741

EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth

Max. RF Output Power: GFSK : -0.18 dBm(0.96 mW) , EDR : -0.53 dBm(0.89 mW)

Frequency Range: 2402 - 2480 MHz (Bluetooth)

Modulation type: GFSK, PSK

FCC Classification: FCC Part 15 Frequency Hopping Spread Spectrum Transceiver

FCC Rule Part(s): Part 15 subpart C 15.247

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. 862

Hyo Sun Kwak

Report prepared by

: Hyo Sun Kwak

Test engineer of RF Team

Sang Jun Lee

Approved by

: Sang Jun Lee

Manager of RF Team

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

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| Test Report No. | | EUT Type: | FCC ID: | |
| HCT-RF09-0717 | July 17, 2009 | Dual-Band CDMA/EVDO Phone with Bluetooth | TYKNX9290 | |



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1. GENERAL INFORMATION

Applicant: CASIO HITACHI Mobile Communications Co., Ltd.
Address: 2-229-1, Sakuragaoka, Higashiyamato-shi, Tokyo 207-8501, Japan
FCC ID: TYKNX9290
EUT: Dual-Band CDMA/EVDO Phone with Bluetooth
Model: C741
Date of Test: July 02, 2009 ~ July 12, 2009
Contact person: Name: Toshikazu Higuchi
Phone #: +81-42-516-2183
Fax #: +81-42-516-2505

2. EUT DESCRIPTION

| | | |
|------------------------------|--|---|
| Product | | Dual-Band CDMA/EVDO Phone with Bluetooth |
| Model Name | | C741 |
| Power Supply | | DC 3.7 V |
| Battery | Model Name: Power Rating: Type: | BTR731B 3.7 V , 1440 mAh, 5.4 Wh Li-ion |
| Frequency Range | | 2402 ~ 2480 MHz |
| Transmit Power | | GFSK : -0.18 dBm(0.96 mW) , EDR : -0.53 dBm(0.89 mW) |
| Modulation Type | | GFSK(Normal), PSK(EDR) |
| Modulation Technique | | FHSS |
| Number of Channels | | 79 Channels |
| Antenna Specification | | Manufacturer: Tyco Electronics Antenna type: Internal Antenna AVE Gain : -8.0 dBi |

* 15.247 Requirements for Bluetooth transmitter.

- This Bluetooth module has been tested by a Bluetooth Qualification Lab, and we confirm the following:
 - 1) This system is hopping pseudorandomly.
 - 2) Each frequency is used equally on the average by each transmitter.
 - 3) The receiver input bandwidths that match the hopping channel bandwidths of their corresponding transmitters
 - 4) The receiver shifts frequencies in synchronization with the transmitted signals.
- 15.247(g): The system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this Section 15.247 should the transmitter be presented with a continuous data (or information) stream.
- 15.247(h): The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

| | | | |
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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 9 kHz to 40 GHz(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 **CASIO HITACHI Mobile Communications Co., Ltd.** **Dual-Band CDMA/EVDO Phone with Bluetooth FCC ID: TYKNX9290**

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.

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 June 10, 2009(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. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

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7. FCC PART 15.247 REQUIREMENTS

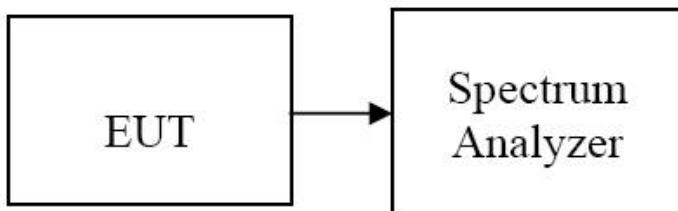
7.1 PEAK POWER

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 (GFSK) / 5 MHz (8DPSK)
2. RBW = 1 MHz (GFSK) / 3 MHz (8DPSK)
3. VBW = 1 MHz (GFSK) / 3 MHz (8DPSK)
4. Sweep = auto
5. Packet type= DH5 (GFSK) / 3-DH5 (8DPSK)

TEST RESULTS

No non-compliance noted

Test Data

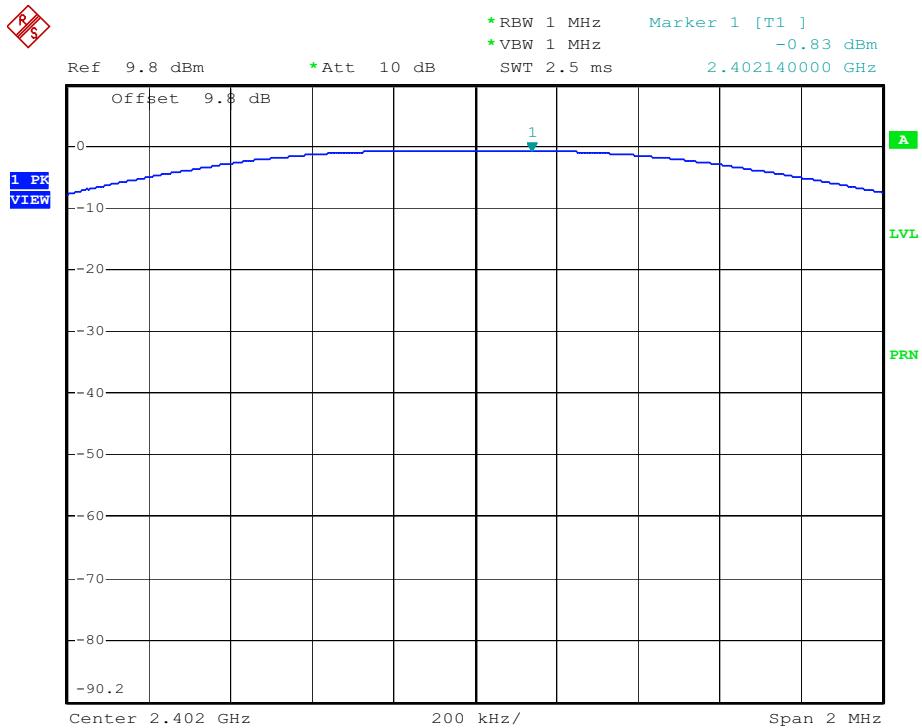
| Channel | Frequency (MHz) | Output Power(GFSK) | | Output Power(8DPSK) | | Limit (W) | Result |
|---------|--------------------|--------------------|------|---------------------|------|--------------|--------|
| | | (dBm) | (mW) | (dBm) | (mW) | | |
| Low | 2402 | -0.83 | 0.83 | -0.92 | 0.81 | 1 | PASS |
| Mid | 2441 | -0.31 | 0.93 | -0.53 | 0.89 | | PASS |
| High | 2480 | -0.18 | 0.96 | -0.74 | 0.84 | | PASS |

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Test Plots

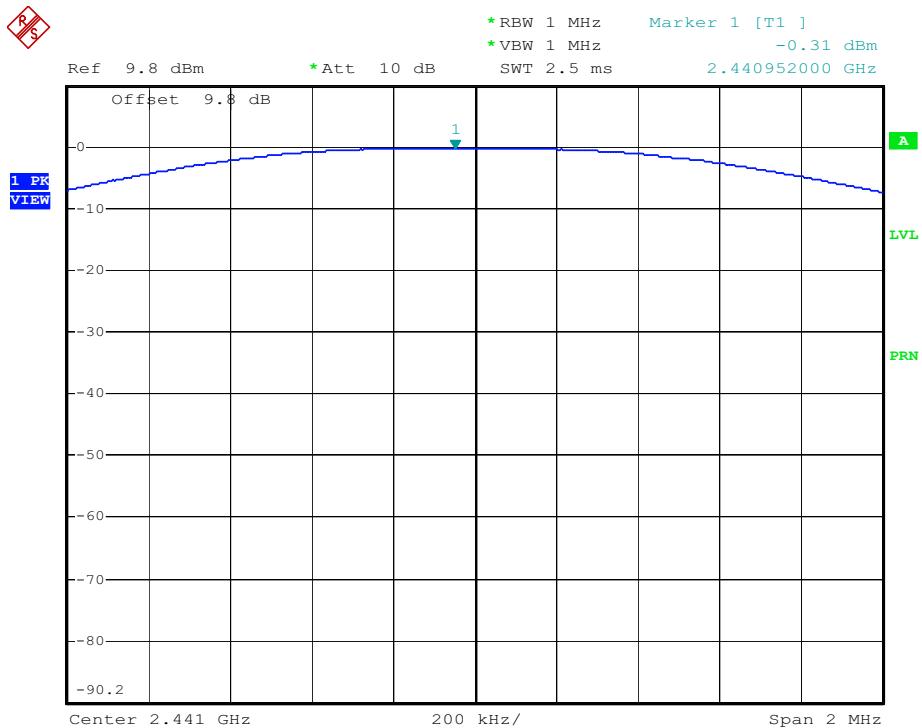
(GFSK)

Peak Power (Low CH)



Date: 12.JUL.2009 17:10:28

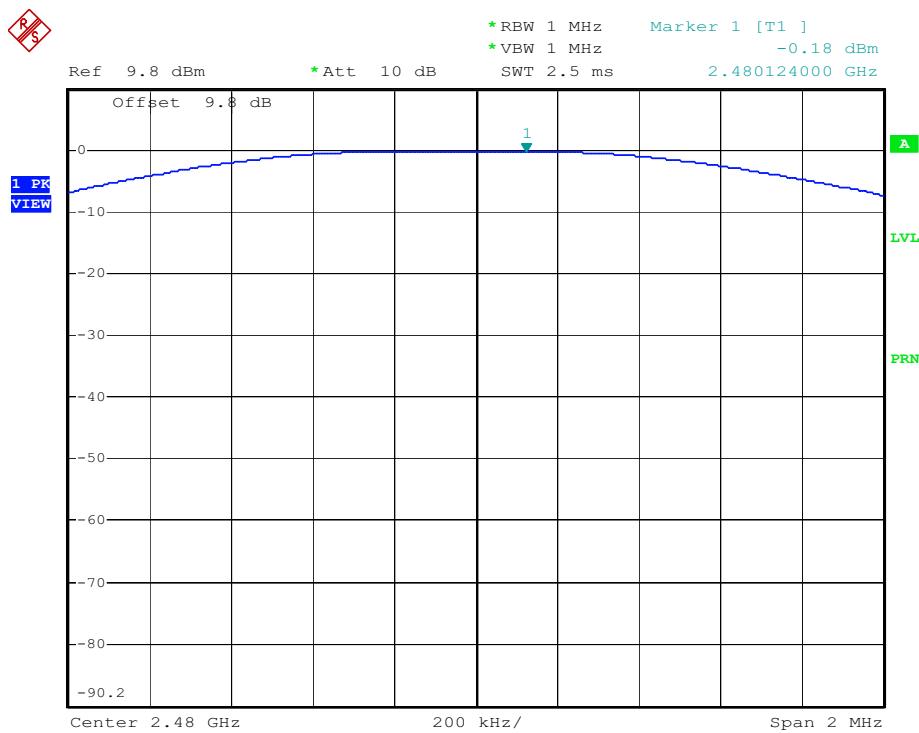
Peak Power (Mid CH)



Date: 12.JUL.2009 17:10:59

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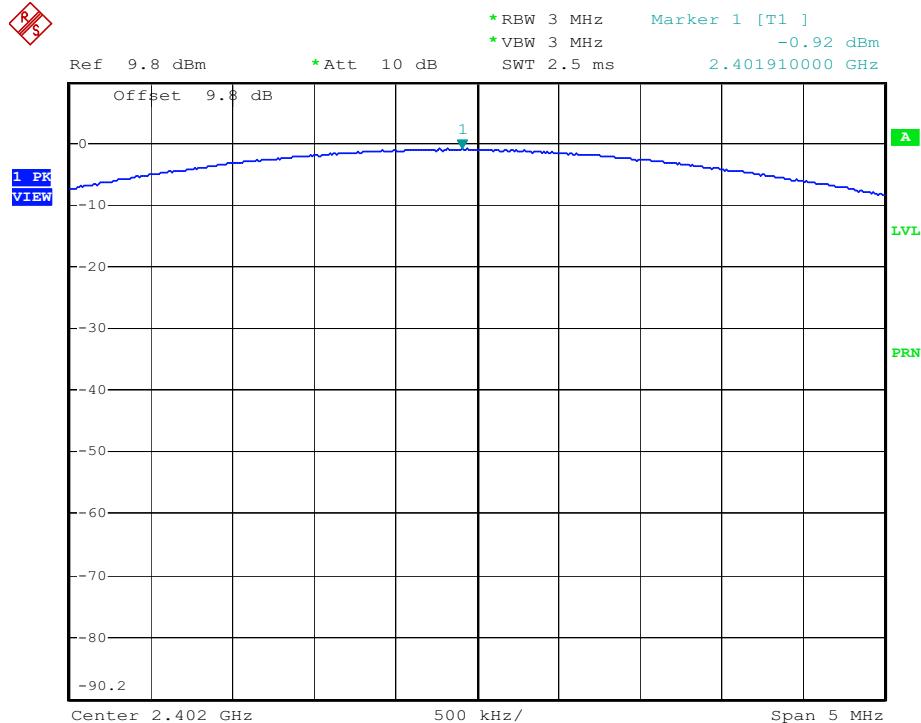
Peak Power (High CH)



Date: 12.JUL.2009 17:11:37

(8DPSK)

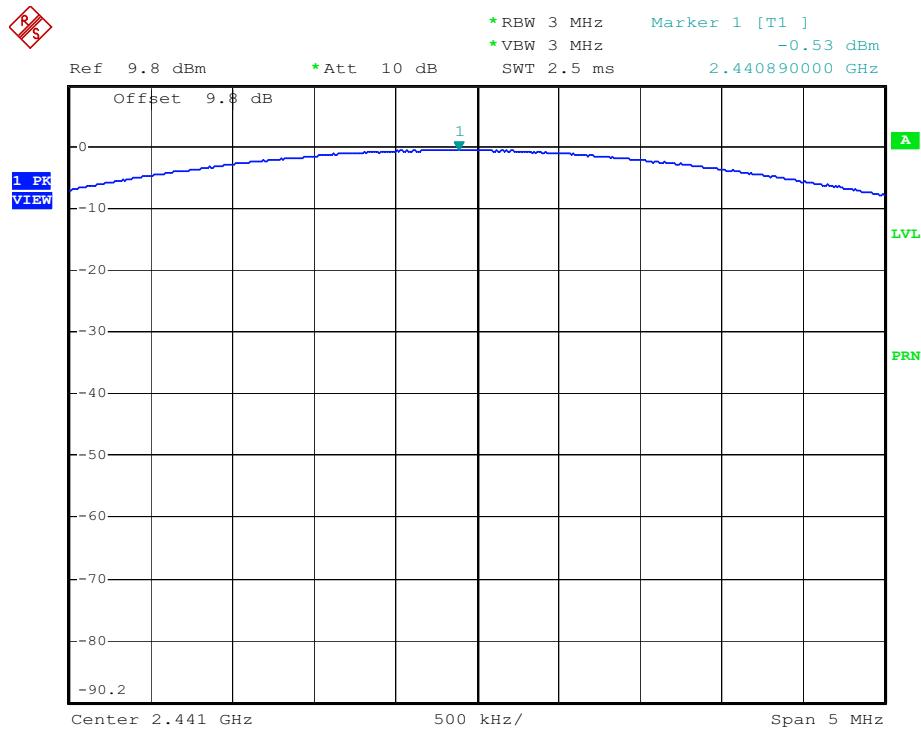
Peak Power (Low CH)



Date: 12.JUL.2009 17:12:29

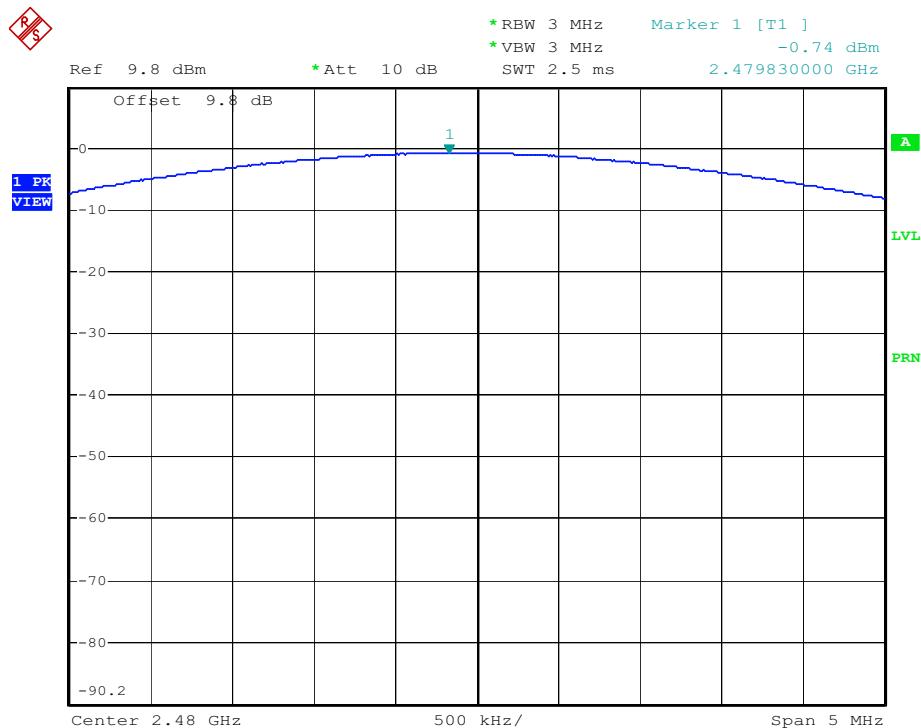
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Peak Power (Mid CH)



Date: 12.JUL.2009 17:12:58

Peak Power (High CH)



Date: 12.JUL.2009 17:13:28

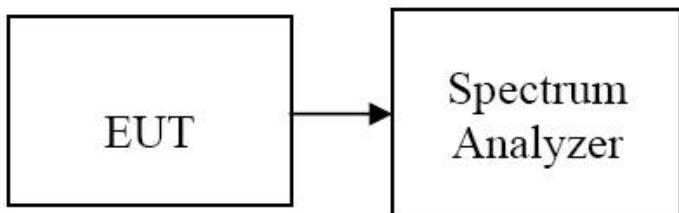
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7.2 BAND EDGES MEASUREMENT

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
5. Detector Mode = Peak

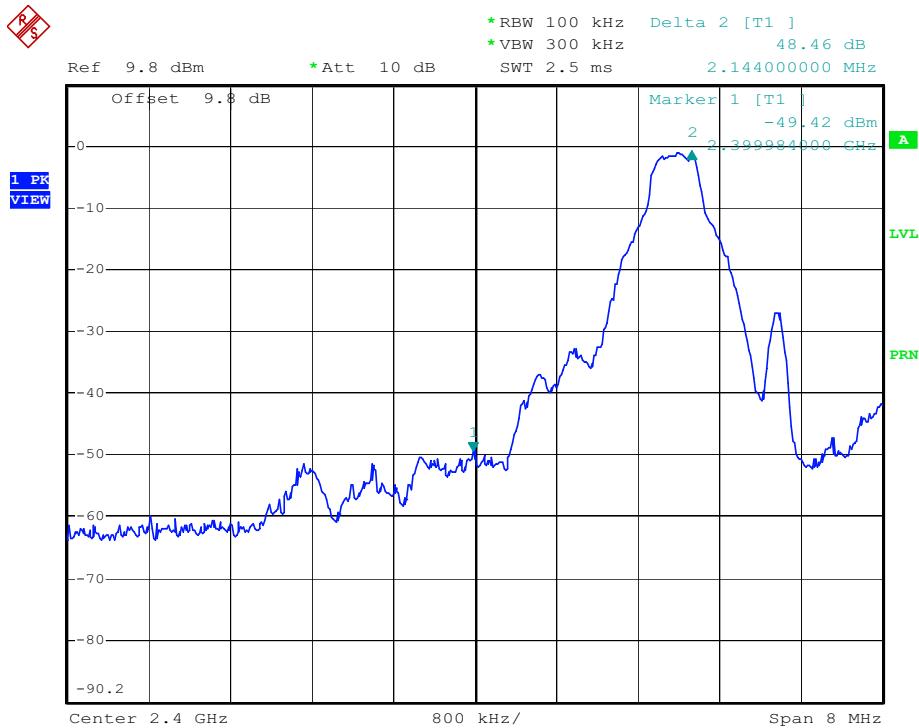
TEST RESULTS

See attached.

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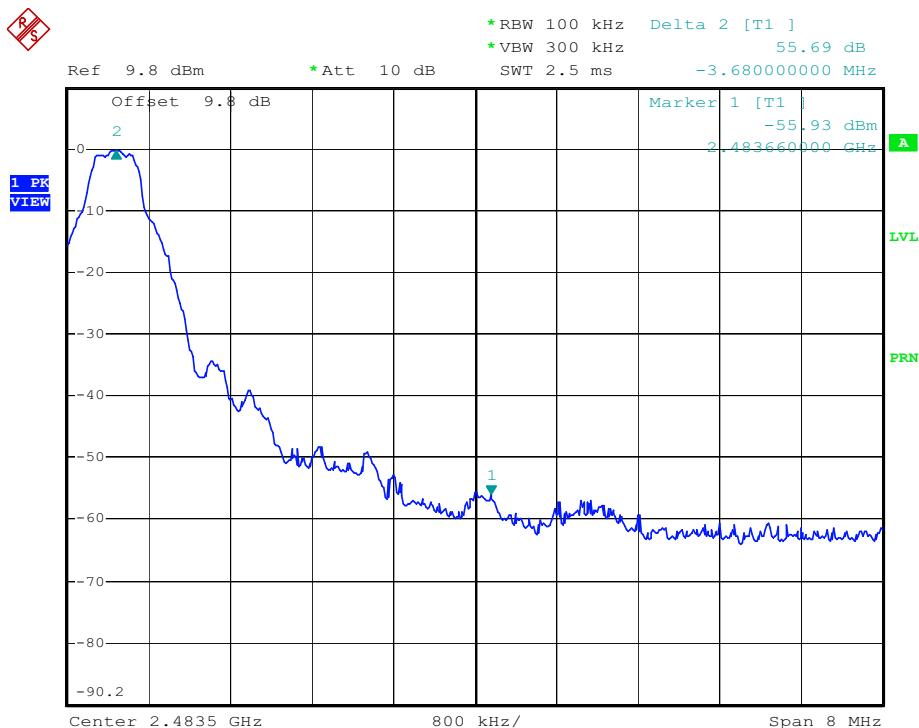
Test Data (GFSK)

Band Edges (Low-CH)



Date: 12.JUL.2009 17:14:28

Band Edges (High-CH)

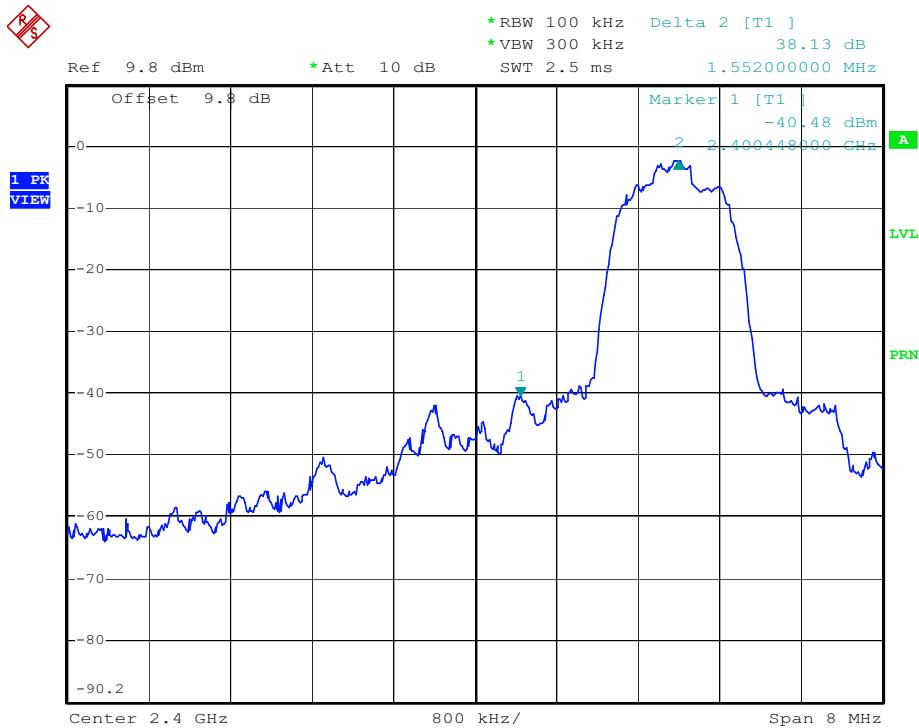


Date: 12.JUL.2009 17:15:13

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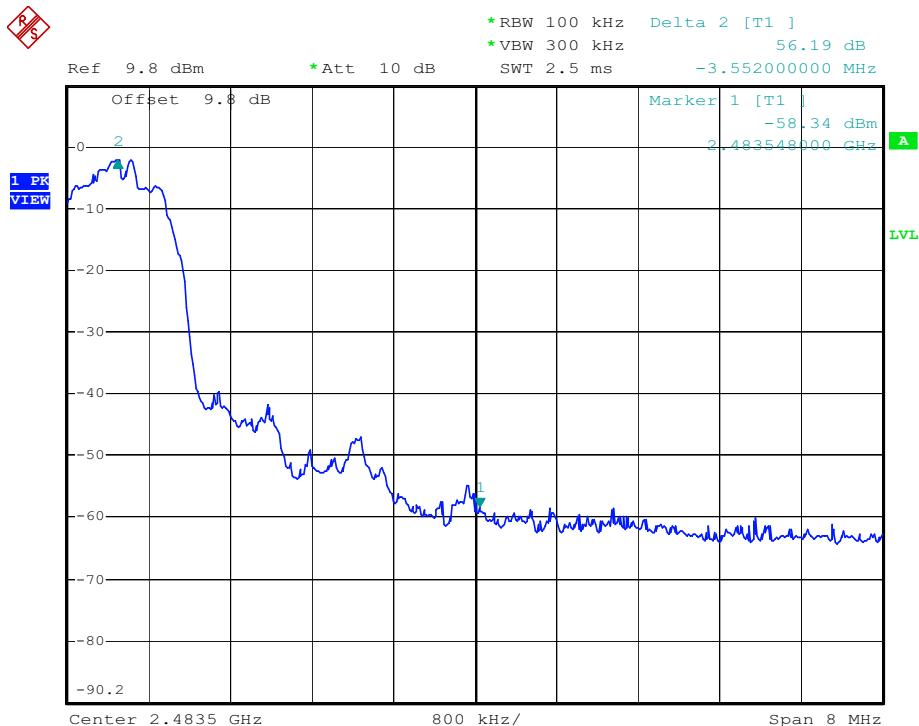
Test Data (8DPSK)

Band Edges (Low-CH)



Date: 12.JUL.2009 17:15:58

Band Edges (High-CH)



Date: 12.JUL.2009 17:16:59

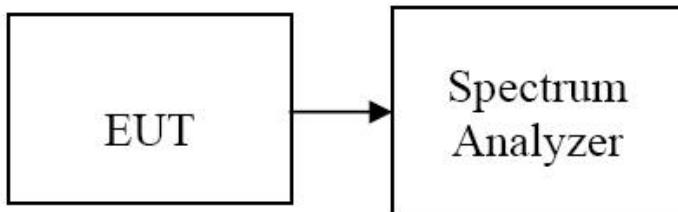
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7.3 FREQUENCY SEPARATION

LIMIT

According to §15.247(a)(1), Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of 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 = 30 kHz
3. VBW = 100 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

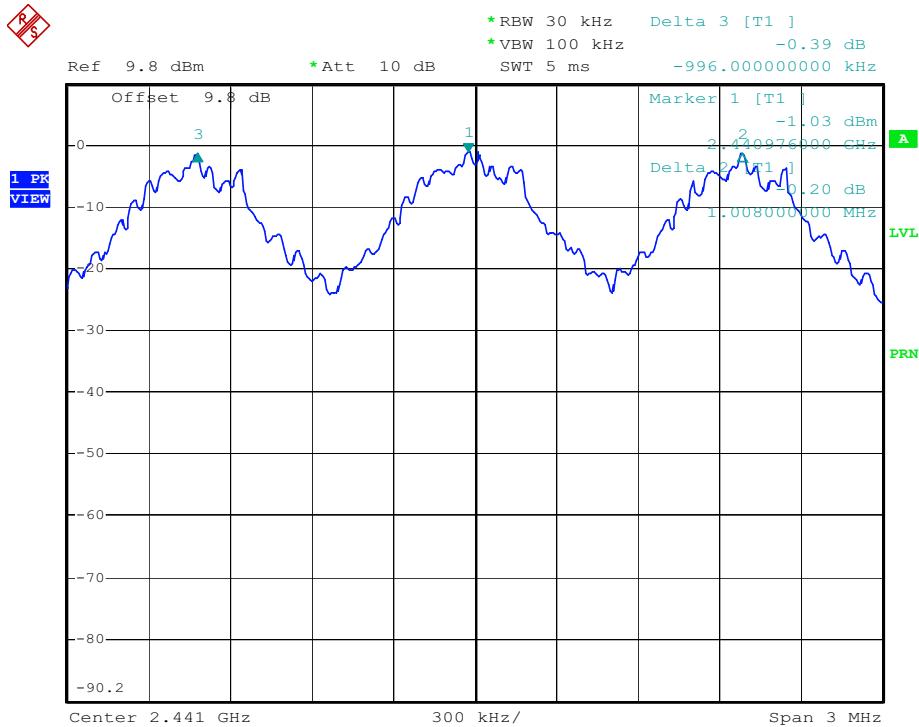
Test Data

| Channel Separation (kHz) | | 20dB Bandwidth (kHz) | | | Limit (kHz) | Result |
|--------------------------|-------|----------------------|------|-------|----------------------------------|--------|
| GFSK | 8DPSK | Channel | GFSK | 8DPSK | | |
| 996 | 984 | Low CH | 948 | 1290 | >25 or >2/3 of the 20dB BW | Pass |
| | | Middle CH | 942 | 1290 | | |
| | | High CH | 936 | 1296 | | |

| | | | | |
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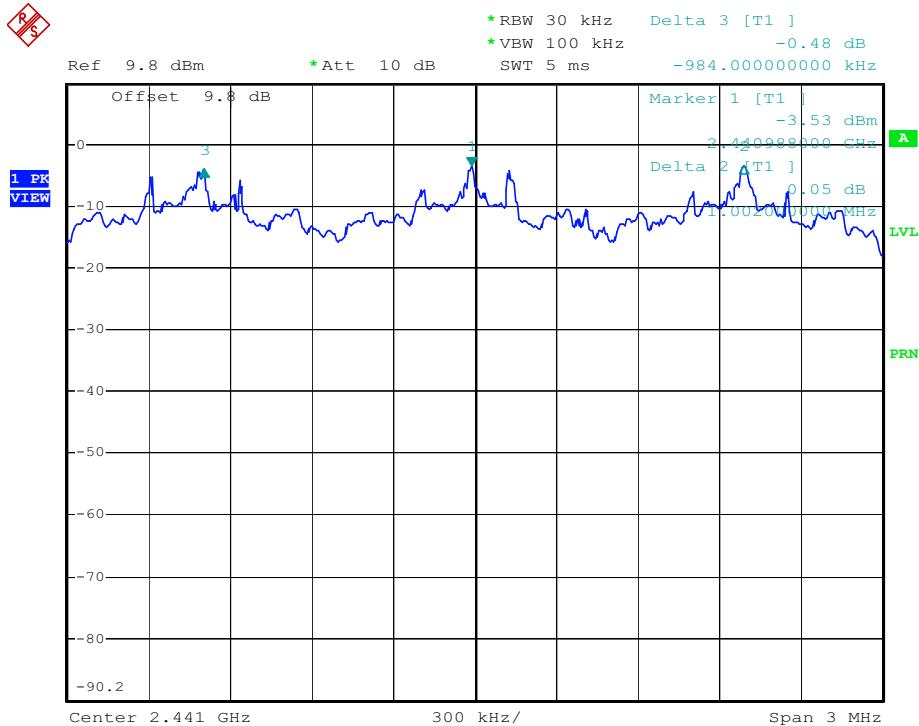
Test Plot

Measurement of Channel Separation(GFSK)



Date: 12.JUL.2009 17:24:30

Measurement of Channel Separation(8DPSK)



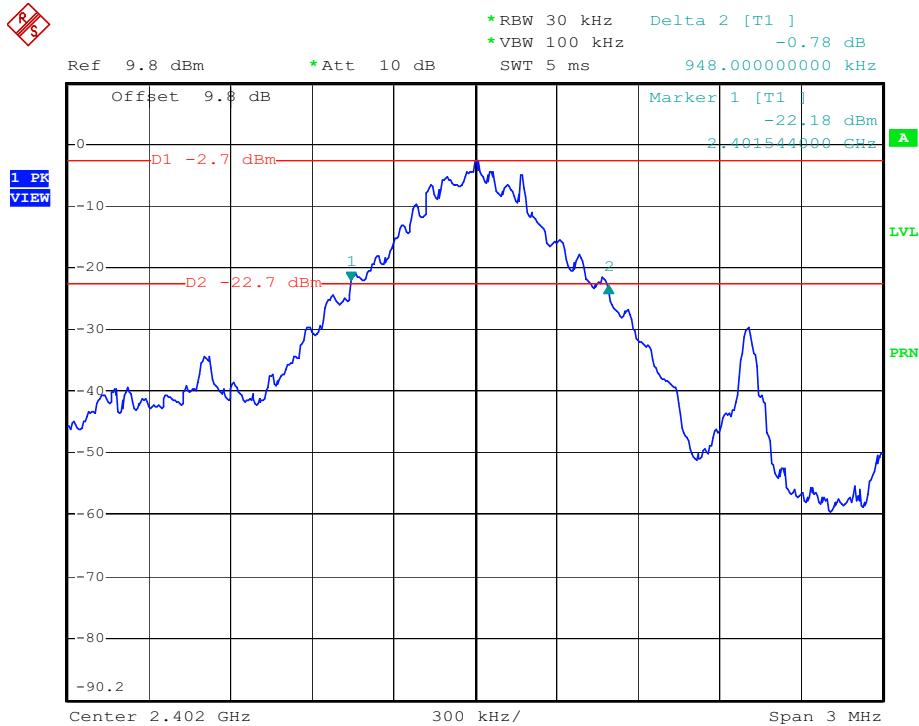
Date: 12.JUL.2009 17:25:26

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Test Plot (GFSK)

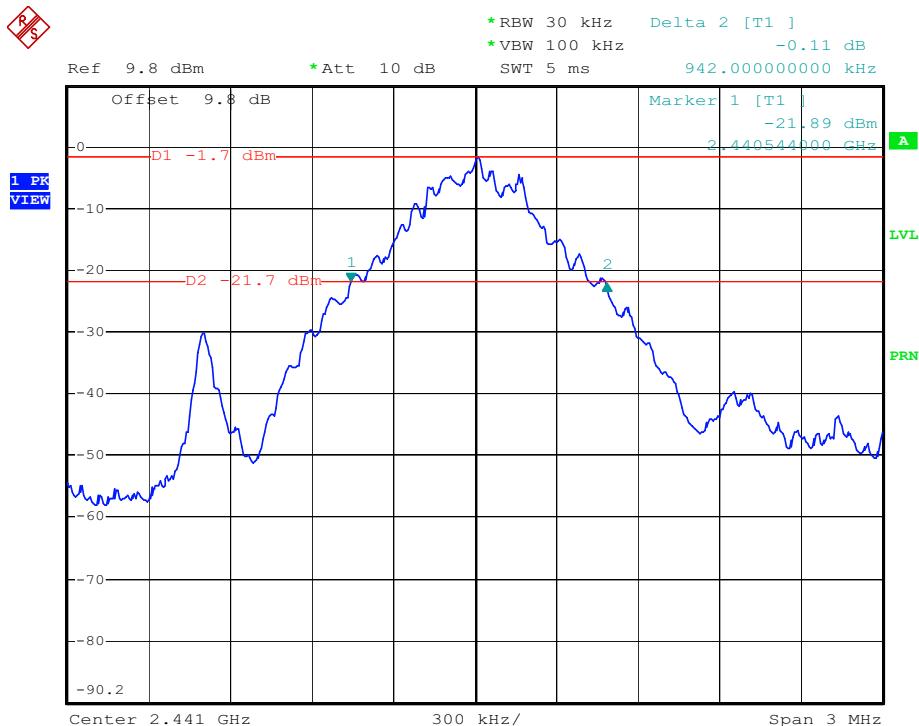
20 dB bandwidth

(Low CH)



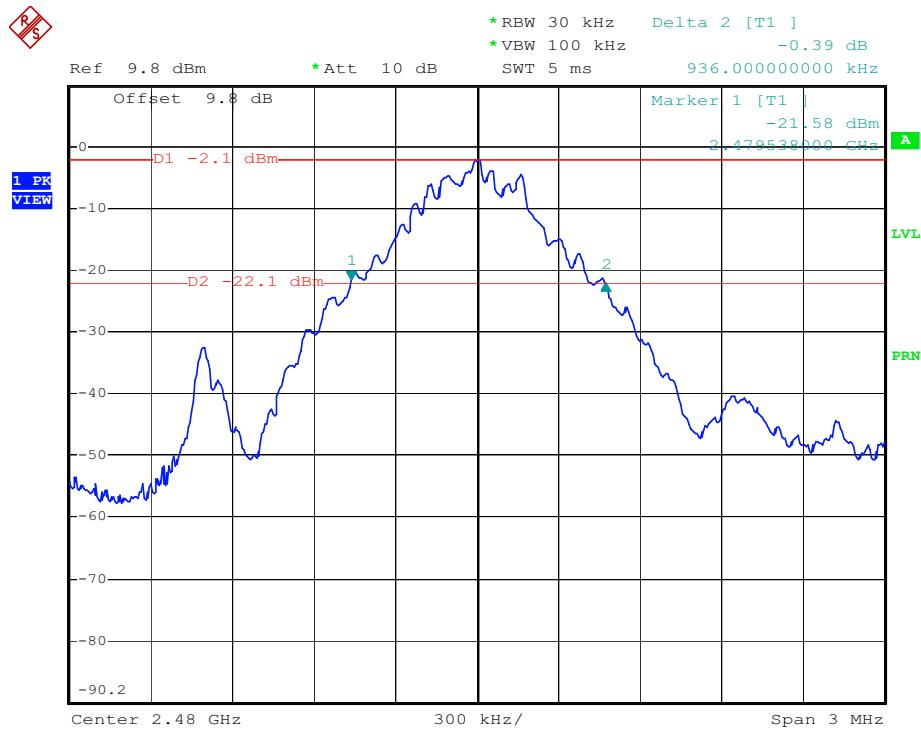
Date: 12.JUL.2009 17:00:04

(Mid CH)



Date: 12.JUL.2009 17:00:56

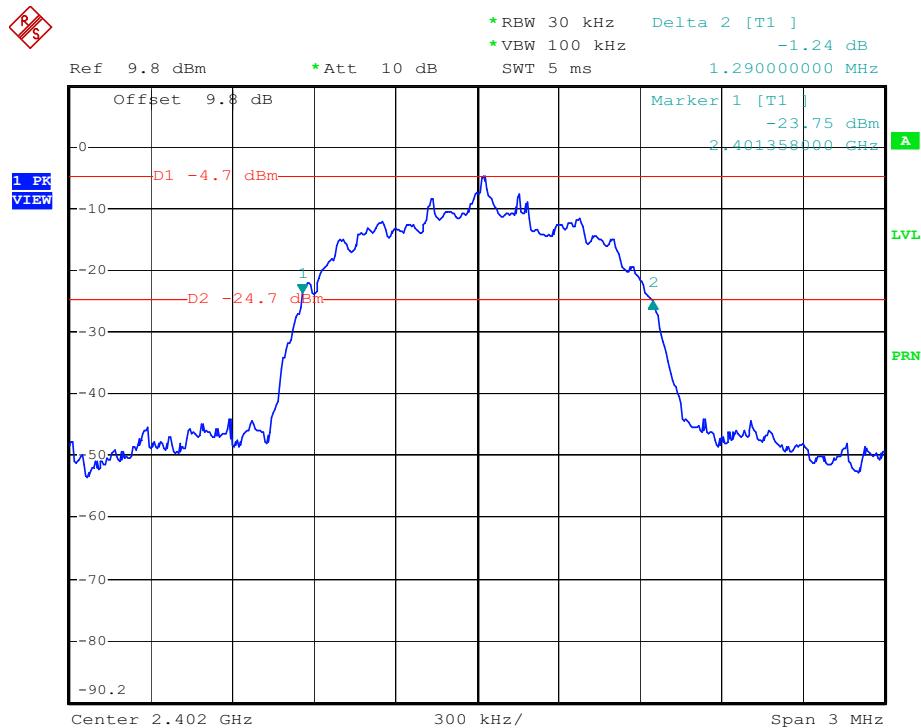
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(High CH)


Date: 12.JUL.2009 17:01:59

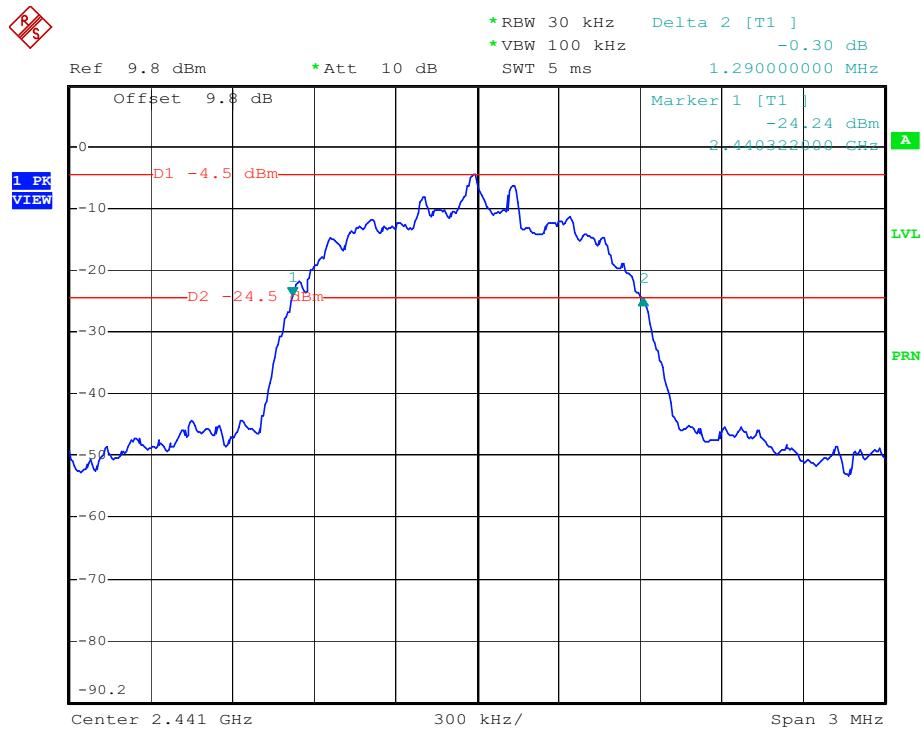
Test Plot (8DPSK)

20 dB bandwidth

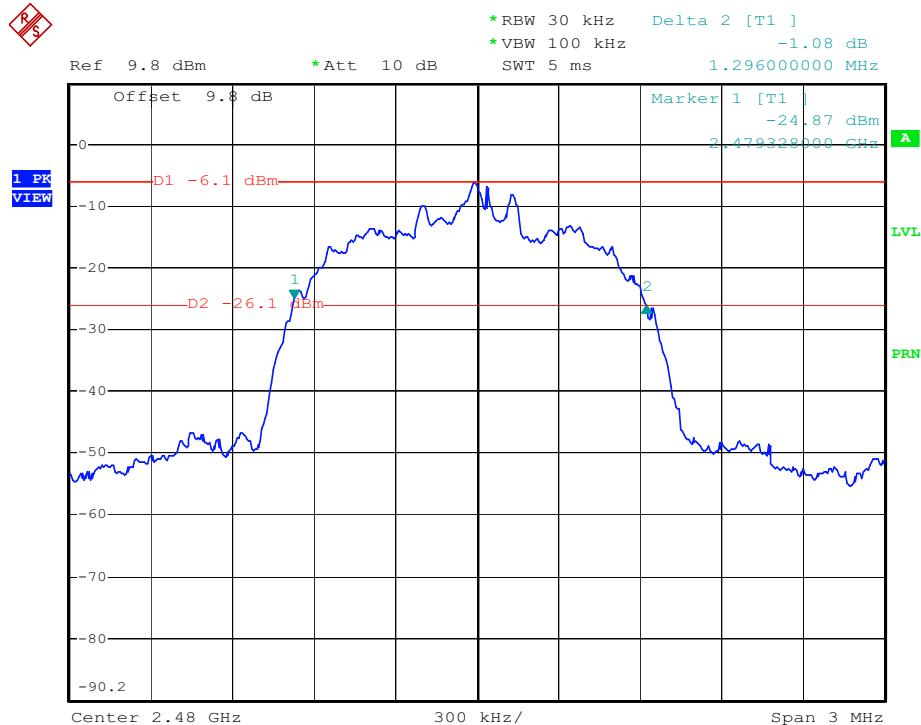
(Low CH)


Date: 12.JUL.2009 17:03:06

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(Mid CH)


Date: 12.JUL.2009 17:04:40

(High CH)


Date: 12.JUL.2009 17:07:04

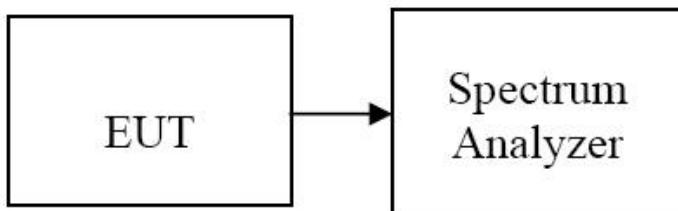
| | | | | |
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7.4 NUMBER OF HOPPING FREQUENCY

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

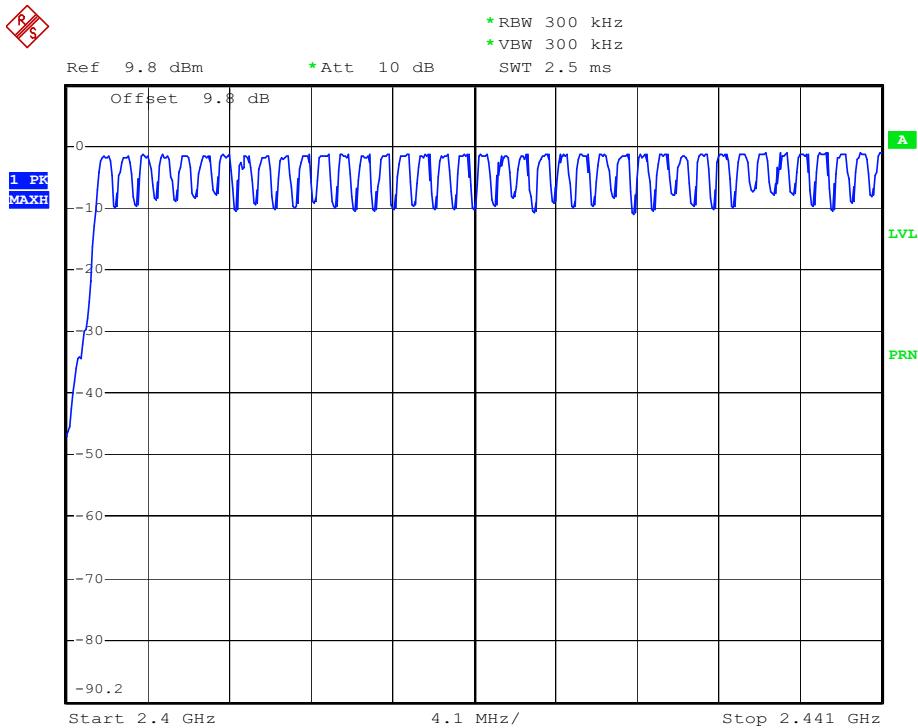
| Result (No. of CH) | Limit (No. of CH) | Result |
|--------------------|-------------------|--------|
| 79 | >15 | Pass |

| | | | |
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Test Plot

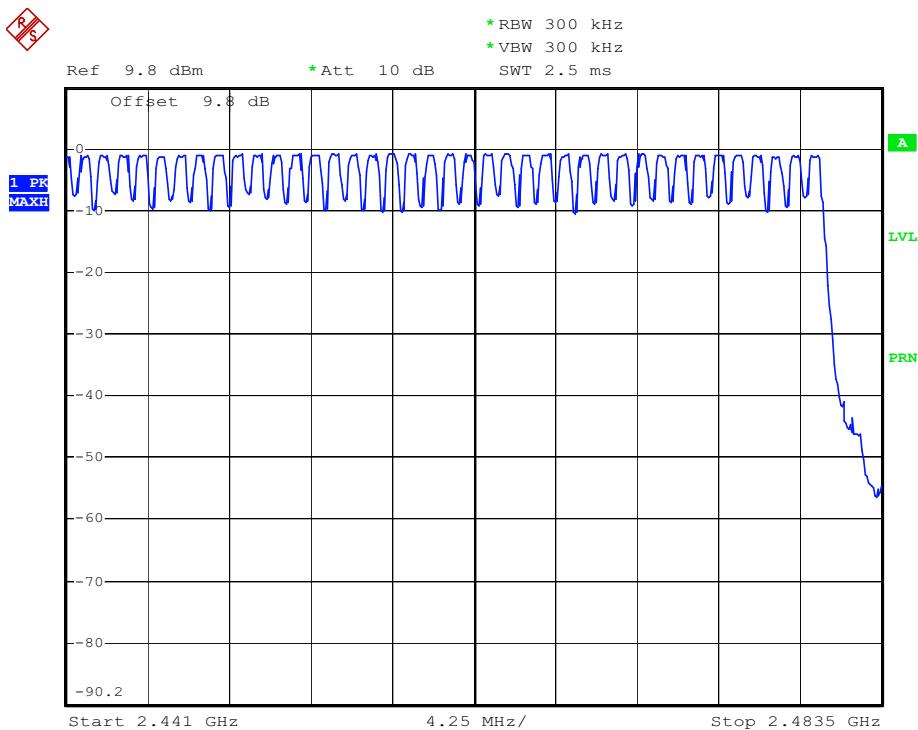
Number of Channels (GFSK)

2.4 GHz – 2.441 GHz



Date: 12.JUL.2009 17:27:31

2.441 GHz – 2.4835 GHz



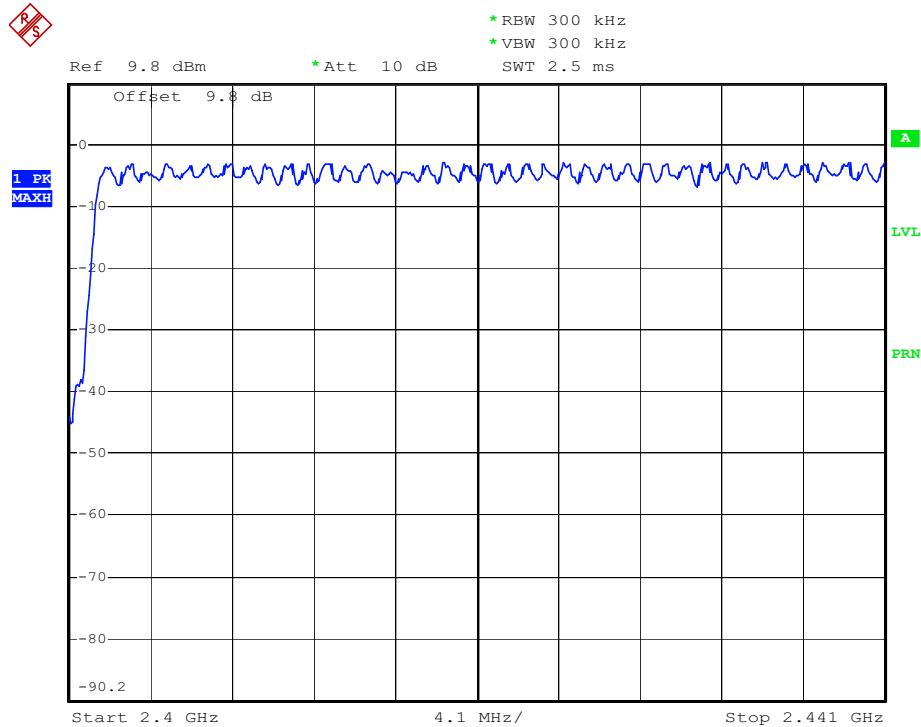
Date: 12.JUL.2009 17:28:17

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|----------------------------------|---------------------------------|--|--|----------------------|
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |



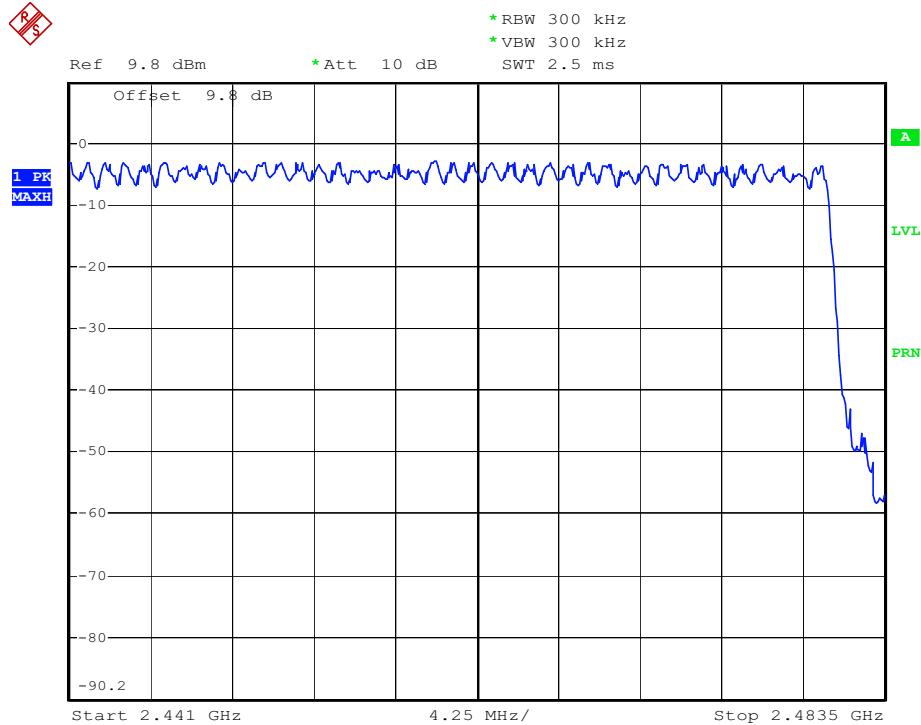
Number of Channels (8DPSK)

2.4 GHz – 2.441 GHz



Date: 12.JUL.2009 17:30:51

2.441 GHz – 2.4835 GHz



Date: 12.JUL.2009 17:32:44

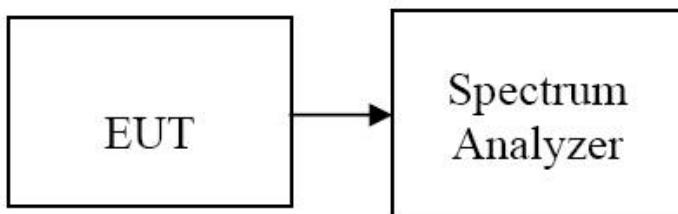
| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|--|----------------------|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |
| HCT-RF09-0717 | July 17, 2009 | | | |

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 = 1 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 for GFSK)

CH Mid : $2.91 * (1600/6)/79 * 31.6 = 310.40 (ms)$

3-DH 5(The longest packet type for 8DPSK)

CH Mid : $2.91 * (1600/6)/79 * 31.6 = 310.40 (ms)$

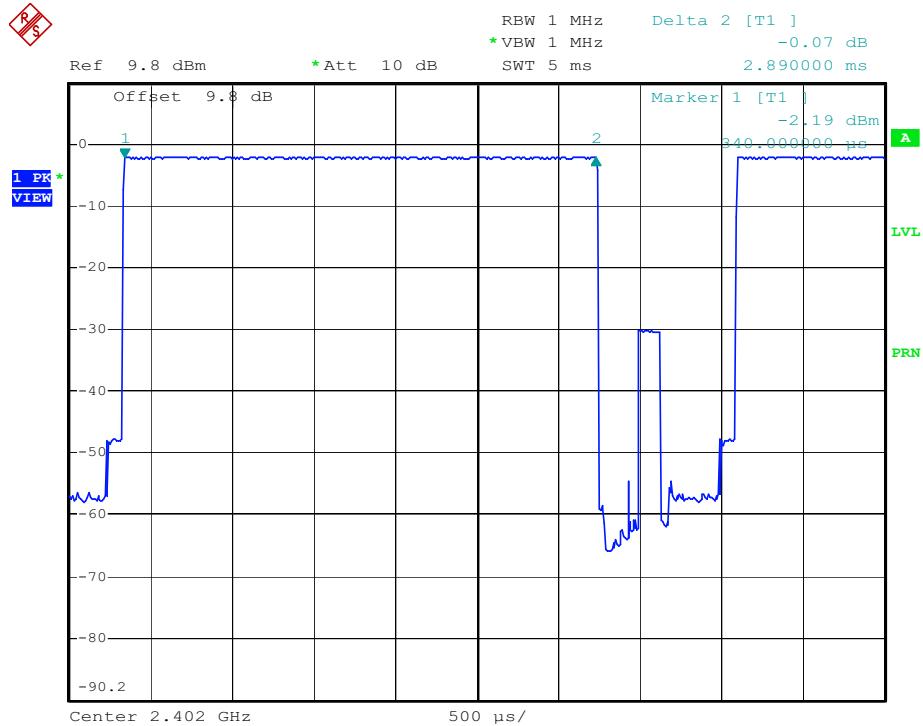
| Channel | Pulse Time (ms) | | Total of Dwell (ms) | | Period Time (s) | Limit (ms) | Result |
|---------|-----------------|-------|---------------------|--------|--------------------|---------------|--------|
| | GFSK | 8DPSK | GFSK | 8DPSK | | | |
| Low | 2.89 | 2.90 | 308.27 | 309.33 | 31.6 | 400 | PASS |
| Mid | 2.91 | 2.91 | 310.40 | 310.40 | 31.6 | | PASS |
| High | 2.91 | 2.90 | 310.40 | 309.33 | 31.6 | | PASS |

| | | | | |
|----------------------------------|---------------------------------|-----------|--|--|
| HCT PT.15.247 TEST REPORT | FCC CERTIFICATION REPORT | | | www.hct.co.kr |
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: | Dual-Band CDMA/EVDO Phone with Bluetooth | FCC ID: TYKNX9290 |

Test Plots (GFSK)

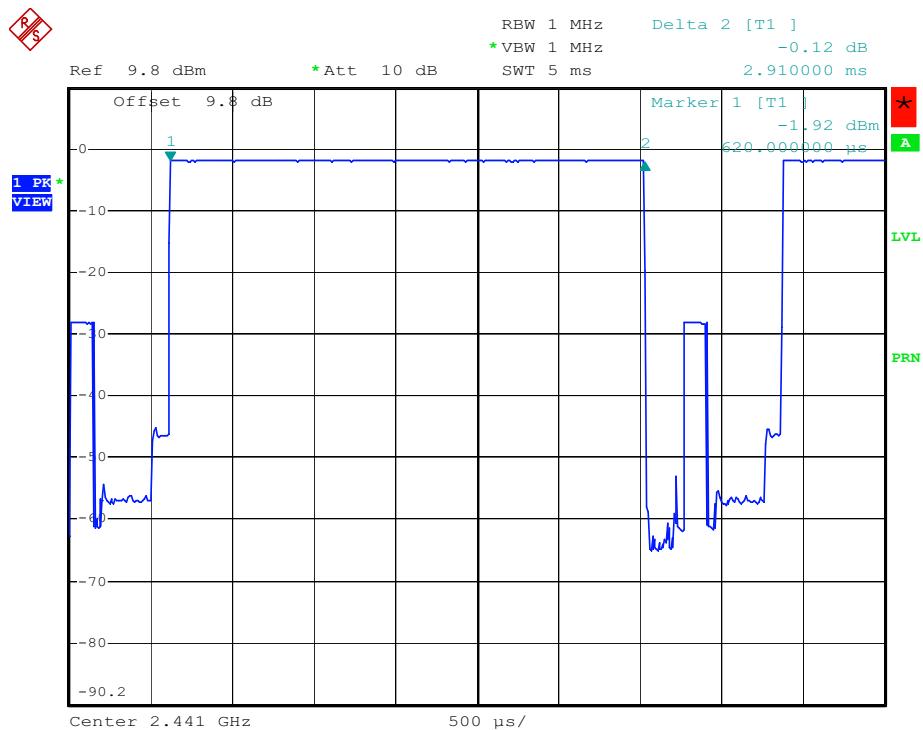
DH 5

(Low CH)



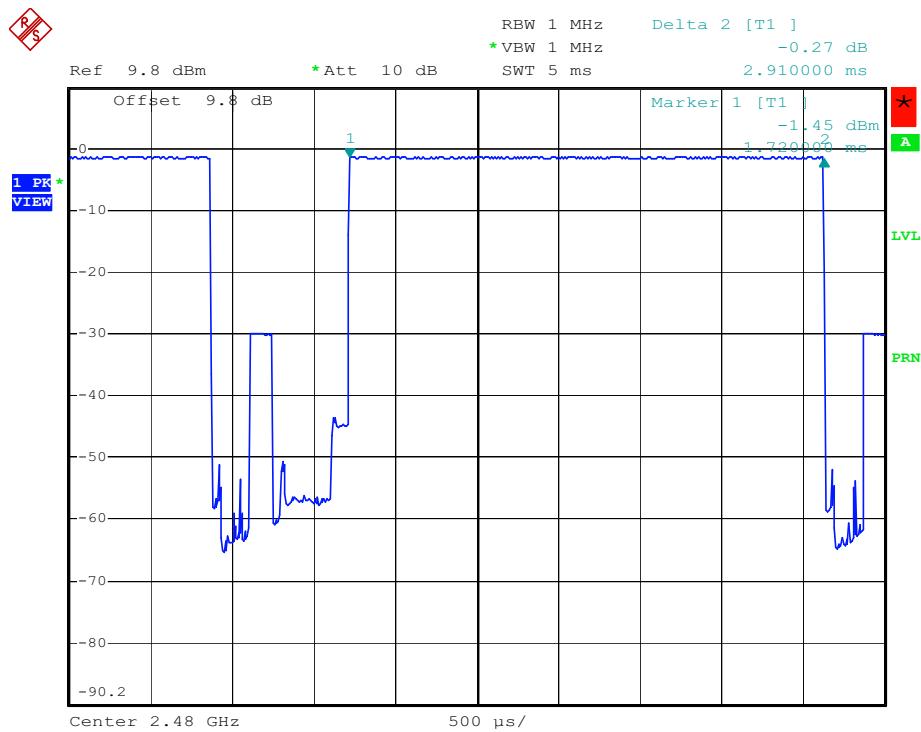
Date: 12.JUL.2009 17:33:43

(Mid CH)

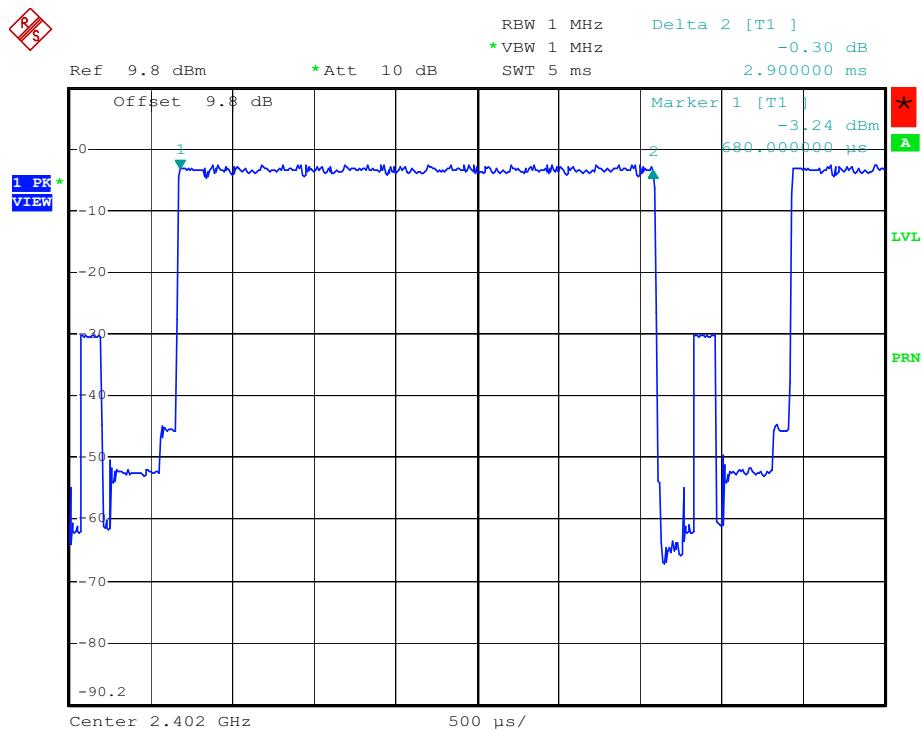


Date: 12.JUL.2009 17:34:15

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|--|----------------------|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |
| HCT-RF09-0717 | July 17, 2009 | | | |

(CH High)


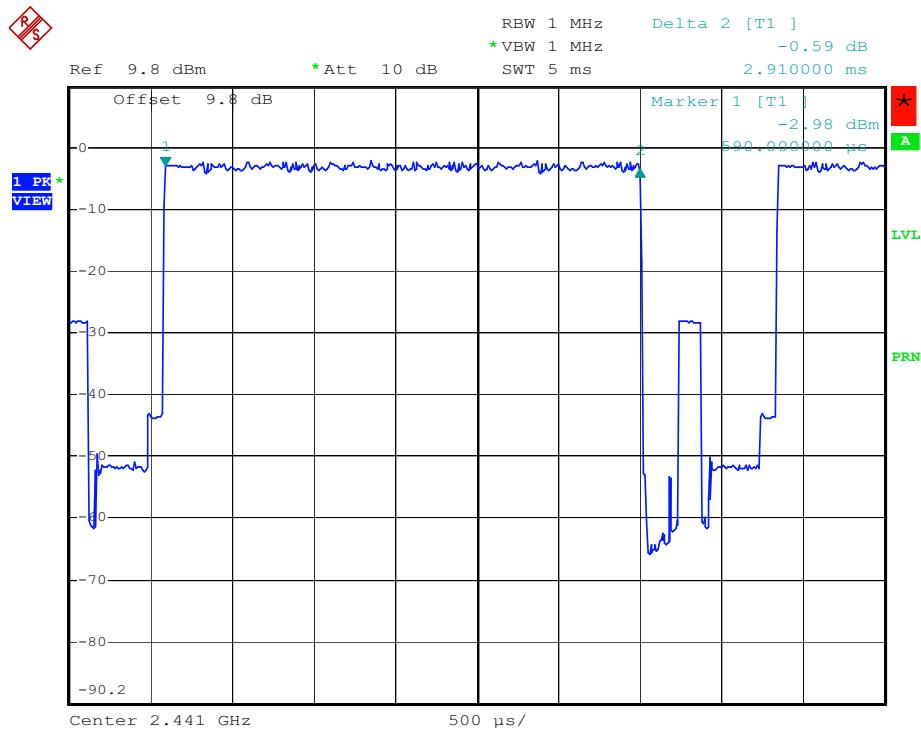
Date: 12.JUL.2009 17:35:10

Test Plots (8DPSK)
3-DH 5
(Low CH)


Date: 12.JUL.2009 17:35:48

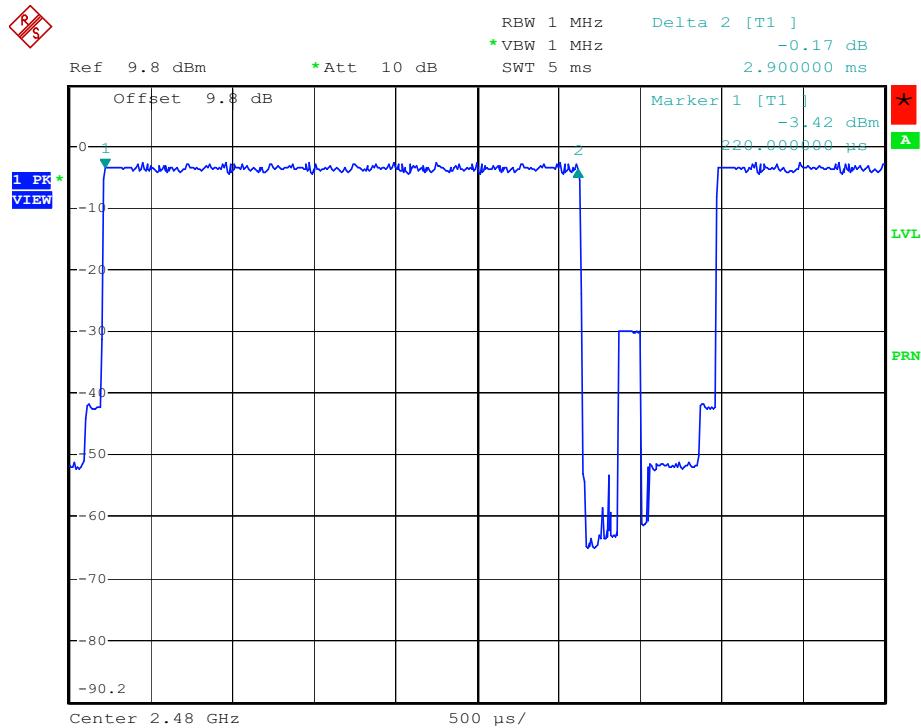
| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|--|-----------------------|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKKNX9290 |
| HCT-RF09-0717 | July 17, 2009 | | | |

(Mid CH)



Date: 12.JUL.2009 17:36:22

(CH High)



Date: 12.JUL.2009 17:36:58

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|----------------------------------|---------------------------------|--|--|----------------------|
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |

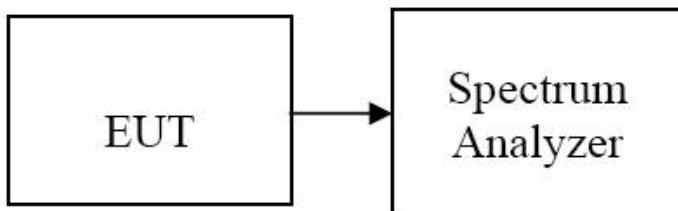
7.6 SPURIOUS EMISSIONS

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.

Detector Mode is set to a peak detector Mode.

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

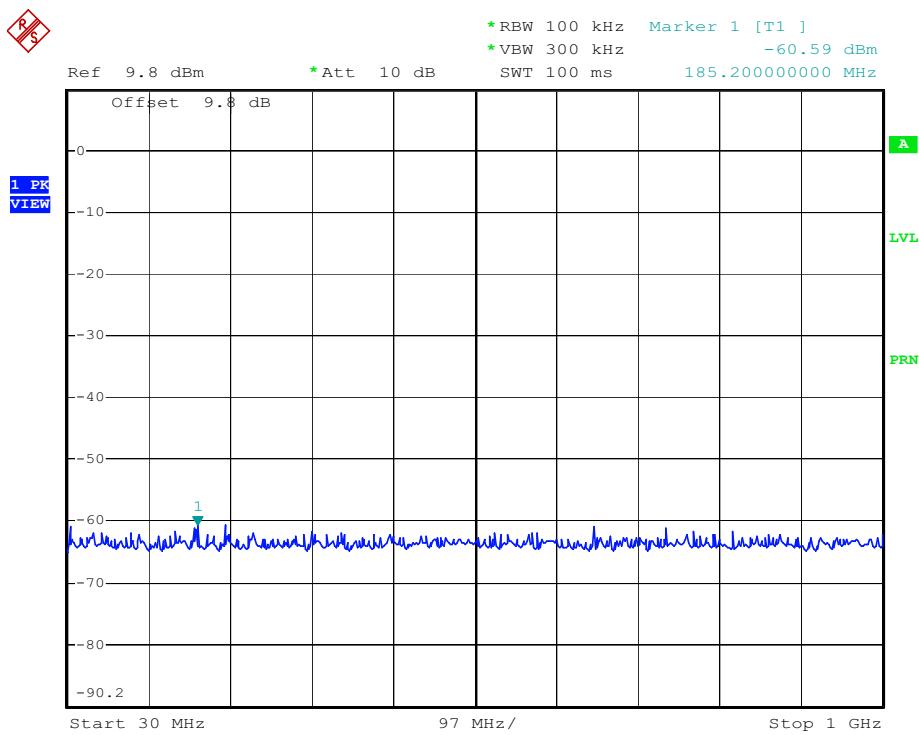
TEST RESULTS

No non-compliance noted

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|--|--|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | |
| HCT-RF09-0717 | July 17, 2009 | | | FCC ID: TYKKNX9290 |

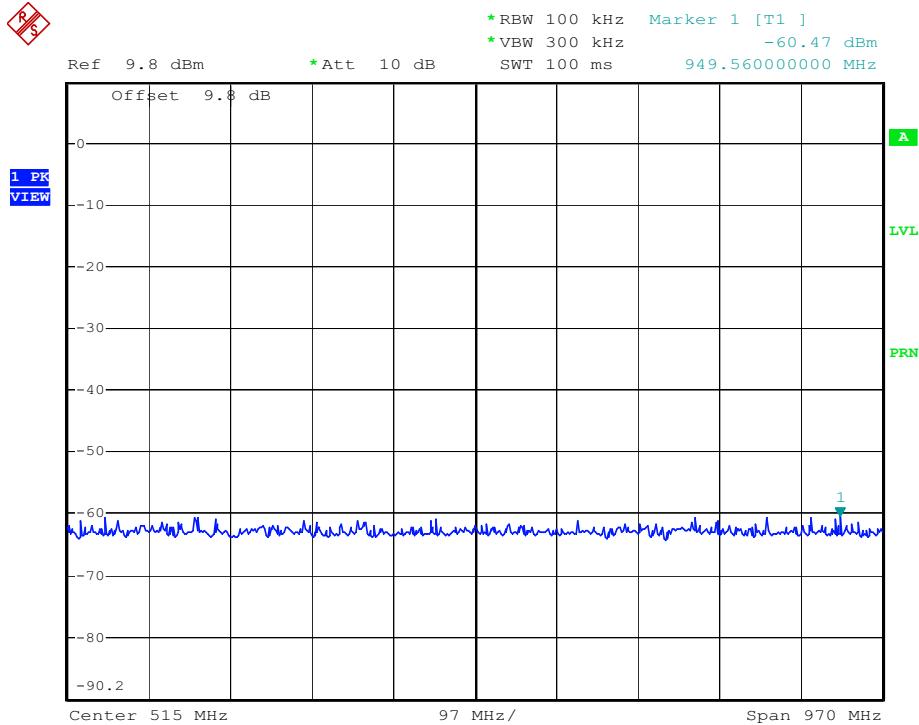
Test Plots (GFSK): – 30 MHz ~ 1 GHz

(Low CH) - 2402 MHz



Date: 12.JUL.2009 17:38:09

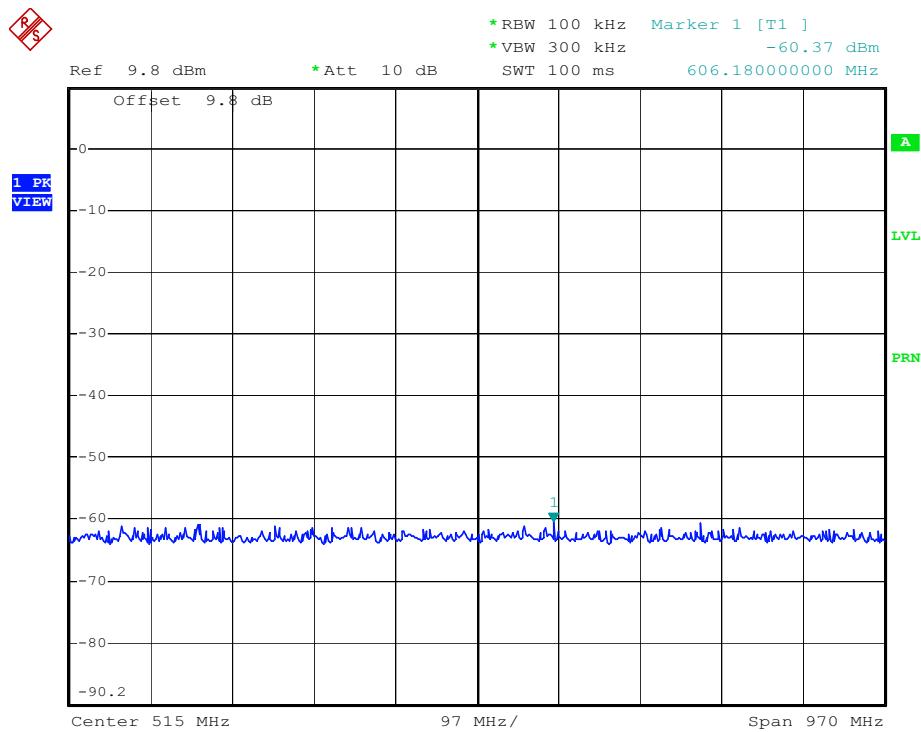
(Mid CH) – 2441 MHz



Date: 12.JUL.2009 17:38:54

| | | | | |
|----------------------------------|---------------------------------|-----------|--|--|
| HCT PT.15.247 TEST REPORT | FCC CERTIFICATION REPORT | | | www.hct.co.kr |
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: | Dual-Band CDMA/EVDO Phone with Bluetooth | FCC ID: TYKNX9290 |

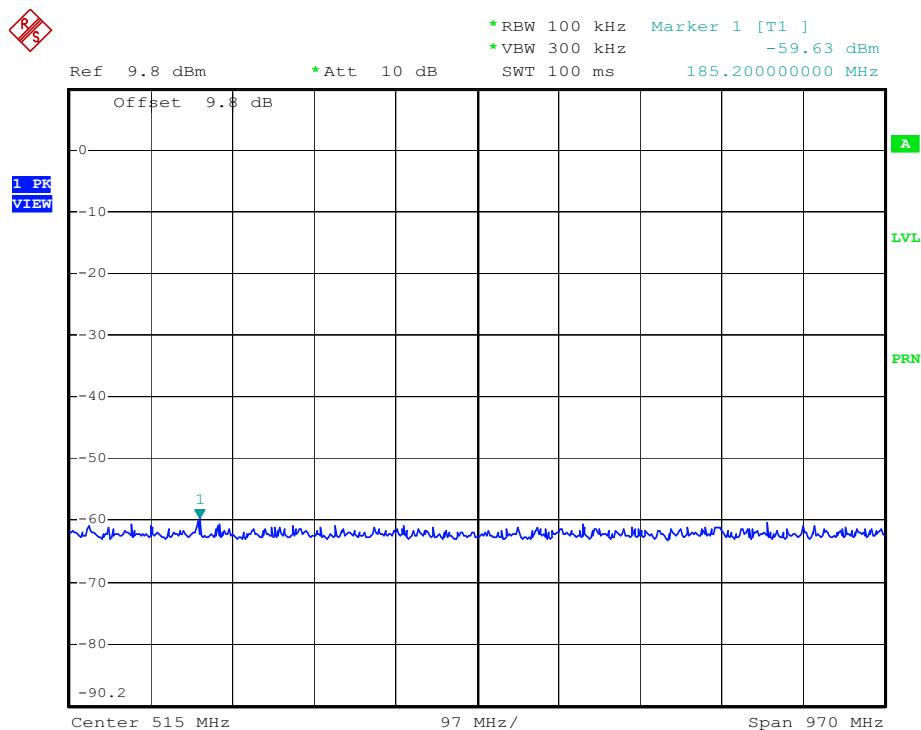
(High CH) – 2480 MHz



Date: 12.JUL.2009 17:39:36

Test Plots (8DPSK): – 30 MHz ~ 1 GHz

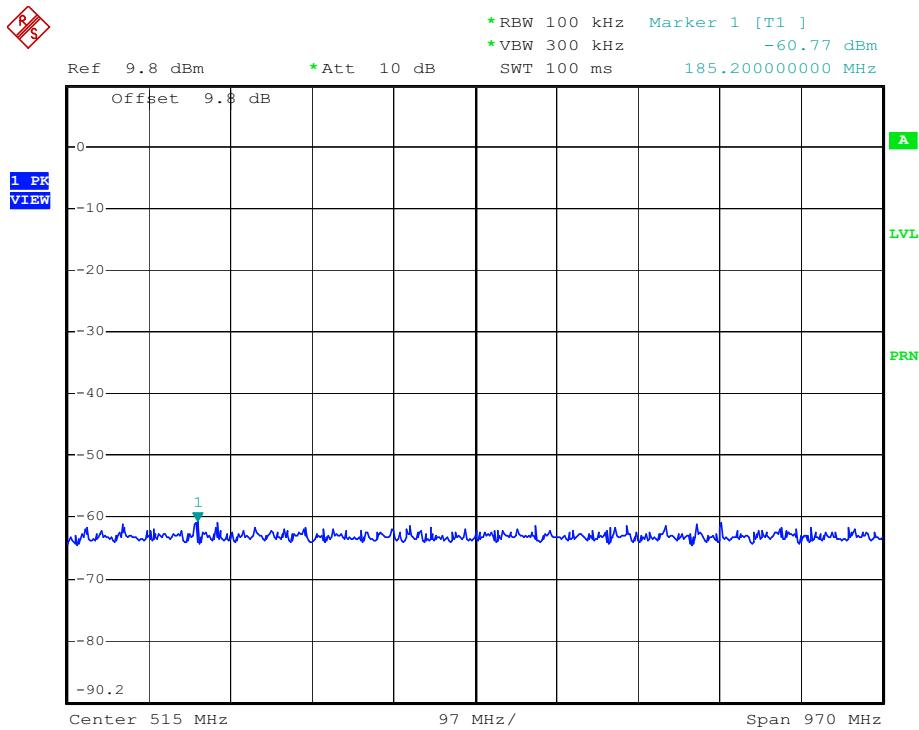
(Low CH) – 2402 MHz



Date: 12.JUL.2009 17:41:37

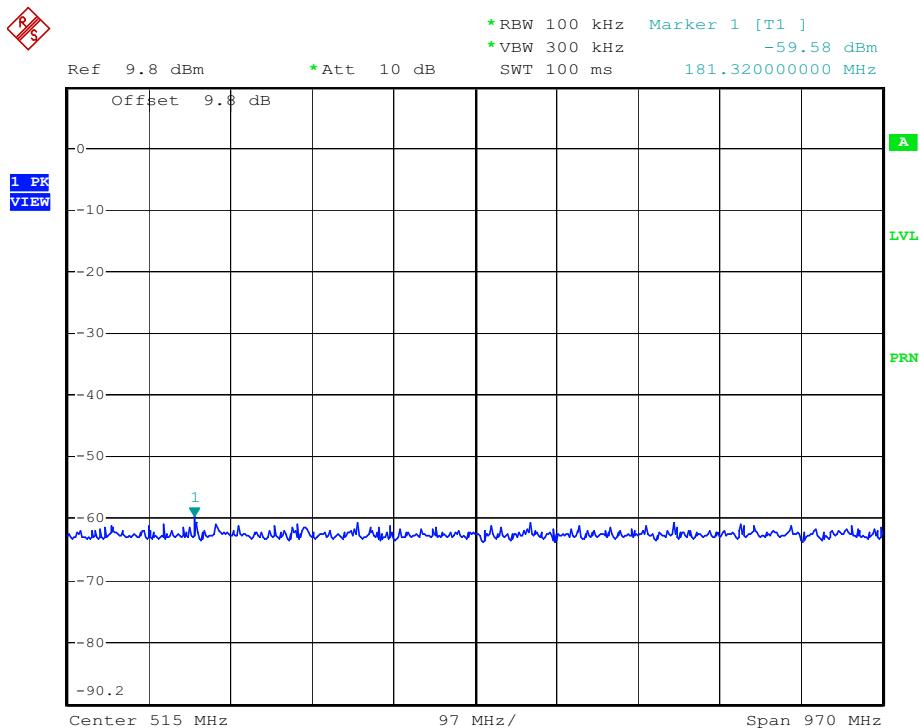
| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|---------------------------|----------------|--|--|--|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | |
| HCT-RF09-0717 | July 17, 2009 | | | FCC ID: TYKNX9290 |

(Mid CH) – 2441 MHz



Date: 12.JUL.2009 17:44:41

(High CH) – 2480 MHz

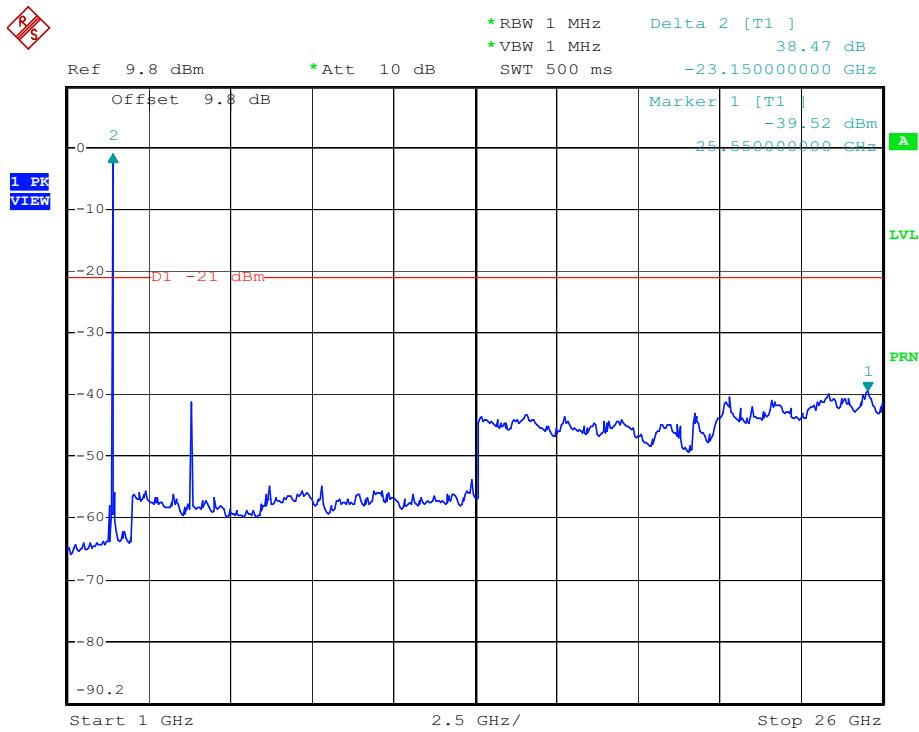


Date: 12.JUL.2009 17:48:05

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|----------------------------------|---------------------------------|--|--|----------------------|
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |

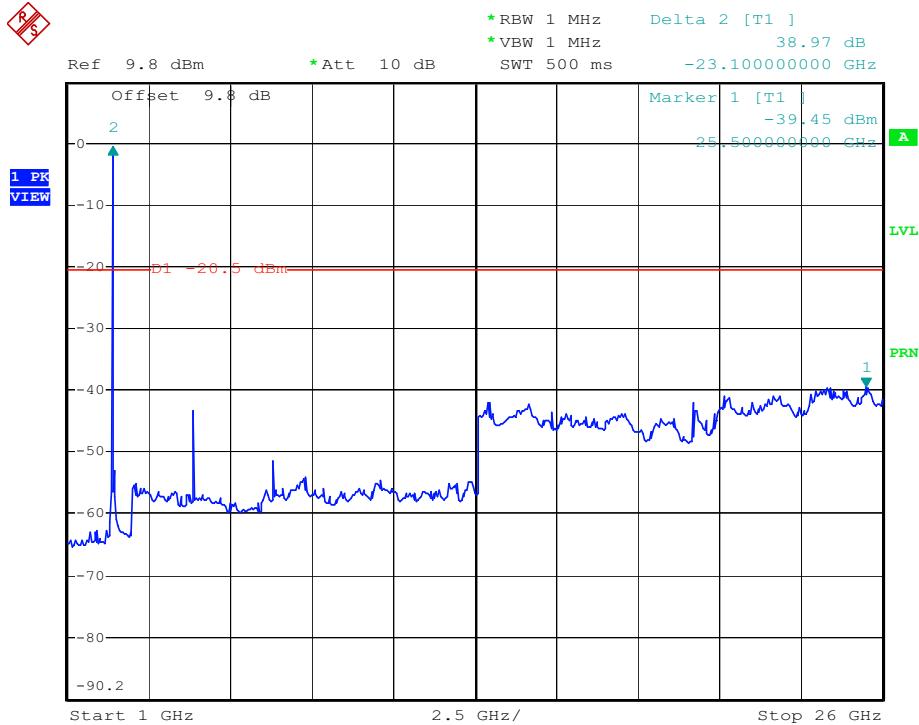
Test Plots (GFSK): – 1 GHz ~ 26 GHz

(Low CH) - 2402 MHz



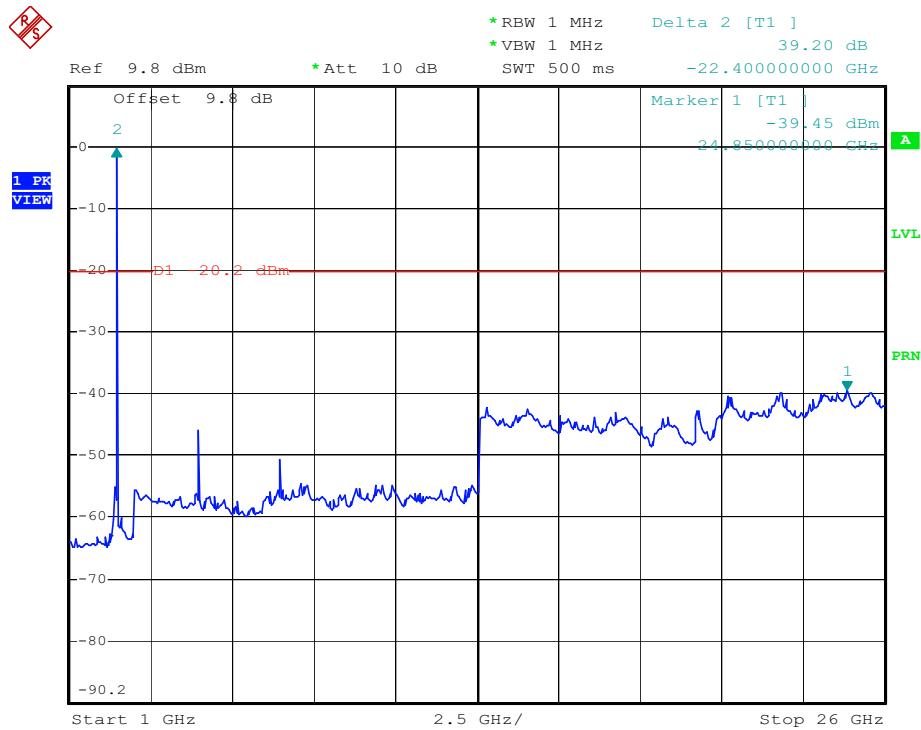
Date: 12.JUL.2009 17:59:06

(Mid CH) – 2441 MHz

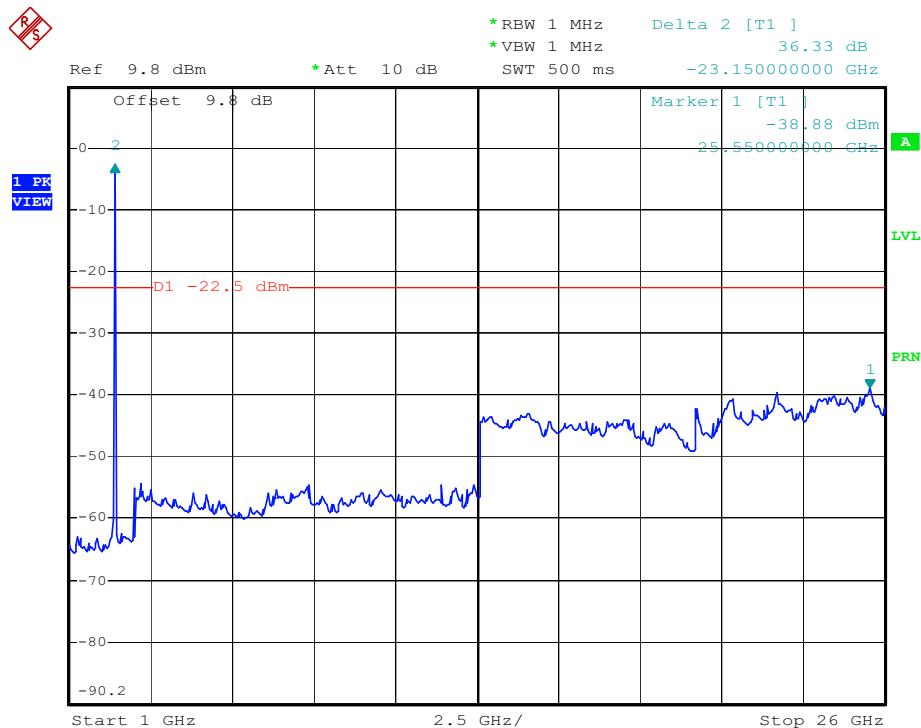


Date: 12.JUL.2009 17:59:54

| | | | | |
|----------------------------------|---------------------------------|--|--|--|
| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |

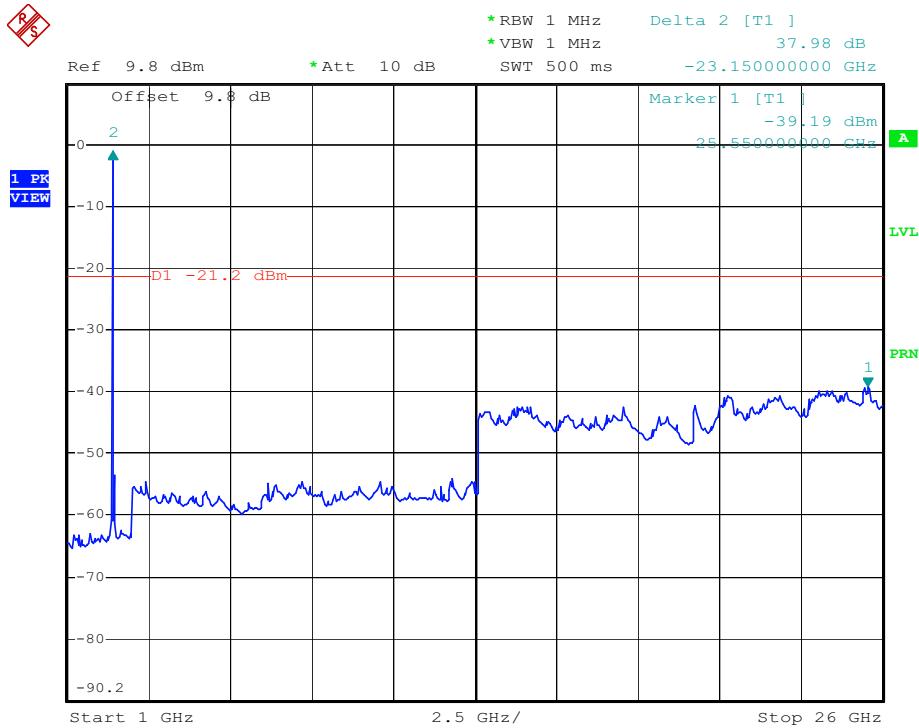
(High CH) – 2480 MHz


Date: 12.JUL.2009 18:00:43

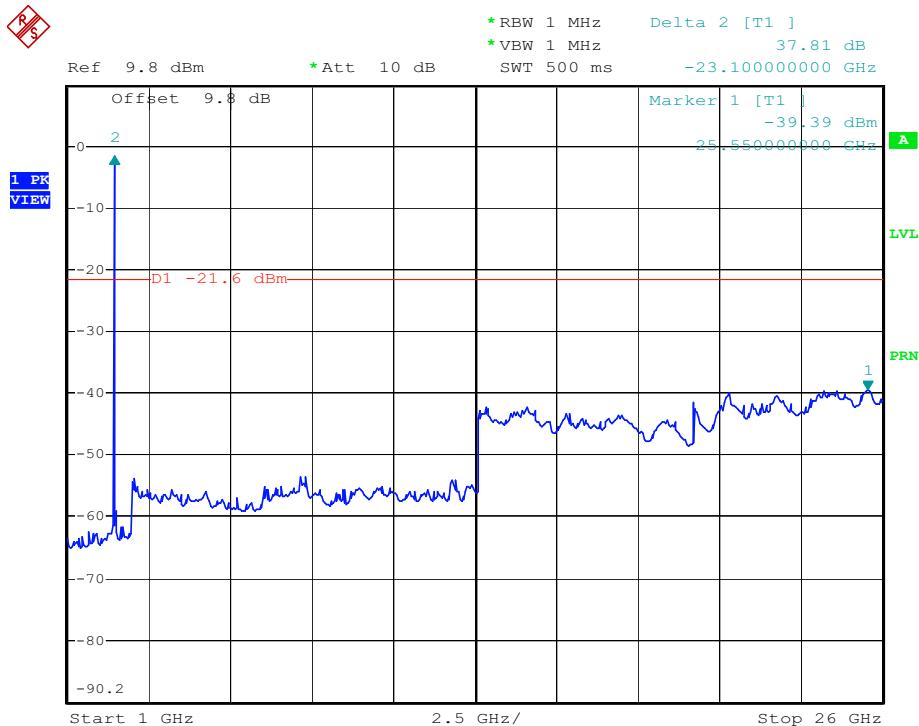
Test Plots (8DPSK): – 1 GHz ~ 26 GHz
(Low CH) – 2402 MHz


Date: 12.JUL.2009 18:01:24

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|---------------------------|----------------|--|--|-------------------|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKNX9290 |
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(Mid CH) – 2441 MHz


Date: 12.JUL.2009 18:02:20

(High CH) – 2480 MHz


Date: 12.JUL.2009 18:03:35

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|--|-----------------------|
| Test Report No. | Date of Issue: | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | | FCC ID: TYKKNX9290 |
| HCT-RF09-0717 | July 17, 2009 | | | |



7.6.2 Radiated Spurious Emissions

LIMIT

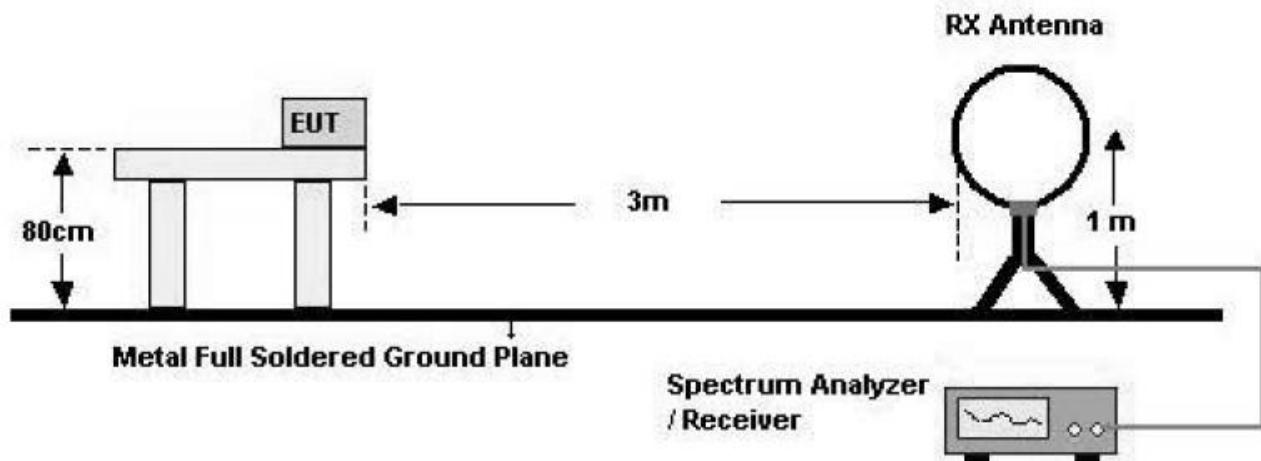
1. 20dBc in any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

| Frequency (MHz) | Field Strength (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 (29.5 dBuV/m) | 30 |
| 30-88 | 100 (40 dBuV/m) | 3 |
| 88-216 | 150 (43.5 dBuV/m) | 3 |
| 216-960 | 200 (46 dBuV/m) | 3 |
| Above 960 | 500 (54 dBuV/m) | 3 |

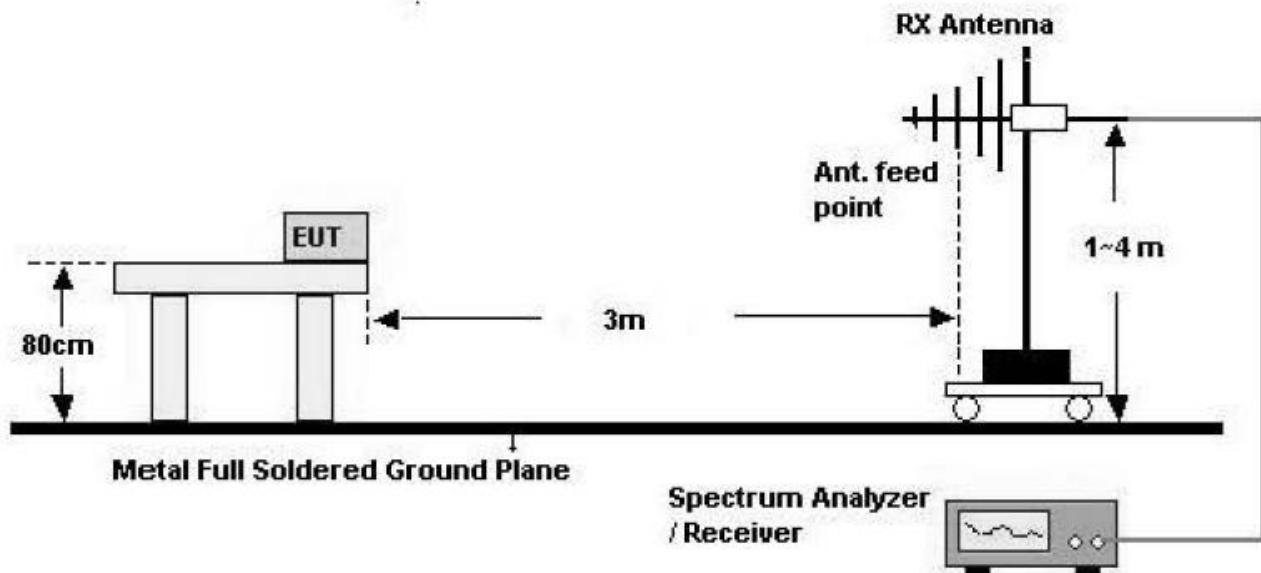
| | | | |
|----------------------------------|---------------------------------|--|--|
| HCT PT.15.247 TEST REPORT | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0717 | Date of Issue: July 17, 2009 | EUT Type: Dual-Band CDMA/EVDO Phone with Bluetooth | FCC ID: TYKKNX9290 |

Test Configuration

Below 30 MHz

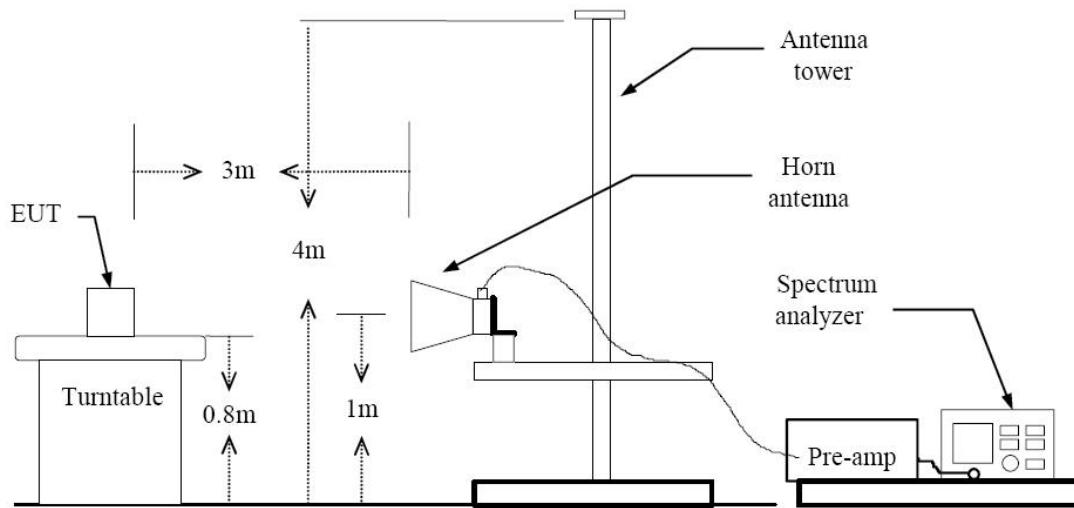


30 MHz - 1 GHz



| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|------------------------------|----------------|--|-----------|--|
| Test Report No. | Date of Issue: | EUT Type: | FCC ID: | |
| HCT-RF09-0717 | July 17, 2009 | Dual-Band CDMA/EVDO Phone with Bluetooth | TYKNX9290 | |

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.

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
|----------------------------------|---------------------------------|--|--|--|
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TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Link

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|-------------------------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz | dB μ N | dB /m | dB | (H/V) | dB μ N/m | dB μ N/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 = $40 \log (\text{specific distance} / \text{test distance})$ (dB)
4. Limit line = specific Limits (dB μ V) + Distance extrapolation factor
5. Detector : Qusi-peak
6. Preliminary Test performed the both normal & EDR and three channels(Low, Mid, High).
The final test performed the worst case mode only.

| | | | | |
|---|--|---|--|--|
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TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link(Mid: 2441 MHz)

| Frequency | Reading | Ant. factor | Cable loss | Ant. POL | Total | Limit | Margin |
|-----------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz | dB μ N | dB /m | dB | (H/V) | dB μ N/m | dB μ N/m | dB |
| 37.0 | 19.7 | 11.8 | 0.7 | H | 32.2 | 40.0 | 7.8 |
| 115.0 | 10.8 | 10.3 | 1.2 | V | 22.3 | 43.5 | 21.2 |

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. RBW: 120 kHz, UBW: 300 kHz
4. Preliminary Test performed the both normal & EDR and three channels(Low, Mid, High).
The final test performed the worst case mode only.

| HCT PT.15.247 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
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Above 1 GHz

Operation Mode: CH Low (Normal)

| Frequency [MHz] | Reading dBuV | AN.+CL-AMP GAIN. [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|--------------------|-----------------|--------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4804 | 52.41 | -4.79 | V | 47.62 | 74 | 26.38 | PK |
| 4804 | 39.67 | -4.79 | V | 34.88 | 54 | 19.12 | AV |
| 7206 | 52.95 | 1.21 | V | 54.16 | 74 | 19.84 | PK |
| 7206 | 40.51 | 1.21 | V | 41.72 | 54 | 12.28 | AV |
| 4804 | 53.00 | -4.79 | H | 48.21 | 74 | 25.79 | PK |
| 4804 | 40.40 | -4.79 | H | 35.61 | 54 | 18.39 | AV |
| 7206 | 53.29 | 1.21 | H | 54.50 | 74 | 19.50 | PK |
| 7206 | 41.25 | 1.21 | H | 42.46 | 54 | 11.54 | 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 (Normal)**

| Frequency [MHz] | Reading dBuV | AN.+CL-AMP GAIN. [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|--------------------|-----------------|--------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4882 | 53.81 | -4.61 | V | 49.20 | 74 | 24.80 | PK |
| 4882 | 40.14 | -4.61 | V | 35.53 | 54 | 18.47 | AV |
| 7323 | 54.19 | 1.62 | V | 55.81 | 74 | 18.19 | PK |
| 7323 | 41.06 | 1.62 | V | 42.68 | 54 | 11.32 | AV |
| 4882 | 52.68 | -4.61 | H | 48.07 | 74 | 25.93 | PK |
| 4882 | 40.11 | -4.61 | H | 35.50 | 54 | 18.50 | AV |
| 7323 | 53.88 | 1.62 | H | 55.50 | 74 | 18.50 | PK |
| 7323 | 41.04 | 1.62 | H | 42.66 | 54 | 11.34 | 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 (Normal)**

| Frequency [MHz] | Reading dBuV | AN.+CL-AMP GAIN. [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|--------------------|-----------------|--------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 4960 | 52.80 | -4.42 | V | 48.38 | 74 | 25.62 | PK |
| 4960 | 39.91 | -4.42 | V | 35.49 | 54 | 18.51 | AV |
| 7440 | 54.54 | 2.04 | V | 56.58 | 74 | 17.42 | PK |
| 7440 | 41.50 | 2.04 | V | 43.54 | 54 | 10.46 | AV |
| 4960 | 53.29 | -4.42 | H | 48.87 | 74 | 25.13 | PK |
| 4960 | 40.11 | -4.42 | H | 35.69 | 54 | 18.31 | AV |
| 7440 | 54.83 | 2.04 | H | 56.87 | 74 | 17.13 | PK |
| 7440 | 41.56 | 2.04 | H | 43.60 | 54 | 10.40 | 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 > 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 MH.
 - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 10 Hz.

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7.6.3 Radiated Restricted Band Edge Measurements

Test Requirements and limit, §15.247(d)

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: | EDR(8DPSK) |
| Operating Frequency | 2402, 2480 MHz |
| Channel No. | 0, 78 Ch |

| Frequency [MHz] | Reading dBuV | AN.+CL-AMP G [dB] | ANT. POL [H/V] | Total [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Detect |
|-----------------|--------------|-------------------|----------------|----------------|----------------|-------------|--------|
| 2383.44 | 51.08 | -10.19 | H | 40.89 | 74 | 33.11 | PK |
| 2383.44 | 38.11 | -10.19 | H | 27.92 | 54 | 26.08 | AV |
| 2342.64 | 51.01 | -10.36 | V | 40.65 | 74 | 33.35 | PK |
| 2342.64 | 38.12 | -10.36 | V | 27.76 | 54 | 26.24 | AV |
| 2494.06 | 50.31 | -9.72 | H | 40.59 | 74 | 33.41 | PK |
| 2494.06 | 37.96 | -9.72 | H | 28.24 | 54 | 25.76 | AV |
| 2493.07 | 50.13 | -9.72 | V | 40.41 | 74 | 33.59 | PK |
| 2493.07 | 38.04 | -9.72 | V | 28.32 | 54 | 25.68 | AV |

Notes:

1. 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

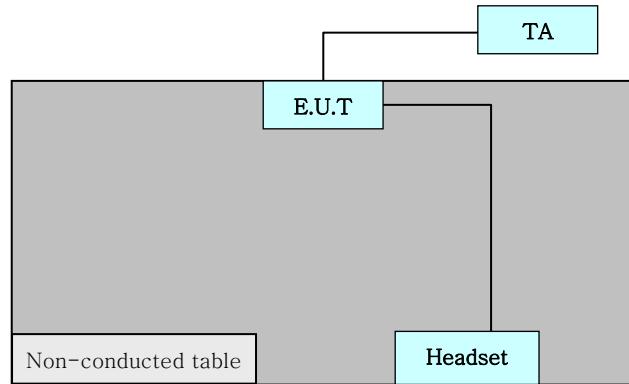
LIMIT

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 (HOT and NEUTRAL) and ground at the power terminals.

Test Configuration



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.

* Normal & EDR

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Test Plot

Conducted emissions (Line 1 / Mid CH / EDR) – HOT

EUT : C741

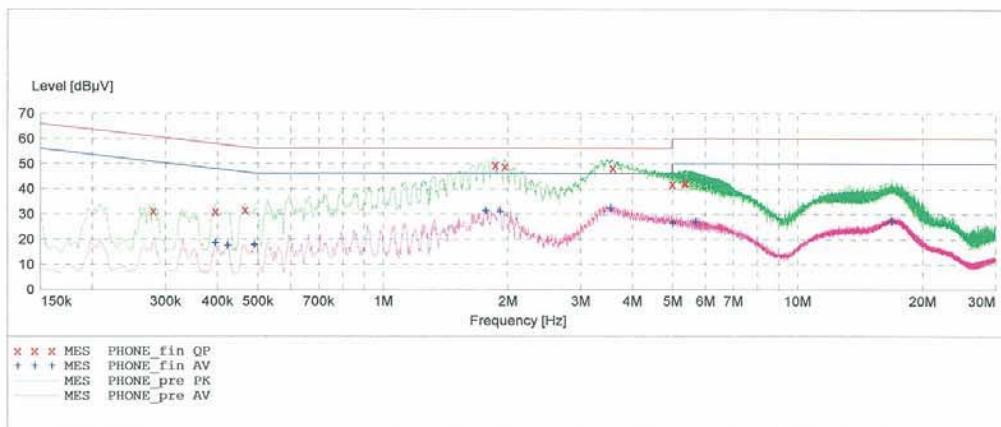
HCT

EMC TEST LAB.

EUT: C741
 Manufacturer: CASIO HITACHI Mobile Communications Co., Ltd.
 Operating Condition: Bluetooth Mode
 Test Site: SHIELD ROOM
 Operator: KH-KIM
 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 Bandw. |
| 150.1 kHz | 500.0 kHz | 2.5 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"

7/2/2009 10:15AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.280100 | 31.30 | 10.1 | 61 | 29.5 | --- | --- |
| 0.395100 | 31.10 | 10.1 | 58 | 26.8 | --- | --- |
| 0.465100 | 31.80 | 10.2 | 57 | 24.8 | --- | --- |
| 1.864000 | 49.40 | 10.3 | 56 | 6.6 | --- | --- |
| 1.968000 | 49.00 | 10.4 | 56 | 7.0 | --- | --- |
| 3.588000 | 48.40 | 10.5 | 56 | 7.6 | --- | --- |
| 5.000000 | 42.00 | 10.7 | 56 | 14.0 | --- | --- |
| 5.348000 | 42.60 | 10.7 | 60 | 17.4 | --- | --- |
| 5.376000 | 42.60 | 10.7 | 60 | 17.4 | --- | --- |

MEASUREMENT RESULT: "PHONE_fin_AV"

7/2/2009 10:15AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.395100 | 18.70 | 10.1 | 48 | 29.3 | --- | --- |
| 0.422600 | 17.60 | 10.1 | 47 | 29.8 | --- | --- |

Page 1/2 7/2/2009 10:15AM HCT EMC LAB

| | | | | | | | |
|----------------------------------|---------------------------------|--|--|--|--|--|--|
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MEASUREMENT RESULT: "PHONE fin AV"

(continued)

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|------|-----|
| 0.490100 | 18.00 | 10.2 | 46 | 28.2 | --- | --- |
| 1.768000 | 31.40 | 10.3 | 46 | 14.6 | --- | --- |
| 1.916000 | 31.10 | 10.3 | 46 | 14.9 | --- | --- |
| 3.544000 | 32.50 | 10.5 | 46 | 13.5 | --- | --- |
| 5.000000 | 26.80 | 10.7 | 46 | 19.2 | --- | --- |
| 5.680000 | 27.10 | 10.8 | 50 | 22.9 | --- | --- |
| 16.828000 | 27.50 | 12.2 | 50 | 22.5 | --- | --- |

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Conducted emissions (Line 2 / Mid CH / EDR) – NEUTRAL

EUT : C741

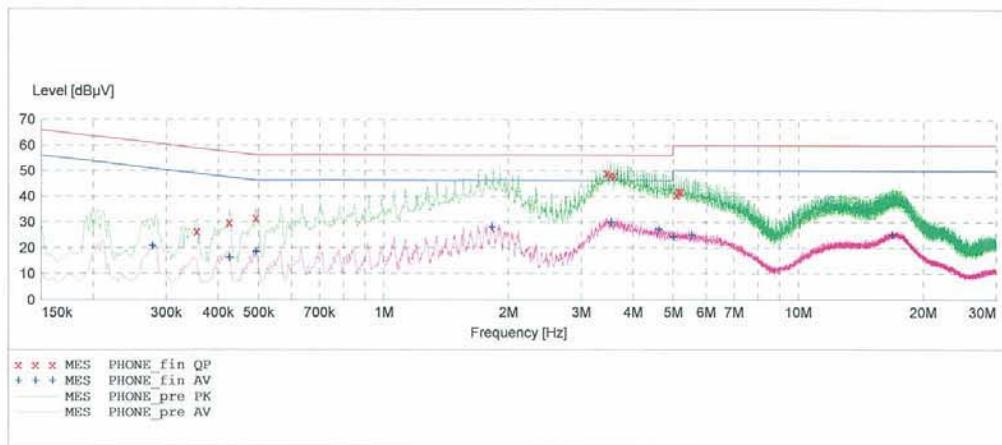
HCT

EMC TEST LAB.

EUT: C741
Manufacturer: CASIO HITACHI Mobile Communications Co., Ltd.
Operating Condition: Bluetooth Mode
Test Site: SHIELD ROOM
Operator: KH-KIM
Test Specification: CISPR 22 CLASS B
Comment: N

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 | 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"

7/2/2009 10:19AM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.355100 | 26.30 | 10.1 | 59 | 32.6 | --- | --- |
| 0.425100 | 29.80 | 10.1 | 57 | 27.5 | --- | --- |
| 0.492600 | 31.60 | 10.2 | 56 | 24.5 | --- | --- |
| 3.456000 | 49.20 | 10.5 | 56 | 6.8 | --- | --- |
| 3.532000 | 48.30 | 10.5 | 56 | 7.7 | --- | --- |
| 3.600000 | 48.20 | 10.5 | 56 | 7.8 | --- | --- |
| 5.088000 | 40.70 | 10.7 | 60 | 19.3 | --- | --- |
| 5.152000 | 42.10 | 10.7 | 60 | 17.9 | --- | --- |
| 5.224000 | 41.90 | 10.7 | 60 | 18.1 | --- | --- |

MEASUREMENT RESULT: "PHONE_fin_AV"

7/2/2009 10:19AM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.277600 | 20.70 | 10.1 | 51 | 30.1 | --- | --- |
| 0.425100 | 16.10 | 10.1 | 47 | 31.2 | --- | --- |

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MEASUREMENT RESULT: "PHONE fin AV"

(continued)

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|------|-----|
| 0.492600 | 18.50 | 10.2 | 46 | 27.7 | --- | --- |
| 1.820000 | 28.10 | 10.3 | 46 | 17.9 | --- | --- |
| 3.540000 | 29.80 | 10.5 | 46 | 16.2 | --- | --- |
| 4.616000 | 27.10 | 10.6 | 46 | 18.9 | --- | --- |
| 5.000000 | 24.20 | 10.7 | 46 | 21.8 | --- | --- |
| 5.532000 | 24.90 | 10.7 | 50 | 25.1 | --- | --- |
| 16.808000 | 25.10 | 12.2 | 50 | 24.9 | --- | --- |

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8. LIST OF TEST EQUIPMENT

| Manufacturer | Model / Equipment | Cal Interval | Calibration Due | Serial No. |
|-----------------------|------------------------------------|--------------|-----------------|--------------|
| Rohde & Schwarz | ESH2-Z5/ LISN | Annual | 04/10/2010 | 861741/013 |
| Rohde & Schwarz | ESH3-Z6/ LISN | Annual | 06/13/2010 | 100329 |
| Schwarzbeck | VULB 9160/ TRILOG Antenna | Biennial | 12/18/2010 | 9160-3150 |
| 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 | ESH3-Z2/ PULSE LIMITER | Annual | 10/30/2009 | 375.8810.352 |
| MITEQ | AMF-60-0010 1800-35-20P/AMP | Annual | 05/20/2010 | 1200937 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | Biennial | 03/26/2010 | 147 |
| Rohde & Schwarz | 6502/Loop Antenna | Biennial | 12/26/2009 | 9009-2536 |
| Rohde & Schwarz | FSP30/Spectrum Analyzer | Annual | 07/31/2009 | 839117/011 |
| Agilent | E4416A /Power Meter | Annual | 01/21/2010 | GB41291412 |
| Wainwright Instrument | WHF3.3/18G-10EF / High Pass Filter | Annual | 06/29/2010 | 1 |
| Hewlett Packard | 11636B/Power Divider | Annual | 12/24/2009 | 11377 |
| DIGITAL | EP-3010 /DC POWER SUPPLY | Annual | 01/07/2010 | 3110117 |

| | | | | |
|---|--|---|--|--|
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