



HCT CO., LTD.

Product Compliance Division

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CERTIFICATE OF COMPLIANCE

Applicant Name:

Zephyrlock, LLC.

14 Finance Drive, Danbury, CT 06810, USA

Date of Issue:

July 28, 2009

Test Site/Location:

HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si, Kyungki-do, 467-701 Korea

Test Report No.: HCT-RF09-0734

HCT FRN: 0005866421

IC Recognition No.: 5944A-1

FCC ID : XLY-2254


APPLICANT : Zephyrlock, LLC.

| | |
|---------------------------------|--|
| Model(s): | 2254 / 2154 |
| EUT Type: | RF system Locker Lock |
| RF Output Field Strength | 16.60 dBuV/m |
| Frequency of Operation: | 13.56186 MHz |
| Modulation type | ASK |
| FCC Classification: | Low Power Communication Device – Transmitter |
| FCC Rule Part(s): | FCC Part 15.225 Subpart C |

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.862


 Report prepared by
 : Hyo Sun Kwak
 Test engineer of RF Team


 Approved by
 : Sang Jun Lee
 Manager of RF Team

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|----------------------------------|---------------------------------|------------------------------------|---------------------|--|
| HCT PT.15.225 TEST REPORT | FCC CERTIFICATION REPORT | | | www.hct.co.kr |
| Test Report No. HCT-RF09-0734 | Date of Issue: July 28, 2009 | EUT Type: RF system Locker Lock | FCC ID: XLY-2254 | Page 1 of 14 |



TABLE OF CONTENTS

| | |
|---|-----|
| 1. GENERAL INFORMATION | 3 |
| 2. EUT DESCRIPTION | 3 |
| 3. TEST METHODOLOGY..... | 4 |
| 3.1 EUT CONFIGURATION..... | 4 |
| 3.2 EUT EXERCISE..... | 4 |
| 3.3 GENERAL TEST PROCEDURES | 4 |
| 3.4 DESCRIPTION OF TEST MODES..... | 4 |
| 3.5 STANDARDS..... | 5 |
| 4. INSTRUMENT CALIBRATION..... | 6 |
| 5. FACILITIES AND ACCREDITATIONS | 6 |
| 5.1 FACILITIES | 6 |
| 5.2 EQUIPMENT | 6 |
| 6. ANTENNA REQUIREMENTS | 6 |
| 7. TEST SUMMARY | 7 |
| 8. RADIATED EMISSION MEASUREMENT | 8 |
| 8.1. Radiated Emission 9 kHz – 30 MHz..... | 9 |
| 8.2. Radiated Emission 30 MHz – 1000 MHz..... | 1 1 |
| 9. EMISSION BANDWIDTH PLOT. | 1 2 |
| 10. FREQUENCY TOLERANCE..... | 1 3 |
| 11. LIST OF TEST EQUIPMENT | 1 4 |



1. GENERAL INFORMATION

Applicant: Zephyrlock, LLC.

Address: 14 Finance Drive, Danbury, CT 06810, USA

FCC ID: XLY-2254

EUT: RFID Locker Lock

Model: 2254 / 2154

Date of Test: July 08, 2009

Contact person: Kevin Houlihan

Tel/ Fax: Tel: 203-743-2976/ Fax: 203-778-1006

2. EUT DESCRIPTION

| | |
|-------------------------------|--|
| Product | RF system Locker Lock |
| Model Name | 2254 / 2154 |
| Power Supply | DC 6 V (AA battery 4 pcs.) |
| Frequency of Operation | 13.56186 MHz |
| Transmit Power | 16.60 dBuV/m |
| Modulation Type | ASK |
| Manufacturer | PASSTECH CO., LTD. |
| Antenna Specification | Manufacturer: PASSTECH CO., LTD.. Antenna type: PCB Antenna |

The 2254 is chosen for full testing. Because it is worse case than the 2154.



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)

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 15.225 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.

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|----------------------------------|---------------------------------|-------------------------------|---------------------|--|
| HCT PT.15.225 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0734 | Date of Issue: July 28, 2009 | EUT Type: RFID Locker Lock | FCC ID: XLY-2254 | Page 4 of 14 |



3.5 STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance With
FCC Part 15.Subpart C

| Regulation | Measurement standard | Range |
|--|----------------------|---------------------------------------|
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(a) | ANSI C63.4:2003 | 13.553MHz to 13.567MHz |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(d) | ANSI C63.4:2003 | outside of the 13.110-14.010 MHz band |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209 | ANSI C63.4:2003 | 9kHz to 30MHz |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209 | ANSI C63.4:2003 | 30MHz to 1GHz |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.207 | ANSI C63.4:2003 | 150kHz to 30MHz |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(e) | ANSI C63.4:2003 | 0.01% of nominal |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.215(c) | ANSI C63.4:2003 | - |



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."

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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|----------------------------------|---------------------------------|-------------------------------|---------------------|--|
| HCT PT.15.225 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0734 | Date of Issue: July 28, 2009 | EUT Type: RFID Locker Lock | FCC ID: XLY-2254 | Page 6 of 14 |



7. TEST SUMMARY

The results in this report apply only to sample tested

| Regulation | Test Type | Range | Result |
|--|-----------------------------------|---|--------|
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(a) | Radiated Electric Field Emissions | 13.553MHz to 13.567MHz | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(b) | Radiated Electric Field Emissions | 13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(c) | Radiated Electric Field Emissions | 13.710MHz to 14.010MHz | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209 (d) | Radiated Electric Field Emissions | 9kHz to 30MHz | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209 | Radiated Electric Field Emissions | 30MHz to 1GHz | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.207 | AC power conducted emissions | 150kHz to 30MHz | N/A |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(e) | Frequency Stability | 0.01% of nominal | Pass |
| Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.215(c) | 20 dB Bandwidth | - | Pass |



8. RADIATED EMISSION MEASUREMENT

Requirement(s): 15.209, 15.225

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Minimum Standard: FCC Part 15.225 / 15.209

| Rule Part | Frequency (MHz) | Limit |
|--------------|-----------------|---------------------|
| Part 15. 209 | 0.009 ~ 0.490 | 2400/F(kHz)uV/m@300 |
| | 0.490 ~1.705 | 24000/F(kHz)uV/m@30 |
| | 1.705 ~ 30 | 30 uV/m@30 |
| | 30 ~ 88 | 100 ** uV/m@3m |
| | 88 ~ 216 | 150 ** uV/m@3m |
| | 216 ~ 960 | 200 ** uV/m@3m |
| | Above 960 | 500 uV/m@3m |

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

15.225 Operation within the band 13.110 – 14.010 MHz.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

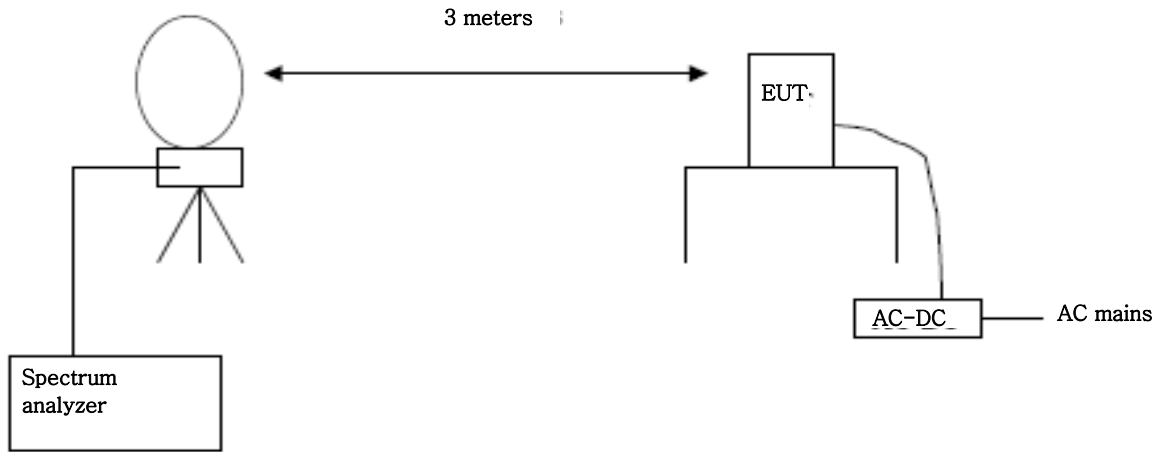
(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

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|----------------------------------|---------------------------------|-------------------------------|---------------------|--|
| HCT PT.15.225 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0734 | Date of Issue: July 28, 2009 | EUT Type: RFID Locker Lock | FCC ID: XLY-2254 | Page 8 of 14 |

8.1. Radiated Emission 9 kHz – 30 MHz

Test Set-up



Test Procedure

The EUT was placed on a non-conductive table located on a large open test site. The loop antenna was placed at a location 3m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna.

The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

Corrected Amplitude = Raw Amplitude(dB μ V/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

The spectrum analyzer is set to:

Frequency Range = 9 kHz ~ 1GHz

RBW = 9 kHz (9 kHz ~ 30MHz)
= 120 kHz (30 MHz ~ 1 GHz)

Trace Mode = max hold

Detector Mode = peak / Quasi-peak

Sweep time = auto



Test Results

| 13.553-13.567 MHz | | | | | | |
|-------------------|----------------------|---------------|--------------------------|---------------------------|--------------------|-------------|
| Frequency (MHz) | Read Level (dBuV)@3m | Factor (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 13.56186 | 46.69 | 9.91 | -40 | 16.60 | 84.00 | 67.40 |

| 9 kHz - 14.010 MHz | | | | | | |
|--------------------|----------------------|---------------|--------------------------|---------------------------|--------------------|-------------|
| Frequency (MHz) | Read Level (dBuV)@3m | Factor (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 1.61 | 23.21 | 11.10 | -40 | -5.69 | 23.47 | 29.16 |

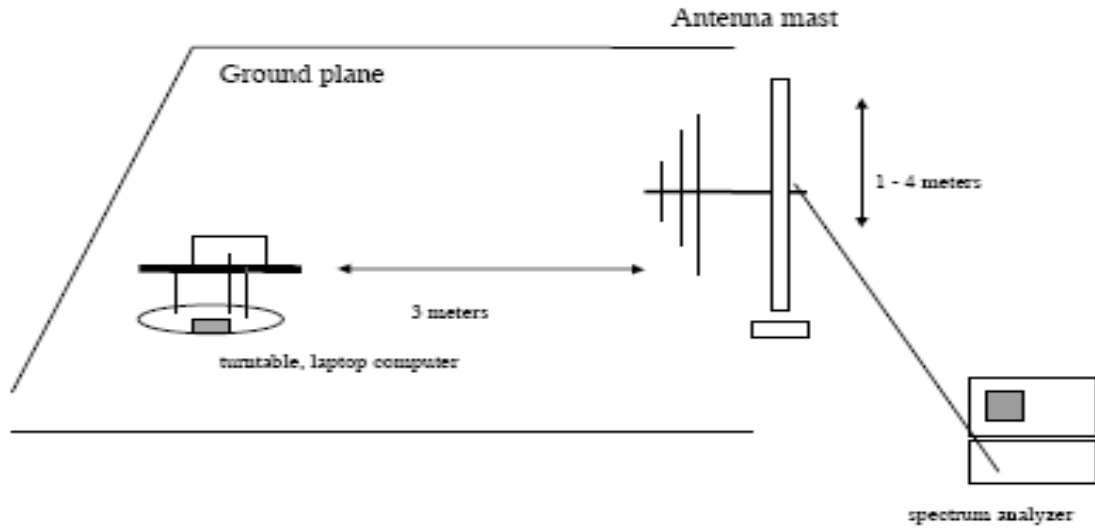
| 14.010 - 30 MHz | | | | | | |
|-----------------|----------------------|---------------|--------------------------|---------------------------|--------------------|-------------|
| Frequency (MHz) | Read Level (dBuV)@3m | Factor (dB/m) | Distance Correction (dB) | Result Level (dBuV/m)@30m | Limit (dBuV/m)@30m | Margin (dB) |
| 24.88 | 14.68 | 8.40 | -40 | -16.92 | 29.54 | 46.46 |

Remark :

1. Distance Correction Below 30MHz = $40\log(3m/30m) = -40$ dB Measurement Distance : 3 m (Below 30MHz)
2. Factor = Antenna Factor + Cable Loss
3. Result Level = Read Level + Factor + Distance Correction
4. Margin = Limit - Result Level

8.2. Radiated Emission 30 MHz – 1000 MHz

Test Set-up



Test Procedures: Radiated emissions were measured according to ANSI C63.4.

The EUT was set to transmit at the highest output power.

The EUT was set 3 meter away from the measuring antenna.

| Frequency MHz | Read Level dBuV | Antenna Factor dB/m | Cable Loss dB | ANT+CL Factor dB/m | ANT POL (H/V) | Result Level dBuV/m | Limit dBuV/m | Margin dB |
|------------------|-----------------------|---------------------------|------------------|--------------------------|------------------|---------------------------|-----------------|--------------|
| 32.0 | 13.9 | 12.2 | 1.3 | 13.5 | H | 27.4 | 40 | 12.6 |
| 115.0 | 9.9 | 10.6 | 2.6 | 13.2 | H | 23.1 | 43.5 | 20.4 |
| 190.0 | 16.0 | 9.5 | 3.3 | 12.8 | V | 28.8 | 43.5 | 14.7 |
| 217.0 | 15.7 | 9.8 | 3.5 | 13.3 | V | 29.0 | 46 | 17.0 |
| 246.0 | 21.2 | 11.0 | 3.8 | 14.8 | V | 36.0 | 46 | 10.0 |
| 273.0 | 11.4 | 11.8 | 4.0 | 15.8 | V | 27.2 | 46 | 18.8 |
| 299.0 | 17.4 | 12.6 | 4.2 | 16.8 | V | 34.2 | 46 | 11.9 |
| 353.0 | 15.2 | 13.9 | 4.5 | 18.4 | V | 33.6 | 46 | 12.4 |
| 408.0 | 15.3 | 15.1 | 4.7 | 19.8 | V | 35.1 | 46 | 10.9 |
| 435.0 | 16.1 | 15.9 | 4.9 | 20.8 | V | 36.9 | 46 | 9.2 |
| 488.0 | 15.5 | 16.7 | 5.2 | 21.9 | V | 37.4 | 46 | 8.6 |
| 544.0 | 10.8 | 17.8 | 5.5 | 23.3 | V | 34.1 | 46 | 11.9 |

Remark

1. ANT+CL Factor = Antenna Factor + Cable Loss
2. Result Level = Read Level + (ANT+ CL Factor)
3. Margin = Limit – Result Level

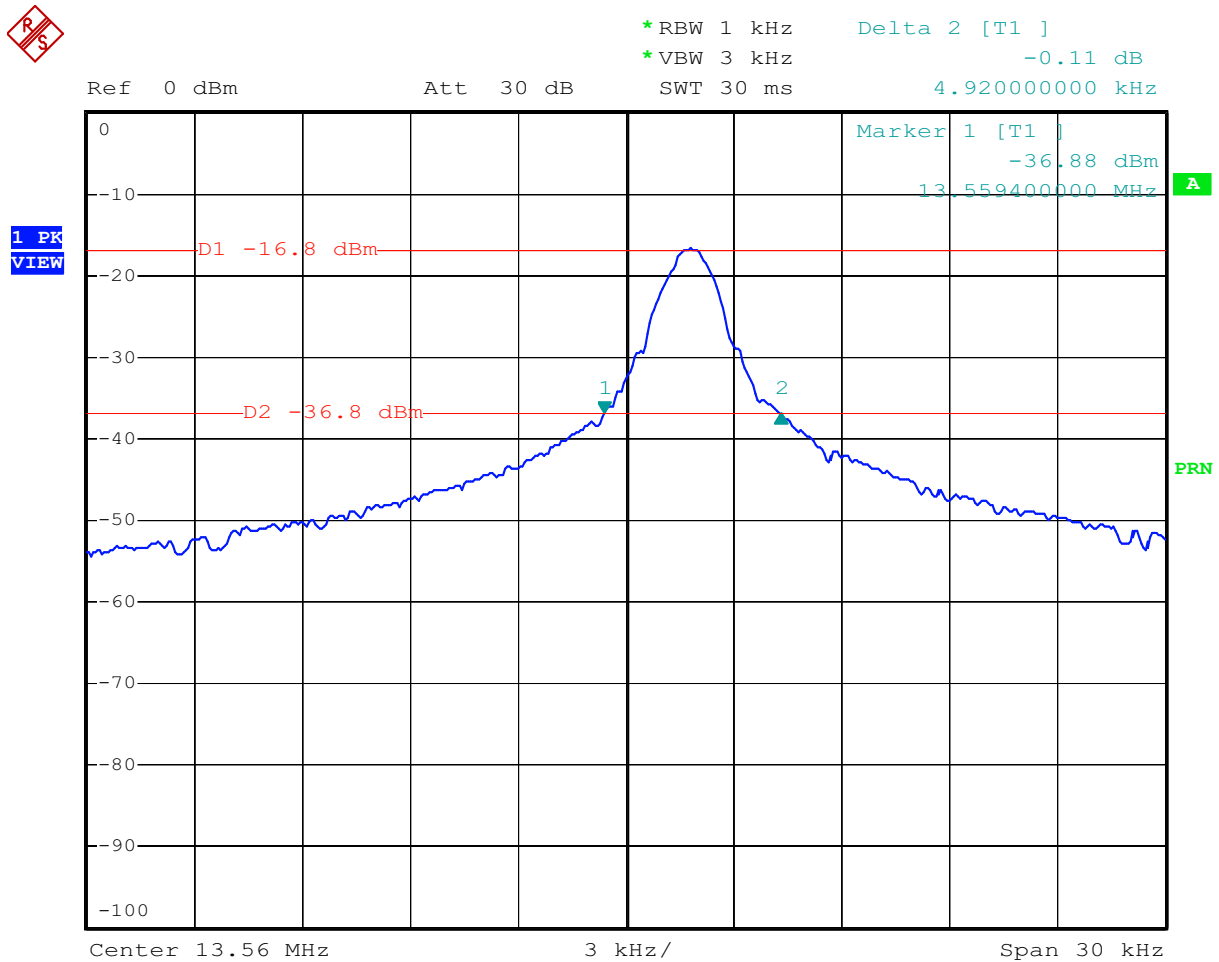


9. EMISSION BANDWIDTH PLOT.

Requirement(s):

Test Set-up: The EUT was connected to a spectrum analyzer.

Test Procedure: The 20dB bandwidth was measured by using a spectrum analyzer.



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|----------------------------------|---------------------------------|-------------------------------|---------------------|--|
| HCT PT.15.225 TEST REPORT | | FCC CERTIFICATION REPORT | | www.hct.co.kr |
| Test Report No. HCT-RF09-0734 | Date of Issue: July 28, 2009 | EUT Type: RFID Locker Lock | FCC ID: XLY-2254 | Page 1 2 of 14 |



10. FREQUENCY TOLERANCE

Procedure: Part 15.225, ANSI 63.4

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

- a) Temperature: The temperature is varied from -20°C to + 50°C using an environmental chamber.
- b) For battery operated equipment, the equipment tests shall be performed using a new battery.

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Measurement Result:

| VOLTAGE (%) | POWER | Temperature (°C) | Frequency (MHz) | Frequency Error (%) |
|-------------|-------|------------------|-----------------|---------------------|
| 100% | 6 V | -20 | 13.562000 | 0.001032 |
| 100% | | -10 | 13.561480 | 0.002801 |
| 100% | | 0 | 13.562200 | 0.002507 |
| 100% | | 10 | 13.561200 | 0.004866 |
| 100% | | 20 | 13.561860 | 0.000000 |
| 100% | | 30 | 13.561080 | 0.005751 |
| 100% | | 40 | 13.561080 | 0.005751 |
| 100% | | 50 | 13.562400 | 0.003982 |

Notes:

- 1. The EUT is supplied with the fully re-charged battery.



11. 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 | 07/31/2010 | 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 |
| Korea Eng | KR-1005L/ Temperature and Humidity Chamber | Annual | 12/31/2009 | KRAC05063-3CH |