



ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : E04OR-008

Applicant : Cybertree Co., Ltd.

Address : 546-9, Sang2-Dong, Wonmi-Gu, Bucheon-Si, Gyeonggi-Do Korea

Manufacturer : Cybertree Co., Ltd.

Address : 546-9, Sang2-Dong, Wonmi-Gu, Bucheon-Si, Gyeonggi-Do Korea

Type of Equipment : Breast Liner (Remocon)

FCC ID : RLRCWM300XBL3150R

Model Name : CWM-300R

Serial number : N/A

Total page of Report : 12 pages (including this page)

Date of Incoming : September 20, 2004

Date of Issuing : October 6, 2004


SUMMARY

The equipment complies with the requirements of FCC CFR 47 PART 15 SUBPART C, SECTION 15.231.


This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:


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ONETECH Corp.

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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : Cybertree Co., Ltd.
- ADDRESS : 546-9, Sang2-Dong, Wonmi-Gu, Bucheon-Si, Gyeonggi-Do Korea
- CONTACT PERSON : Mr. Beom Mo, Jeong / Director in R&D
- TELEPHONE NO : +82-32-327-4534
- FCC ID : RLRCWMXBL3150R
- MODEL NO/NAME : CWM-300R
- SERIAL NUMBER : N/A
- DATE : October 6, 2004

| | |
|---|---------------------------------------|
| DEVICE TYPE | Intentional Radiator |
| E.U.T. DESCRIPTION | Breast Liner (Remocon) - TRANSMITTER |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4: 2001 |
| TYPE OF EQUIPMENT TESTED | PRE-PRODUCTION |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | CERTIFICATION |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S) | FCC PART 15 SUBPART C, Section 15.231 |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | No |
| FINAL TEST WAS CONDUCTED ON | 3 METER OPEN AREA TEST SITE |

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



2. GENERAL INFORMATION

2.1 Product Description

The Cybertree Co., Ltd., Model CWM-300R (referred to as the EUT in this report) is a remote controller for Breast liner that is consist of a receiver and battery charger. The associated receiver is manufactured by Cybertree Co., Ltd., Model No: CWM-300B, FCC ID: RLRCWM300XBL3150B. The product specification described herein was obtained from product data sheet or user's manual.

| | |
|--|--|
| CHASSIS TYPE | Non-Metal |
| TX FREQUENCY | 315.0 MHz |
| MODULATION | ASK |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 9.84375 MHz, 4 MHz |
| ANTENNA TYPE | Built-in on the PCB in the EUT |
| TRANSMISSION TIME | Not longer than 1 sec |
| RATED SUPPLY VOLTAGE | DC 3V (CR2032 Type Battery) |
| NUMBER OF LAYERS | 2 Layers |
| FUNCTION OF BUTTON | Power On/Off and Mode Selection Button, Left/Right Selection Button, Vibration strength control Button |

Remark: This equipment automatically deactivates the transmitter within not more than 1 second of being released.

2.2 Model Differences:

The difference(s) compared to the EUT is as follows: None.

2.3 Related Submittal(s) / Grant(s)

-. None

2.4 Test System Details

The EUT was tested with the following all equipment used in the tested systems are: None.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4: 2001. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 18, 2002. (Registration Number: 92819)



3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

| DEVICE TYPE | MANUFACTURER | MODEL/PART NUMBER | FCC ID |
|-------------|---------------------|-------------------|--------|
| MAIN BOARD | Cybertree Co., Ltd. | CWM-300 Remote | N/A |

3.2 EUT exercise Software

To get a maximum radiated emission from the EUT, the button on the EUT was continuously pressed to transmit the signal. During the testing, the battery of the EUT was changed with a new battery.

3.3 Equipment Modifications

-. None

3.4 Configuration of Test System

Line Conducted Test: It needs not to test this requirement, because the EUT is operated by batteries.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2001 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer. The picture is taken at

50 kHz/division frequency span, 10 kHz resolution bandwidth and 10dB/division logarithmic display from an 8566B spectrum analyzer.



3.5 Antenna Requirement

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The transmitter antenna of the EUT is built-in on the PCB in the EUT, no consideration of replacement by the user.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

| Operation Mode | The Worse operating condition (Please check one only) |
|--|---|
| N/A | N/A |
| It is not need to test this requirement, because the power of the EUT is supplied from DC batteries. | |

4.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

| Operation Mode | The Worse operating condition (Please check one only) |
|----------------|---|
| TX mode | X |



5. FINAL RESULT OF MEASUREMENT

5.1 Field Strength of the Carrier Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 55 % Temperature: 28 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(b)
 Type of Test : Transmitter
 Result : PASSED BY -10.24 dB at Peak Mode

EUT : Breast Liner (Remocon) Date: September 1, 2004
 Operating Condition : TX mode
 Distance : 3 Meter

| Radiated Emissions | | | Ant | Correction Factors | | | Total | FCC Limit | |
|------------------------|---------------------|------------------|------|--------------------|---------------|-------------------------|------------------|-------------------|----------------|
| Carrier Freq. (MHz) | Amplitude (dBuV) | Detector Mode | Pol. | Ant. (dB/m) | Cable (dB) | Average Level Factor | Amp. (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 315.00 | 54.30 | Peak | H | 13.82 | 2.94 | 5.68 | 63.58 | 75.62 | -10.24 |
| 315.00 | 40.64 | Peak | V | 13.82 | 2.94 | 5.68 | 51.72 | 75.62 | -23.90 |

Remark: To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

5.2 Maximum Modulation Percentage (MMP)

In order to determine possible Maximum Modulation Percentage from the EUT, we measured the duty cycle according to the clause I4 (10) in ANSI C63.4: 2001.

The pulse train from the EUT was consisting of long and short pulse. The measured values are as follows.

| Long Pulse (LP) | Short Pulse (SP) | Total sum of LP | Total sum of SP | Pulse Width |
|------------------------------------|------------------|---|-----------------|-------------|
| 4.6ms | 2.4ms | 4 | 14 | 42.4 |
| Duty Cycle | | $(4 \times 4.6 + 14 \times 2.4) / 100 = 0.52$ | | |
| Maximum Modulation Percentage(MMP) | | Duty Cycle X 100 % = 52 % | | |
| Average Level Factor | | -5.68 dB | | |

Remark: Please refer to Plotted Data #1.

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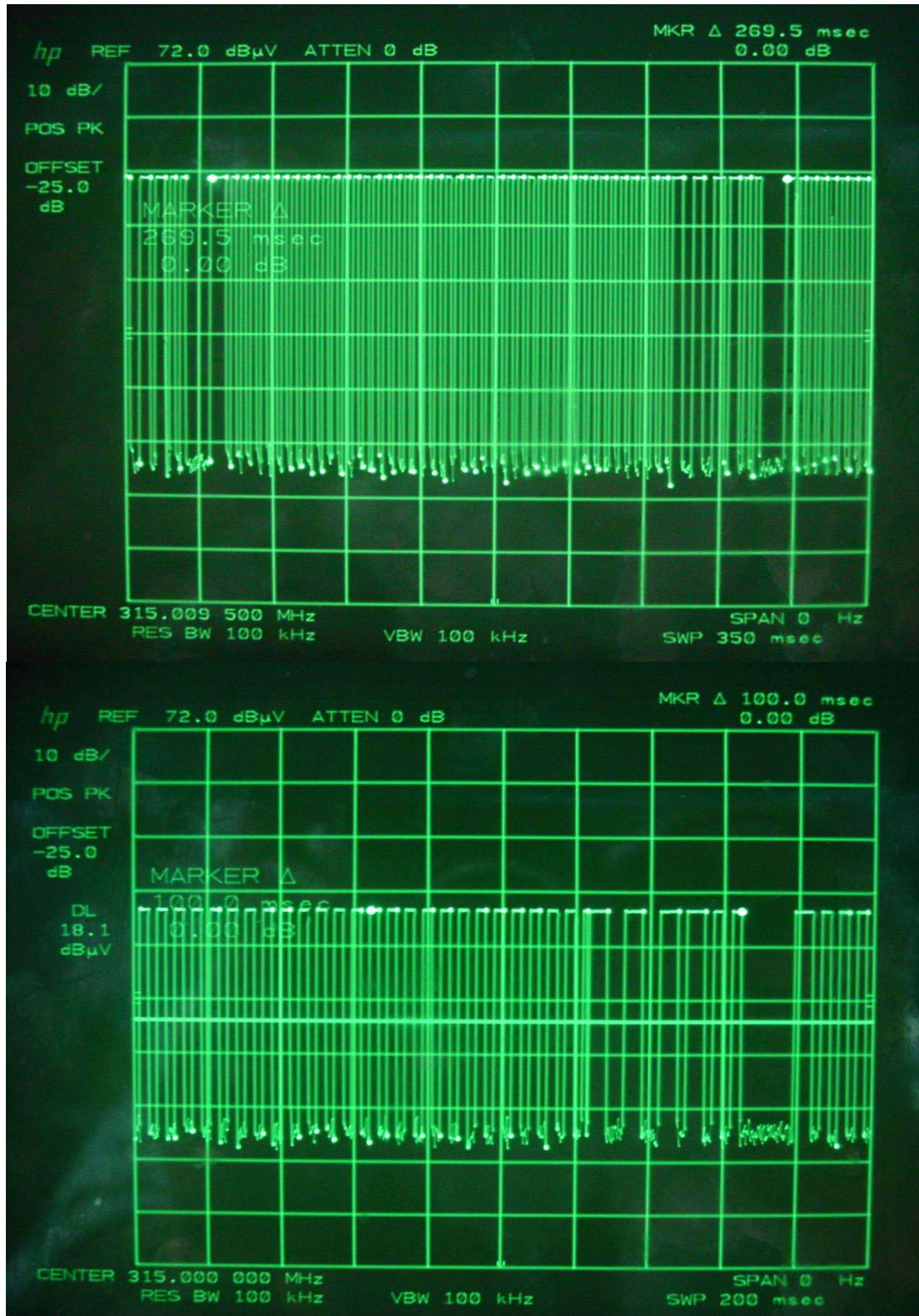
FCC ID. : RLRCWM300XBL3150R

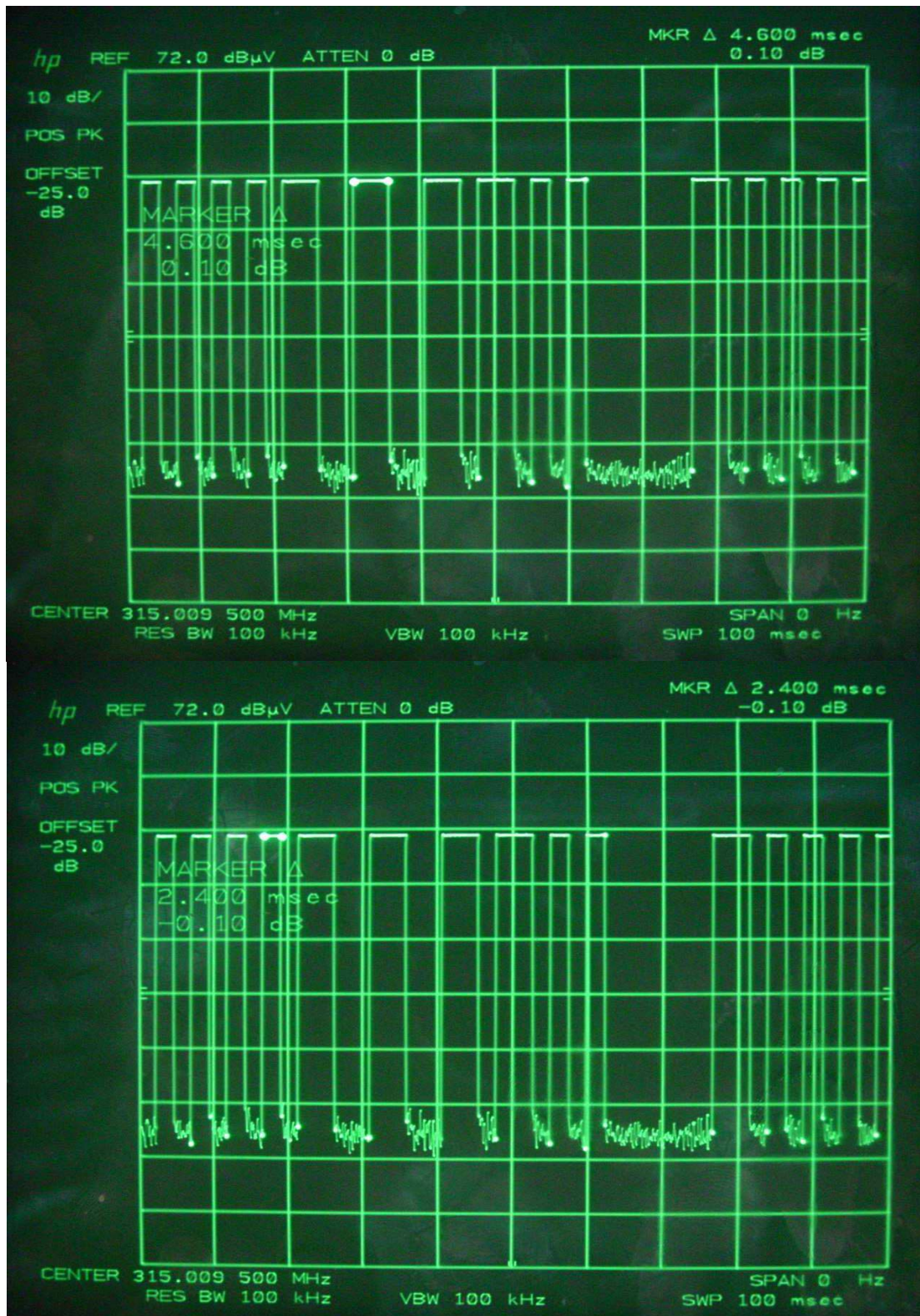
Report No. : E04OR-008

Tested by: Gi-Hong, Nam / Test Engineer



Plotted Data #1.





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FCC-004 (Rev.0)

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**5.2 Spurious Emission Test**

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 51 % Temperature: 28 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231(b)
 Type of Test : Transmitter
 Result : PASSED BY -9.55dB at 1575.05 MHz

EUT : Breast Liner (Remocon) Date: September 20, 2004
 Operating Condition : TX mode
 Detector : Below 1GHz, Quasi-Peak/Peak (RBW: 120 kHz)
 Above 1GHz, Average/Peak (RBW: 1MHz)
 Distance : 3 Meter

| Radiated Emissions | | | Ant | Correction Factors | | Total | FCC Limit(dBuV/m) | |
|---|------------------|------------------|------|--------------------|--------------------|--------------------------|-------------------|----------------|
| Freq. (MHz) | Pk Rdg (dBuV) | AV Rdg (dBuV) | Pol. | Antenna (dB/m) | Cable Loss (dB) | Amp. at Peak (dBuV/m) | Limit | Margin (dB) |
| 630.00 | 18.90 | - | H | 19.09 | 4.16 | 42.15 | 55.62 | -13.47 |
| 944.99 | 15.50 | - | H | 22.82 | 5.24 | 43.56 | 55.62 | -12.06 |
| 1260.05 | 10.60 | - | H | 24.58 | 5.33 | 40.51 | 55.62 | -15.11 |
| 1575.05 | 15.60 | - | H | 24.95 | 5.52 | 46.07 | 55.62 | -9.55 |
| Other spurious frequencies were not found up to 4000 MHz. | | | | | | | | |

Remark: To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

“Pk Rdg” : Peak Measurement, “H”: Horizontal Polarization, “V”: Vertical Polarization

Tested by: Gi-Hong, Nam / Test Engineer

**5.4 Bandwidth of the operating frequency**

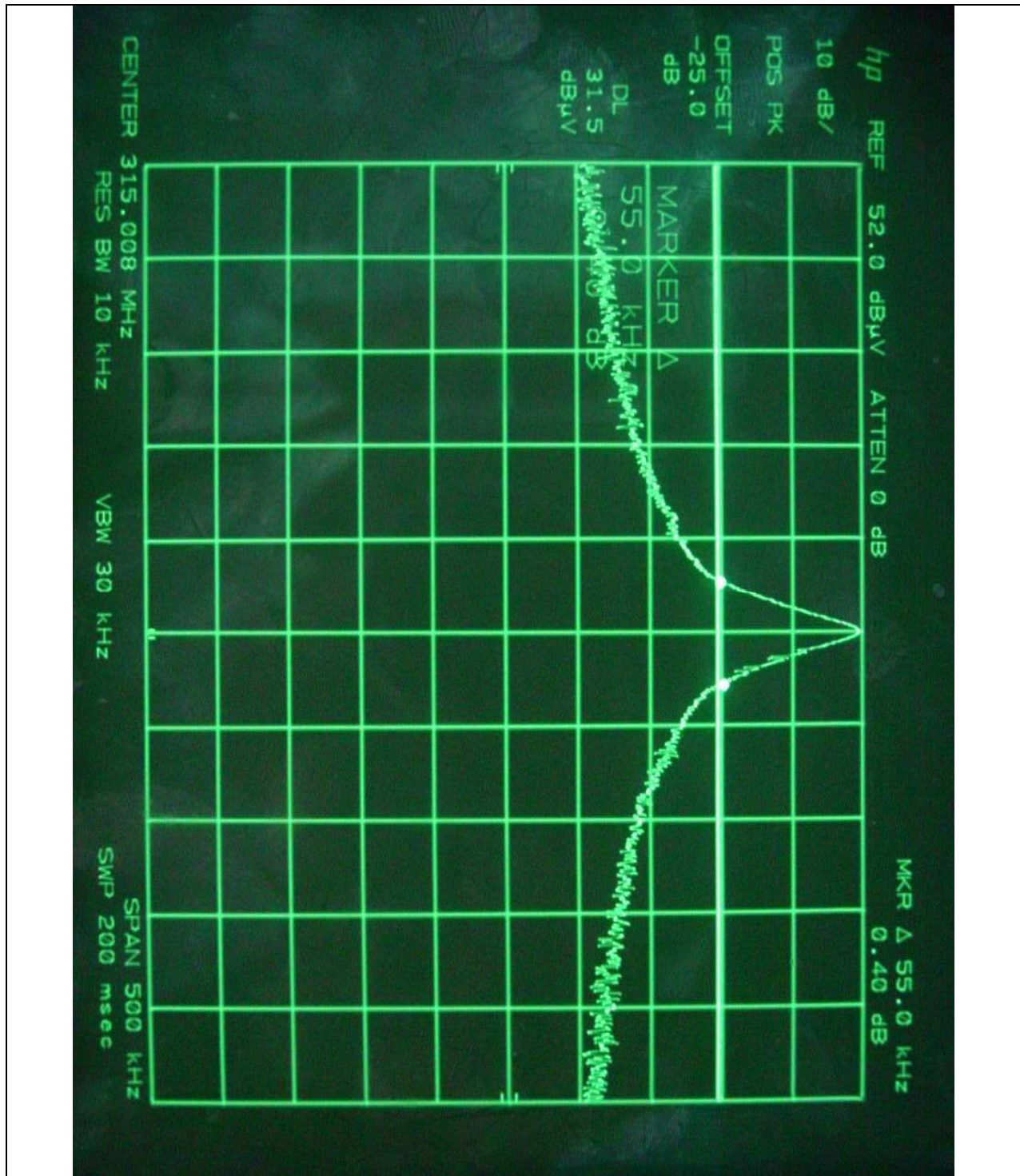
Humidity Level : 43 % Temperature: 21 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.231 (c)
Type of Test : Transmitter
Result : PASSED

EUT : Breast Liner (Remocon) Date: September 20, 2004
Operating Condition : TX mode
Minimum Resolution
Bandwidth : 10 kHz

| Carrier Freq. (MHz) | Bandwidth of the emission. (kHz) | Limit (kHz) | Remark |
|------------------------|-------------------------------------|-------------------------------|---|
| 315 | 55.0 | $315.0 \times 0.25\% = 787.5$ | <u>The point 20dB down from the modulated carrier</u> |

Please refer to next page for pictured graph.

Tested by: Gi-Hong, Nam / Test Engineer





6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**7. LIST OF TEST EQUIPMENT**

| No. | EQUIPMENTS | MFR. | MODEL | SER. NO. | LAST CAL | DUE CAL | USE |
|-----|-----------------------|---------------|-------------|-------------|----------|---------|-----|
| 1. | Test receiver | R/S | ESVS 10 | 827864/005 | NOV/03 | 12MONTH | ■ |
| 2. | Test receiver | R/S | ESHS10 | 834467/007 | APR/04 | 12MONTH | ■ |
| 3. | Spectrum analyzer | HP | 8567A | 3021A00773 | JUL/04 | 12MONTH | ■ |
| 4. | RF preselector | HP | 85685A | 3107A01268 | JUL/04 | 12MONTH | ■ |
| 5. | Quasi-Peak Adapter | HP | 85650A | 3107A01550 | JUL/04 | 12MONTH | ■ |
| 6. | Biconical antenna | EMCO | 3104C | 9109-4443 | MAY/04 | 12MONTH | |
| 7. | | | | 9109-4444 | JUL/04 | | |
| 8. | | Schwarzbeck | VHA9103 | 91031852 | JAN/04 | | ■ |
| 9. | Log Periodic antenna | EMCO | 3146 | 9109-3213 | AUG/04 | 12MONTH | |
| 10. | | | | 9109-3214 | JUL/04 | | |
| 11. | | | | 9109-3217 | MAY/04 | | |
| 12. | | Schwarzbeck | 9108-A(494) | 62281001 | JAN/04 | | ■ |
| 13. | Plotter | HP | 7475A | 30052 22986 | N/A | N/A | ■ |
| 14. | Position Controller | HD | HD100 | 100/788 | N/A | N/A | ■ |
| 15. | Turn Table | HD | DS420S | N/A | N/A | N/A | ■ |
| 16. | Antenna Master | HD | HD240 | N/A | N/A | N/A | ■ |
| 17. | Isolation Transformer | Digitek Power | DPT | DPF-22027 | N/A | N/A | ■ |
| 18. | Isolation Transformer | Digitek Power | DPT | DPF-22028 | N/A | N/A | ■ |
| 19. | Frequency Converter | Digitek Power | VFS/DEFC | N/A | N/A | N/A | ■ |