



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

Test report file number : E02NR-032

Applicant : MOVOTEC INC.

Address : 4 Ma 606 Sihwa Industrial Complex, 7158 Sunggok-Dong, Danwon-Gu, Ansan-Si, Gyeonggi-Do
Korea

Manufacturer : GMD Korea, Inc.

Address : 4 Ma 606 Sihwa Industrial Complex, 7158 Sunggok-Dong, Danwon-Gu, Ansan-Si, Gyeonggi-Do
Korea

Type of Equipment : Wire & Wireless Universal Hands Free Kit

FCC ID. : QQWMV-01

Model / Type No. : SayFree

Serial number : N/A

Total page of Report : 15 pages (including this page)

Date of Incoming : November 07, 2002

Date of issuing : November 14, 2002

SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C §15.239**

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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FCC-003 (Rev.0)

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ONETECH

Testing & Evaluation Lab.

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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : MOVOTEC INC.
- ADDRESS : 4 Ma 606 Sihwa Industrial Complex, 715-8 Sunggok-Dong, Danwon-Gu, Ansan-Si, Gyunggi-Do Korea
- CONTACT PERSON : Mr. Chun-Jeong Lee / General Manager
- TELEPHONE NO : +82-31-319-6122
- FCC ID : QQWMV-01
- MODEL NO/NAME : SayFree
- SERIAL NUMBER : N/A
- DATE : November 14, 2002

DEVICE TYPE	Low Power Communication Device Transmitter -Intentional Radiator
E.U.T. DESCRIPTION	Wire & Wireless Universal Hands Free Kit
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15.239 SUPART C
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 MOVOTEC INC., Model SayFree (referred to as the EUT in this report) is a Wire & Wireless Universal Hands Free Kit that can transmit 88.1MHz, 88.3MHz, 88.5MHz, 88.7MHz, and 88.9MHz for audio signal to FM radio receiver. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	7.6 MHz
POWER REQUIREMENT	DC 12V from Car Battery
TRANSMITTING FREQUENCY	88.1, 88.3, 88.5, 88.7 and 88.9MHz
EXTERNAL TERMINALS	Earphone Jack and DC Power Jack

Model Differences:

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

2.2 Related Submittal(s) / Grant(s)

Original submittal only

2.3 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
SayFree	MOVOTEC INC.	QQWMV-01	Wire & Wireless Universal Hands Free Kit(EUT)	-
N/A	N/A	N/A	Earphone	EUT
3033B	B&J TMI Corp..	N/A	DC Power Supply	EUT

2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in chapter 13 of ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.



2.5 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	MOVOTEC INC.	N/A	N/A

3.2 EUT exercise Software

The audio input port was connected to the audio generator and then the generator sent 1 kHz signal to the EUT.

The EUT continuously transmitted the signal for the purpose of the measurements.

3.3 Cable Description

Product Name	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Wire & Wireless Universal Hands Free Kit(EUT)	N	N	1.2(P), 1.6(S)
EARPHONE	N	N	1.6(S)
DC POWER SUPPLY	N	N	1.8(P), 1.2(S)

* The marked "(S)" means the Signal Cable and "(P)" means the Power Cable.

3.4 Noise Suppression Parts on Cable

Product Name	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Wire & Wireless Universal Hands Free Kit(EUT)	N	N/A	N	N/A
DC POWER SUPPLY	N	N/A	Y	BOTH END
EARPHONE	N	N/A	Y	EUT END



3.5 Equipment Modifications

To achieve compliance to FCC part 15 rules, the following change(s) was made by ONETECH Corp. during compliance testing:

“There was no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test: It needs not to test this requirement, because the EUT operated by a car battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4/1992 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 plot is taken at 30kHz/division frequency span, 10kHz resolution bandwidth and 5dB/division logarithmic display from an 8568B spectrum analyzer.

3.7 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 FM transmitter antenna of the EUT is built-in on the main board of the EUT, no consideration of replacement by the user.



4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

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

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

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

**5. FINAL RESULT OF MEASUREMENT****5.1 Radiated Emission Test****5.1.1 Within the permitted 200kHz band**

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

Humidity Level : 51 % Temperature : 16 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239
 Type of Test : Low Power Communication Device Transmitter

EUT : Wire & Wireless Universal Hands Free Kit Date: November 28, 2002
 Operating Condition : FM TX MODE
 Distance : 3 Meter
 Detector : Peak Detector Mode: RBW: 100kHz, VBW: 300kHz
 Average Detector Mode: RBW: 10kHz, VBW: 10kHz

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.5	34.60	Peak	H	8.19	1.10	43.89	47.96	-4.07
88.5	24.81	Peak	V	8.19	1.10	34.10	47.96	-13.86

Radiated Emission Tabulated Data


 Tested by: Dan-Gi, Lee / Test Engineer



5.3 Bandwidth of the operating frequency

Humidity Level : 49 % Temperature : 19 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239
Result : PASSED

EUT : Wire & Wireless Universal Hands Free Kit Date: November 12, 2002
Operating Condition : FM TX MODE
Minimum Resolution
Bandwidth : 10 kHz

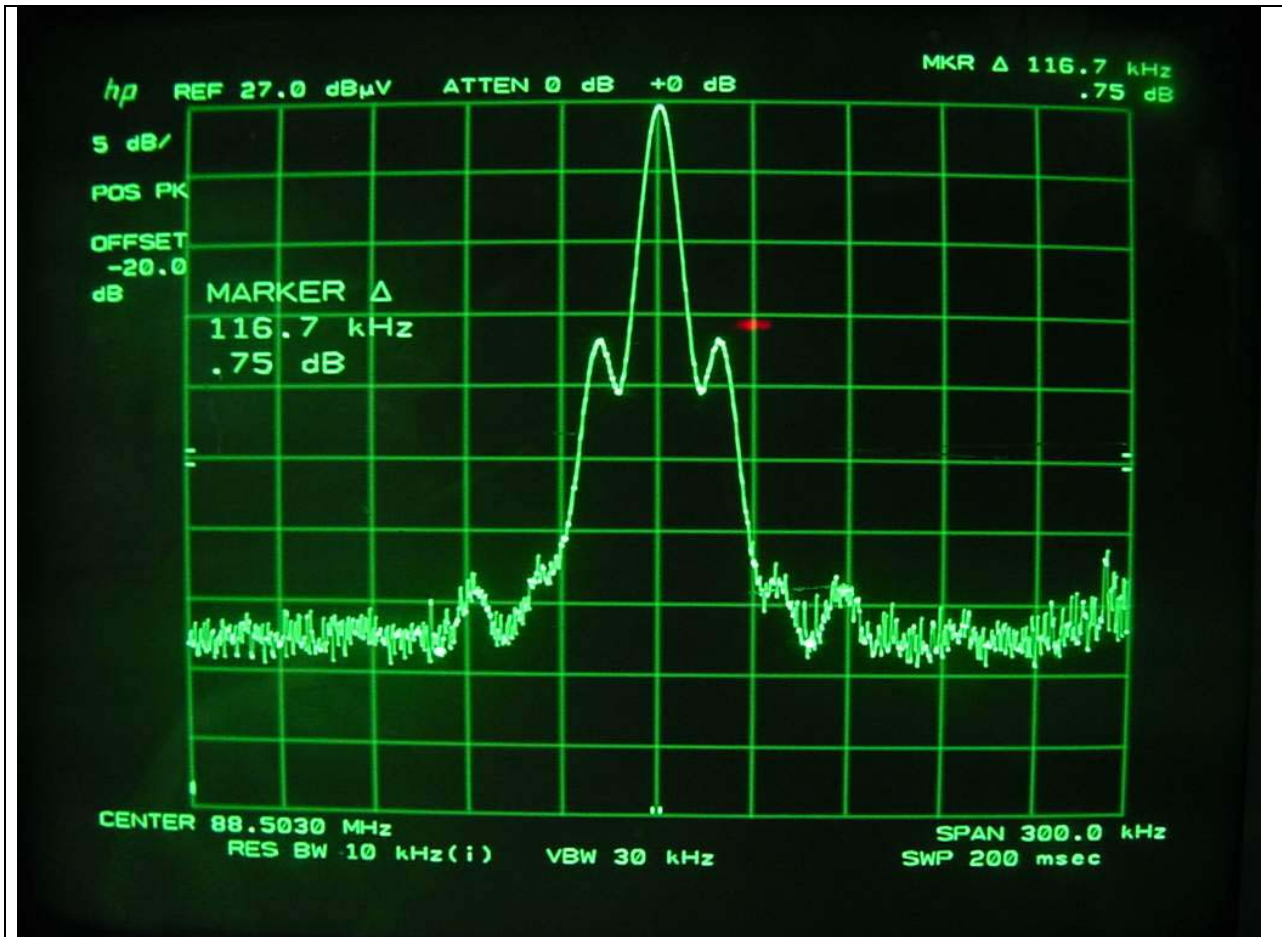
Remark: Please see following pages of plotted data marked the bandwidth of 200kHz points.



Tested by: Dan-Gi, Lee / Test Engineer



Bandwidth Test Data





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	OCT/02	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/02	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3109A05456	APR/02	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	APR/02	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	APR/02	12MONTH	■
6.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	APR/02	12MONTH	■
7.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	APR/02	12MONTH	■
8.	LISN	EMCO	3825/2	9109-1867 9109-1869	JUL/02	12MONTH	■
9.	Computer System	HP	98581C	98543A	N/A	N/A	■
	Hard disk drive		9153C	CMC762Z9153	N/A	N/A	■
10.	Plotter	HP	7475A	30052 22986	N/A	N/A	■
11.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
12.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
13.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■