TEST REPORT

OF

FCC Part 15 Subpart C §15.209

FCC ID: URT36-414-600

Equipment Under Test	:	SMK MSCL
Model Name	:	HUF-SMKREN
Serial No.	:	N/A
Applicant	:	Huf Korea Co., Ltd.
Manufacturer	:	Huf Korea Co., Ltd.
Date of Test(s)	:	2006-10-30 ~ 2006-11-03
Date of Issue	:	2006-11-10

In the configuration tested, the EUT complied with the standards specified above.

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

Tested By: **Feel Jeong** **Date** **2006-11-10**

Approved By **Albert Lim** **Date** **2006-11-10**

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1. General Information

1.1. Testing Laboratory

SGS Testing Korea Co., Ltd.
Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-Si, Gyeonggi-do, Korea 435-040
www.electrolab.kr.sgs.com
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371

1.2. Details of Applicant

Applicant : Huf Korea Co., Ltd.
Address : 710 Baeksuk-dong, Chonan, Chungnam, Korea
Contact Person : Sang Hyun Lee
Phone No. : +82 +41 559 6452
Fax No. : +82 +41 621 4953

1.3. Description of EUT

Kind of Product	SMK MSCL
Model Name	HUF-SMKREN
Serial Number	N/A
Power Supply	DC 12 V
Frequency Range	125 kHz(Tx / Rx)
Modulation Technique	ASK(Tx / Rx)
Frequency Generation	X-Tal
Number of Channels	1 CH(Tx / Rx)
Operating Conditions	-20 ℃ ~ +60 ℃
Antenna Type	Fixed Type(Loop Coil Antenna)

1.4. Details of modification

-N/A

1.5. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.	EQPT. USED
Spectrum Analyzer	Agilent	E4440A	May 2007	
Spectrum Analyzer	H.P	8565E	Dec. 2006	V
Loop Antenna	Rohde & Schwarz	HFH2-Z2	Sep. 2007	V
Ultra-Broadband Antenna	Rohde & Schwarz	HL562	Oct. 2007	V
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2007	V
Test Receiver	Rohde & Schwarz	ESHS10	Jun. 2007	
Test Receiver	Rohde & Schwarz	ESVS10	May 2007	
Test Receiver	Rohde & Schwarz	ESU26	Aug. 2007	V
Anechoic Chamber	SY Corporation	L x W x H 9.6 x 6.4 x 6.4	Jun. 2008	V

1.6. Summary of Test Results

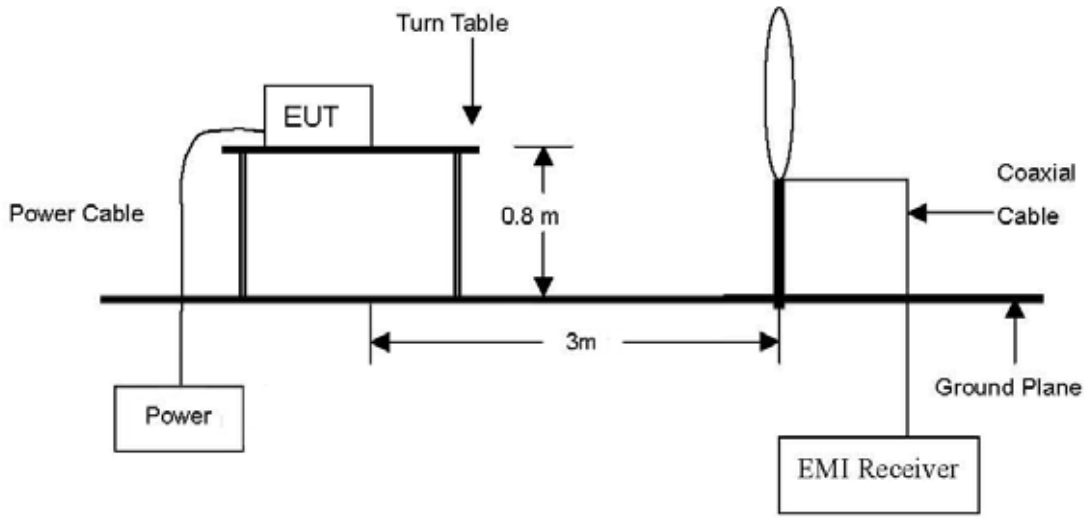
The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part15, Subpart C		
Standard Section	**Test Item**	**Result**
15.209(a)	Field Strength of Fundamental	PASS

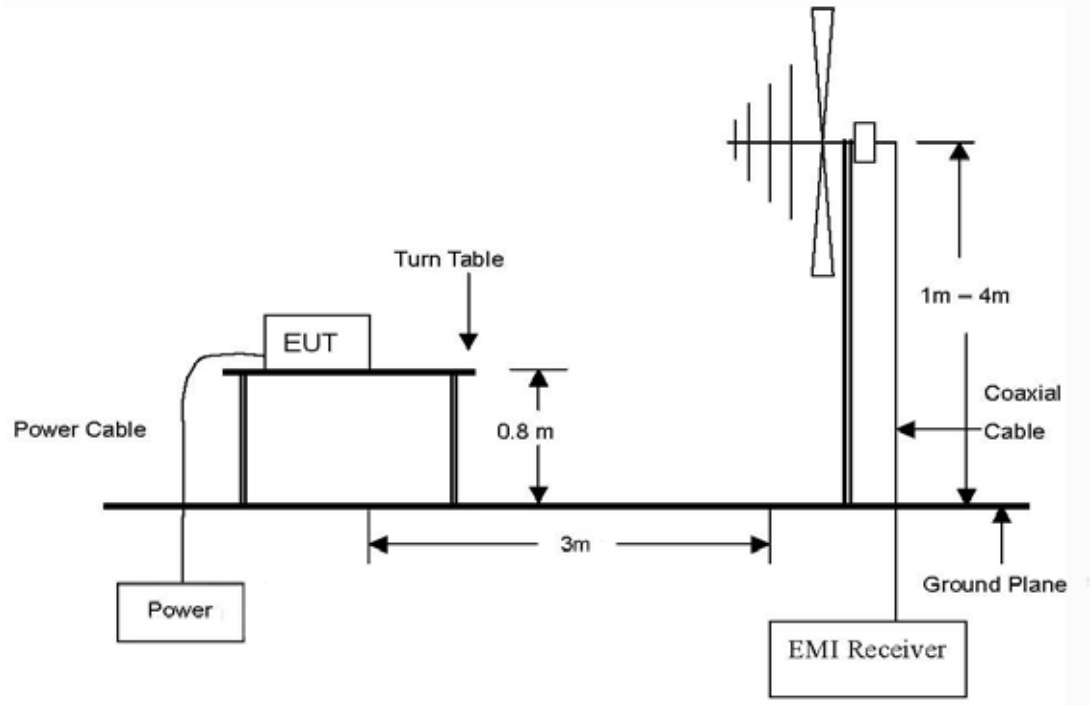
2. Field Strength of Fundamental

2.1. Test Setup

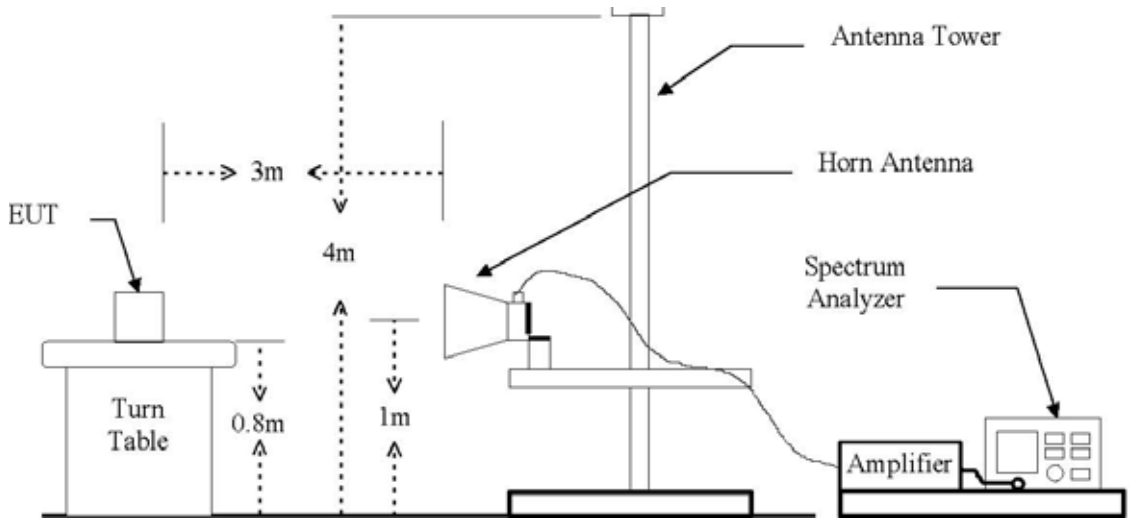
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz Emissions.



2.2. Limit

2.2.1. Radiated emission limits, general requirements

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	2400/F(kHz)	30
1.705 – 30.0	30	30
30 -88	100**	3
88 -216	150**	3
216 - 960	200**	3
Above 960	500	3

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

2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

2.3.1. Test Procedures for emission from 9 kHz to 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

2.3.2. Test Procedures for emission from 30 MHz to 1000 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

2.4. Test Result

Ambient temperature : 22 ℃ Relative humidity : 43 %

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

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Actual (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
0.125	65.41	Peak	H	20	0.01	85.42	105.7	20.28

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

Note:
1. A Peak limit is 20 dB above the average limit.
2. 3 m Limit(dBuV/m) = $20\log(2400/F_{(KHz)})+40\log(300/3)$
   $= 20\log(2400/125)+40\log(300/3)$
   $= 25.67+80$
   $= 105.7$

3. Spurious Emission

3.1. Test Setup

Same as section 2.1 of this report

3.2. Limit

Same as section 2.2 of this report

3.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

3.3.1. Test Procedures for emission from 9 kHz to 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
c. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
d. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.3.2. Test Procedures for emission from 30 MHz to 1000 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

3.4. Test Result

Ambient temperature : 22 ℃ Relative humidity : 43 %

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

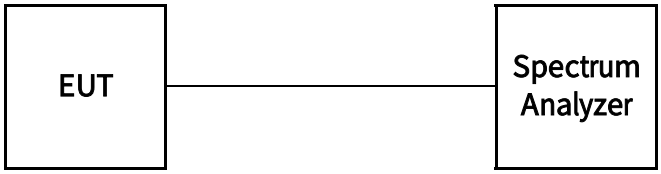
Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
0.375	29.02	Peak	H	20/0.01	-	49.03	96.12	47.09
0.627	21.09	Peak	H	20/0.01	-	41.10	51.66	10.56
0.878	14.60	Peak	H	20/0.01	-	34.61	48.73	14.12
Above 1	Not Detected							

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

Note:
1. A Peak limit is 20 dB above the average limit.
2. Other Spurious Frequencies were not detected up to 1000 MHz.

4. Bandwidth of Operation Frequency (Not Applicable)

4.1. Test Setup



4.2. Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

4.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using BBW=1 kHz, VBW=1 kHz and Span=500 kHz.
3. The bandwidth of fundamental frequency was measured and recorded.

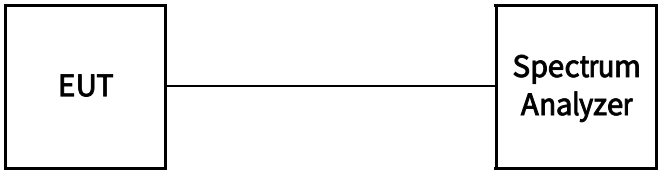
4.4. Test Result (Not Applicable)

Ambient temperature : - ℃ Relative humidity : - %

Carrier Frequency	Bandwidth of the emission (kHz)	Limit (kHz)	Remark
-	-	-	The point 20 dB down from the modulated carrier

5. Transmission Time (Not Applicable)

5.1. Test Setup



5.2. Limit

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

5.3. Test Procedure

1. The transmitter output is connected to the spectrum analyzer.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using BBW=1 kHz, VBW=1 kHz, Span=0 Hz, Sweep Time=5 sec
3. The bandwidth of fundamental frequency was measured and recorded.

5.4. Test Result (Not Applicable)

Ambient temperature : - ℃ Relative humidity : - %

Carrier Frequency	Bandwidth of the emission (sec)	Limit (sec)	Remark
-	-	-	-

Appendix A. Photo of Field Strength & Spurious Emission Test