

TEST REPORT

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NO.616 QINGQING ROAD,THE DISTRICT B,ZHENHAI ECONOMIC
DEVELOPMENT ZONE,NINGBO CHINA

Sample Description

Product : key finder
Model No. : KF01-02
Electrical Rating : DC 3V
FCC ID : 2ACNS-KF01-02

Date Received : 25 June 2014

Date Test Conducted : 25 June 2014 – 15 July 2014

Test standards : FCC Part 15: 2013 Subpart B

Test Result : Pass


Conclusion : The submitted samples complied with the above rules/standards.


Remark : None.

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16 July 2014 *Date*

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Report No.: 140609158GZU-002
Issued: 2014-7- 16

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TEST RESULTS SUMMARY

Classification of EUT: Class B

Test Item	Standard	Result
Conducted disturbance voltage at mains ports	FCC Part 15: 2013, Subpart B	N/A
Radiated emission (30 MHz–1 GHz)	FCC Part 15: 2013, Subpart B	Pass
Radiated emission (Above 1 GHz)	FCC Part 15: 2013, Subpart B	Pass
Remark: Reference publication is used for methods of measurement: ANSI C63.4:2009		

Remark: 1. The symbol “N/A” in above table means Not Applicable.

2. When determining the test results, measurement uncertainty of tests has been considered.



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Test Results Conclusion (with Justification)

RE: EMC Testing Pursuant to FCC Part 15, Subpart B Performed On the key finder, Model: KF01-02

We tested the key finder, Model: KF01-02, to determine if it was in compliance with the relevant FCC rules as marked on the Test Results Summary. We found that the unit met the requirement of FCC Part 15, Subpart B when tested as received. The worst case's test data was presented in this test report.

The equipment under test (EUT) is controlled by a remote controller; the controller is an intentional radiator using 315MHz frequency.

The controller option of this receiver is subject to Certification procedure.

The production units are required to conform to the initial sample as received when the units are placed on the market.

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LABORATORY MEASUREMENTS

Configuration Information

Equipment Under Test (EUT):	key finder
Model:	KF01-02
Serial No.	Not Labeled
Support Equipment:	N/A
Rated Voltage:	DC 3V
Condition of Environment:	Temperature : 22~28°C Relative Humidity: 35~60% Atmosphere Pressure 86~106kPa

Notes:

The EMI measurements had been made in the operating mode producing the largest emission in the frequency band being investigated consistent with normal applications.

An attempt had been made to maximize the emission by varying the configuration of the EUT.

All of the tests are performed at:
Shenzhen EMTEK Co., Ltd.

Bldg 69,Majialong Industry Zone, Nanshan District, Shen Zhen, Guangdong, 518052 China

This test facility and site measurement data have been fully placed on file with the FCC, test firm registration number is 709623.

4 TEST RESULTS

4.1 Conducted Disturbance Voltage at mains ports

Test Result: Not Applicable

Remark: This EUT is power by battery

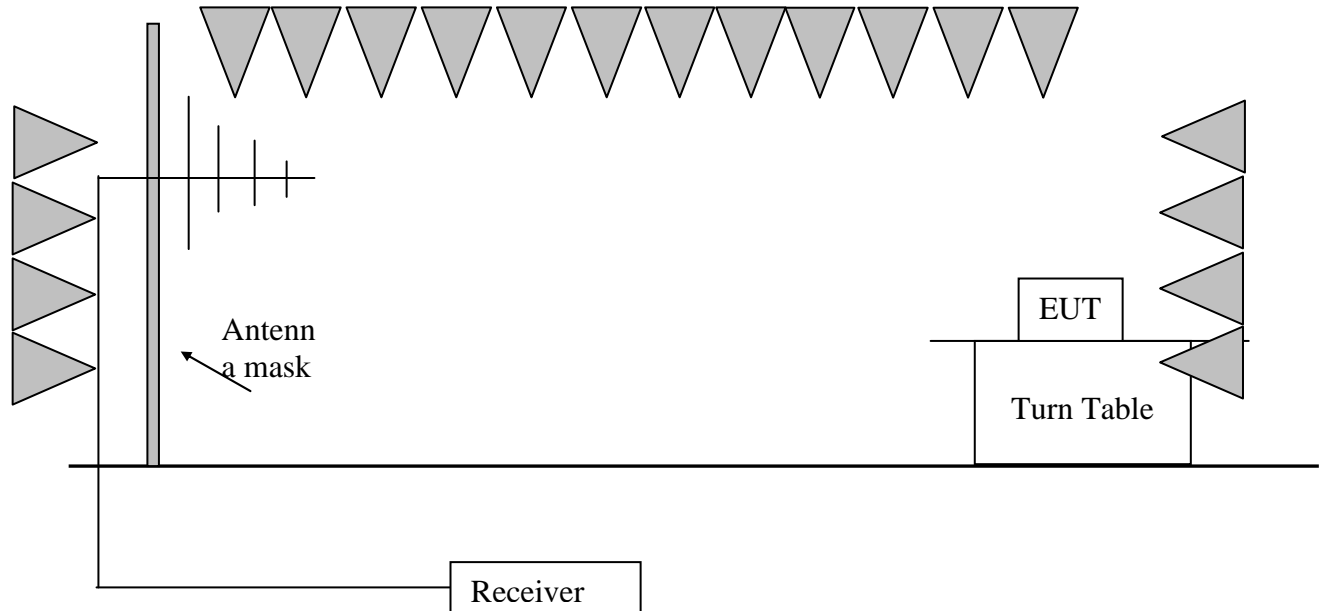
4.2 Radiated Emission (30 MHz -2000 MHz)

Test Result: Pass

4.2.1 Used Test Equipment

Equipment No.	Equipment	Model	Manufacturer
101414	EMI Test Receiver	ESCI	R&S
22013	Pre-Amplifier	PAP-0203	CD
DS1311159163660	Bilog Antenna(30M-3GHz)	VULP9163	Schwarzbeck /DE
531998	RF CABLE 2M	214/U 50 OHM	HUBER+SUHNER
C37001	RF CABLE 0.5M	SS540	HUBER+SUHNER
10051588	RF CABLE 6.5M	A05-01-01-6.5M	MIcable Inc
414	RF CABLE 1M	SAC-40G-1	A.H
MY14871/4	RF CABLE 1.5M	SUCOFLEX104	HUBER+SUHNER
3#	3m Semi-anechoic Chamber	966	SAEMC
1166.5950K03-101384Bw	EMI Test Receiver	ESCI3	Rohde & Schwarz
10051588	RF CABLE 6.5M	A05-01-01-6.5M	MIcable Inc
MY14871/4	RF CABLE 1.5M	SUCOFLEX104	HUBER+SUHNER
100319-21410500	Cable	CBL3-NN-10.5m	H+B
100319-21412500	Cable	CBL3-NN-12.5m	H+B
DS1311159120E1178	Horn Antenna(1G-18GHz)	BBHA9120D	Schwarzbeck /DE
J1011131010001	Pre-Amplifie(1G-18GHz 48dB)	LNA1G18-48	Lunar EM
#2	3m Semi-anechoic Chamber	966	SAEMC

4.2.2 Block Diagram of Test Setup



4.2.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

→ $FS = RA + \text{Correct Factor}$

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
Correct Factor = AF + CF – AG

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

$$FS = RA + \text{Correct Factor}$$

4.2.4 Test Setup and Procedure

The measurement was applied in a 3 m semi-anechoic chamber. The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mask. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

Broadband antenna was used as receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 requirement during radiated test. The bandwidth setting on R&S Test Receiver was 120 kHz for 30MHz-1GHz. The bandwidth setting on R&S Test Receiver was 1 MHz for above 1GHz.

Radiated emissions from an ITE shall be measured from the lowest frequency generated, or used, in the device or 30 MHz, whichever is higher, up to the frequency determined in accordance with Table following:

Frequency Range of Measurement

Highest Frequency Generated or Used in Device	Upper Frequency of Radiated Measurement
Below 1.705 MHz	30MHz
1.705 MHz – 108 MHz	1 GHz
108 MHz – 500 MHz	2 GHz
500 MHz – 1 GHz	5 GHz
Above 1 GHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower.
At transitional frequencies the lower limit applies.	

The frequency range from 30MHz to 2000MHz was checked.

4.2.5 Limit

Radiated emissions from an unintentional radiator, including a digital device shall be measured from the lowest frequency generated, or used, in the device or 30 MHz, whichever is higher, up to the frequency determined in accordance with Table following:

Class B limit at 3m test distance:

Frequency range MHz	Field strength dB (μV/m)
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
Above 960	54.0
At transitional frequencies the lower limit applies.	

4.2.6 Test Data

Radiated Emissions Pursuant to FCC 15.109: Emissions Requirement: 30MHz-2GHz

Polarization	Frequency (MHz)	QP Reading (dBμV)	Correction factor (dB/m)	QP Net at 3m (dBμV/m)	QP Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	43.58	-0.46	17.91	17.45	40.00	-22.55
Horizontal	109.54	0.93	12.76	13.69	43.50	-29.81
Horizontal	536.34	0.88	21.30	22.18	46.00	-23.82
Horizontal	655.65	1.32	23.14	24.46	46.00	-21.54
Horizontal	827.34	3.62	24.76	28.38	46.00	-17.62
Horizontal	910.76	4.27	26.79	31.06	46.00	-14.94
Vertical	43.58	-0.56	17.91	17.35	40.00	-22.65
Vertical	103.72	4.12	12.88	17.00	43.50	-26.50
Vertical	276.38	0.15	15.10	15.25	46.00	-30.75
Vertical	433.52	2.40	17.80	20.20	46.00	-25.80
Vertical	641.10	1.50	22.82	24.32	46.00	-21.68
Vertical	789.50	0.60	25.14	25.74	46.00	-20.26

Notes: 1. Quasi-peak detector was used at below 1GHz, peak detector was used at above 1GHz.

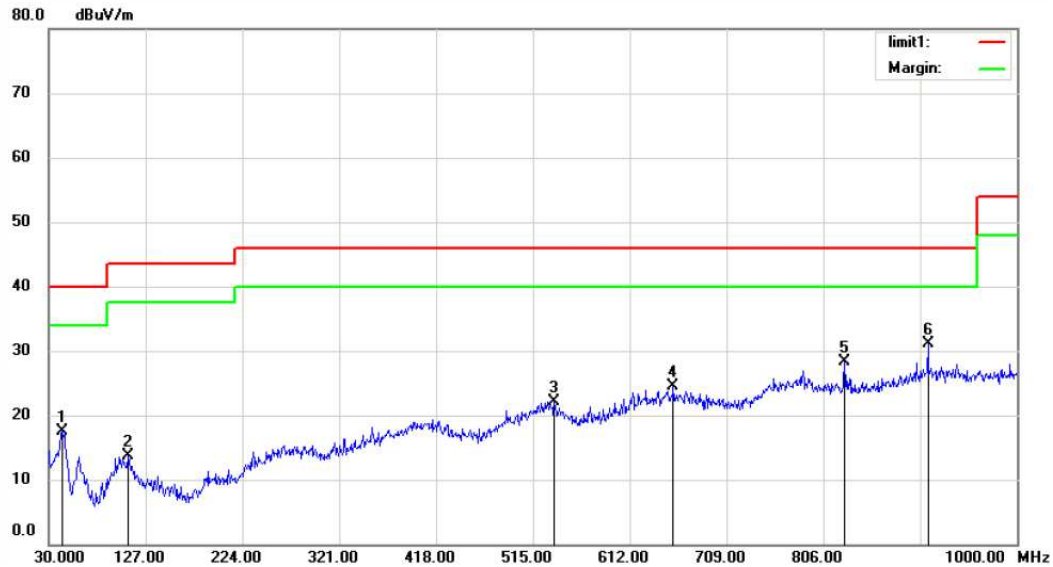
2. All measurements were made at 3 meter.

3. Negative value in the margin column shows emission below limit.

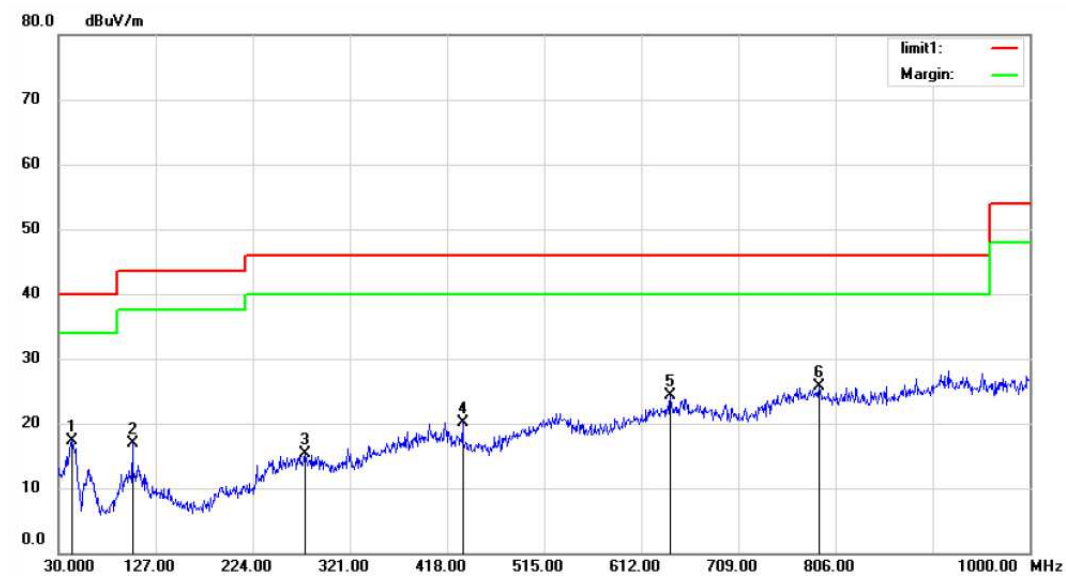
4. When tested above 1GHz, the emissions found were at least 20 dB below the limit.

4.2.7 Test Curve

Horizontal:



Vertical:



4.2.8 Measurement uncertainty

Uncertainty: 4.48 dB in the frequency range of 30-1000 MHz at a level of confidence of 95%