REPORT No. : SZ16020033S02

RF EXPOSURE EVALUATION REPORT

APPLICANT	:	F-Secure Corporation
PRODUCT NAME	:	Router
MODEL NAME	:	FSEC-SE161
TRADE NAME	:	F-Secure
BRAND NAME	:	F-Secure
FCC ID	:	2AGD5-FSECSE161
STANDARD(S)	:	47CFR 2.1091 KDB 447498 D01 General RF Exposure Guidance v06
ISSUE DATE	:	2016-11-21

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2016-11-21	First edition

TEST REPORT DECLARATION

Applicant	F-Secure Corporation
Applicant Address	Tammasaarenkatu 7, P.O. Box 24, 00181 Helsinki, Finland
Manufacturer	SHENZHEN SKYWORTH DIGITAL TECHNOLOGY CO., LTD.
Manufacturer Address	Unit A 13/F Skyworth Bldg, Gaoxin Ave.1 S.,Nanshan District,Shenzhen,China.
Product Name	Router
Model Name	FSEC-SE161
Brand Name	F-Secure
HW Version	5800-2ARF10
SW Version	1.7.2.10
Test Standards	47CFR 2.1091; KDB 447498 D01 General RF Exposure Guidance v06
Issue Date	2016-11-21
SAR Evaluation	Not Required

Tested by : Chen Sheng kui
Chen Shengkui

Reviewed by : Liu Jun
Liu Jun

Approved by : Peng Huarui
Peng Huarui

1. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

1.1. Identification of Applicant

Company Name:	F-Secure Corporation
Address:	Tammasaarenkatu 7, P.O. Box 24, 00181 Helsinki, Finland

1.2. Identification of Manufacturer

Company Name:	SHENZHEN SKYWORTH DIGITAL TECHNOLOGY CO., LTD.
Address:	Unit A 13/F Skyworth Bldg, Gaoxin Ave.1 S.,Nanshan District, Shenzhen,China.

1.3. Equipment Under Test (EUT)

Model Name:	FSEC-SE161
Trade Name:	F-Secure
Brand Name:	F-Secure
Hardware Version:	5800-2ARF10
Software Version:	1.7.2.10
Frequency Bands:	Bluetooth 4.0; WIFI 802.11a/ac/b/g/n;
Modulation Mode:	Bluetooth 4.0:GFSK; GFSK,Pi/4 DQPSK,8DPSK WIFI802.11b: DSSS;WIFI802.11g: OFDM; WIFI802.11a/ac/n: OFDM;
Antenna type:	Fixed Internal Antenna
Development Stage:	Identical prototype

1.3.1. Photographs of the EUT

1. EUT front view

2. EUT rear view

1.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	5800-2ARF10	1.7.2.10

1.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§2.1091**	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	**KDB 447498 D01v06**	General RF Exposure Guidance

2. DEVICE CATEGORY AND RF EXPOSURE LIMIT

Per user manual, this device is a Router Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

3. RF EXPOSURE EVALUATION

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Power (dBm)	Time-averaging EIRP (mW)	Power density (mW/cm²)	Limit for MPE (mW/cm²)
2.4GHz	2437	7.77	22.48 (AV power)	1059.25	0.211	1.0
5.2GHz	5220	7.37	20.98 (AV power)	683.91	0.136	
5.8GHz	5785	7.37	15.56 (AV power)	196.34	0.039	
Bluetooth 4.0+EDR	2480	2.0	-1.99 (Pk power)	1.00	0.0002	
Bluetooth 4.0 BLE	2480	2.0	-2.05 (Pk power)	0.99	0.0002	

Note:

1. MPE calculation method

$$\text{Power Density} = EIRP/4\pi R^2$$

Where: EIRP = P·G

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)

Simultaneous transmission MPE evaluation

For multiple collocated transmitters operating simultaneously in frequency bands where different limits apply

The Power Density at the specified separation distance is calculated for each transmitter. According to KDB 447498 D01, the fraction of the exposure limit is calculated for each transmitter as (Power Density of transmitter) / (Limit applicable to that transmitter) $\leq$ 1

The fractions are summed. The summed value is 0.0386 $\leq$ 1.

ANNEX GENERAL INFORMATION

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

***** END OF REPORT *****