



# RF Exposure Evaluation Report

**APPLICANT** : TomTom International BV  
**EQUIPMENT** : GPS Navigation System  
**BRAND NAME** : TomTom  
**MODEL NAME** : 4FA60  
**FCC ID** : S4L4FA60  
**FILING TYPE** : Certification  
**STANDARD** : OET Bulletin 65 Supplement C (Edition 01-01)

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with FCC OET Bulletin 65 Supplement C (Edition 01-01), and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager

**SPORTON INTERNATIONAL INC.**  
No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



## **Table of Contents**

<b>REVISION HISTORY.....</b>	<b>3</b>
<b>1. RF EXPOSURE INTRODUCTION.....</b>	<b>4</b>
<b>2. ADMINISTRATION DATA .....</b>	<b>6</b>
2.1    Testing Laboratory .....	6
2.2    Applicant .....	6
2.3    Manufacturer.....	6
<b>3. GENERAL INFORMATION .....</b>	<b>7</b>
3.1    Description of Device Under Test (DUT) .....	7
3.2    Maximum RF output power among production units.....	7
3.3    Applied Standard .....	7
<b>4. CONDUCTED RF OUTPUT POWER (UNIT: DBM).....</b>	<b>8</b>
<b>5. RF EXPOSURE EVALUATION.....</b>	<b>8</b>



## Revision History



## **1. RF Exposure Introduction**

### **Requirements**

Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile and portable and are defined as follows:

#### **▪ Fixed installation:**

Fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.

#### **▪ Mobile Devices:**

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR 2.1091.

#### **▪ Portable Devices:**

A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR 2.1093)

The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows:

**▪ Occupational/controlled Exposure:**

In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

**▪ 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.



## **2. Administration Data**

### **2.1 Testing Laboratory**

<b>Test Site</b>	SPORTON INTERNATIONAL INC.
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

### **2.2 Applicant**

<b>Company Name</b>	TomTom International BV
<b>Address</b>	Rembrandtplein 35 1017 CT Amsterdam The Netherlands

### **2.3 Manufacturer**

<b>Company Name</b>	Tech-Giant (Shanghai) Computer Co., Ltd
<b>Address</b>	C#, No. 1, South Rongteng Road, Songjiang Export Processing Zone, Shanghai, China



### **3. General Information**

#### **3.1 Description of Device Under Test (DUT)**

<b>Product Feature &amp; Specification</b>	
<b>DUT Type</b>	GPS Navigation System
<b>Brand Name</b>	TomTom
<b>Model Name</b>	4FA60
<b>FCC ID</b>	S4L4FA60
<b>Tx Frequency</b>	2402 MHz ~ 2480 MHz
<b>Antenna Type</b>	Ground chip Antenna
<b>HW Version</b>	1.0
<b>SW Version</b>	1.0
<b>Type of Modulation</b>	Bluetooth 2.1 BDR (1Mbps) : GFSK Bluetooth 2.1 EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth 2.1 EDR (3Mbps) : 8-DPSK GPS : BPSK
<b>DUT Stage</b>	Production Unit

**Remark:** The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

#### **3.2 Maximum RF output power among production units**

<b>Mode / Band</b>	<b>Bluetooth</b>		
	<b>1Mbps</b>	<b>2Mbps</b>	<b>3Mbps</b>
	<b>(GFSK)</b>	<b><math>\pi/4</math>-DQPSK</b>	<b>(8-DPSK)</b>
<b>2.4GHz Bluetooth</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### **3.3 Applied Standard**

- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v05



#### 4. Conducted RF Output Power (Unit: dBm)

##### <Bluetooth Conducted Power>

Channel	Frequency (MHz)	Average power (dBm)		
		Mode		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
CH 0	2402	-0.51	-4.16	-4.15
CH 39	2441	-2.84	-6.40	-6.39
CH 78	2480	-6.49	-10.15	-10.04

#### 5. RF Exposure Evaluation

Bluetooth Max Power (dBm)	mW	Test Distance (mm)	Frequency (GHz)	exclusion thresholds
0	1.00	5	2.48	0.31

**Note:**

1. Per KDB 447498 D01v05, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances*  $\leq$  50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for}$$

1-g SAR and  $\leq$  7.5 for 10-g extremity SAR

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

**Conclusion:** According to KDB 447498 D01v05 exclusion thresholds is  $0.31 < 3$ , RF exposure evaluation is not required.