

# RF Exposure Evaluation Report

APPLICANT : GT-tronics HK Limited  
EQUIPMENT : GT-tronics QCC Bluetooth Module  
BRAND NAME : GT-tronics  
MODEL NAME : QC386FNA, QC386FNB, QC581FNA, QC581FNB  
FCC ID : B4O-QC38XFNX  
STANDARD : 47 CFR Part 2.1091  
FCC KDB 447498 D01 v06

The product evaluation date was started from Nov. 14, 2024 and completed on Nov. 14, 2024. We, Sporton International Inc. (Shenzhen), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

**Sporton International Inc. (Shenzhen)**

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055  
People's Republic of China



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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA440902	Rev. 01	Initial issue of report.	Dec. 10, 2024



## **1. Administration Data**

### **1.1. Testing Laboratory**

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	GT-tronics HK Limited
Address	B210, Tonic Industrial Center, 19 Lam Hing Street, Kowloon Bay, Hong Kong

Manufacturer	
Company Name	GT-tronics HK Limited
Address	B210, Tonic Industrial Center, 19 Lam Hing Street, Kowloon Bay, Hong Kong

## **2. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	GT-tronics QCC Bluetooth Module
Brand Name	GT-tronics
Model Name	QC386FNA, QC386FNB, QC581FNA, QC581FNB
FCC ID	B4O-QC38XFNX
Wireless Technology and Frequency Range	Bluetooth: 2402 MHz ~ 2480 MHz
Mode	Bluetooth BR/EDR/LE
Antenna Gain	Bluetooth Ant.1 : 1.80 dBi Bluetooth Ant.2 : 2.71 dBi Bluetooth Ant.3 : 5.00 dBi
Antenna Type	Bluetooth Ant.1: Chip Antenna Bluetooth Ant.2: Metal Antenna Bluetooth Ant.3: Dipole Antenna
HW Version	v2.2
SW Version	1.0
EUT Stage	Identical Prototype

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The three kinds of Antennas are optional.

**Comments and Explanations:**

1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

## **3. Maximum RF average output tune up power among production units**

**<Bluetooth>**

Mode		Maximum Average power(dBm)
Bluetooth	BR/EDR	13.00
	LE	10.00

#### 4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



## **5. Radio Frequency Radiation Exposure Evaluation**

### **5.1. Standalone Power Density Calculation**

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Bluetooth	2402.0	5.00	13.00	18.000	63.096	0.013	1.000

**Note:**

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum RF output tune up power and the maximum antenna gain of all antennas among same frequency BT band to perform MPE calculation conservatively.

### **Conclusion:**

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----