



**Spectrum Research &  
Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong  
Rd.,Ling 8, Shan-Tong Li,  
Chung-Li Dist., Taoyuan City  
320, Taiwan (R.O.C.)

## TEST REPORT

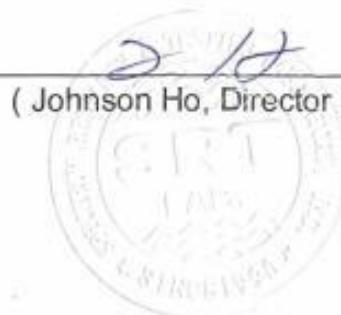
Reference No.: A16040801  
Report No.: MPE16040801  
FCC ID : 2AA83-TP001  
Page:1 of 8  
Date: Jun. 03, 2016

Product Name: BLE TPMS  
Model No.: TP001  
Applicant: Ichia Technologies, Inc.  
268, HwaYa 2nd Road, Hwa-Ya Tech. Park, Gueishan,  
Taoyuan, Taiwan, R.O.C  
Date of Receipt: Apr. 08, 2016  
Finished date of Test: May. 26, 2016  
Applicable Standards: 47 CFR Part 1  
KDB 447498  
FCC OET Bulletin 65

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Boris Lin, Date: 06/03/2016  
(Boris Lin)

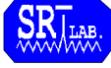
Approved By : J. H., Date: 6/3/2016  
( Johnson Ho, Director )



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## Table of Contents

1.	DOCUMENT POLICY AND TEST STATEMENT .....	3
1.1	DOCUMENT POLICY .....	3
1.2	TEST STATEMENT .....	3
1.3	EUT MODIFICATION .....	3
2.	DESCRIPTION OF EUT AND TEST MODE .....	4
2.1	GENERAL DESCRIPTION OF EUT .....	4
3.	RF POWER EXPOSURE EVALUATION TEST .....	5
3.1	LIMIT .....	5
3.2	TEST PROCEDURE .....	6
3.3	EUT OPERATING CONDITION .....	7
3.4	CONNECT POWER AT THE ANTENNA CONNECTOR RESULT .....	8

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## **1. DOCUMENT POLICY AND TEST STATEMENT**

### **1.1 DOCUMENT POLICY**

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

### **1.2 TEST STATEMENT**

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source from battery : DC power source 3V, was used during the test.

### **1.3 EUT MODIFICATION**

- No modification in SRT Lab.

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## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	BLE TPMS
<b>MODEL NO.</b>	TP001
<b>POWER SUPPLY</b>	DC power source battery : DC 3.0V
<b>FREQUENCY BAND</b>	2.4 GHz (Bluetooth V4.0 Low Energy, no BR/EDR )
<b>CARRIER FREQUENCY</b>	2.402 GHz ~ 2.480 GHz
<b>NUMBER OF CHANNEL</b>	40
<b>Rated RF Output power</b>	-10.33 dBm
<b>Modulation type</b>	GFSK
<b>Mode of operation</b>	Duplex
<b>antenna type</b>	Chip Antenna
<b>Antenna gain</b>	0.50 dBi
<b>Operating Temperature Range</b>	-20 ~ 50°C

**NOTE:** For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

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### 3. RF POWER EXPOSURE EVALUATION TEST

#### 3.1 LIMIT

According to the requirements of Part 1.1310(e), KDB 447498 D01 General RF Exposure Guidance v05r02, Section7, and FCC OET Bulletin 65.

#### Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength(E) (V/m)	Magnetic Field Strength(H) (A/m)	Power density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
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

#### Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength(E) (V/m)	Magnetic Field Strength(H) (A/m)	Power density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
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

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

**NOTE 1:** General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

**NOTE 2:** Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

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### 3.2 TEST PROCEDURE

1. The EUT was operating in Tx mode.
2. The EUT uses an external antenna, the antenna gain of 2 dBi is declared by the manufacturer.
3. As discussed in OET Bulletin 65, calculations can be made to predict RF field strength and power density levels around typical RF sources. For example, in the case of a non-directional antenna, a prediction for power density in the far-field of the antenna can be made by use of the general Equations (1) or (2) below [for conversion to electric or magnetic field strength see Equation (3) above]. These equations are generally accurate in the far-field of an antenna but will over-predict power density in the near field, where it could be used for making a "worst case" or conservative prediction.

$$S=PG/4\pi R^2 \quad (\text{Eq. 1})$$

$$S=\text{connect power}/4\pi R^2 \quad (\text{Eq. 2})$$

$$S=E^2/3770=37.7H^2 \quad (\text{Eq. 3})$$

where:  $S$  = power density ( $\text{mW/cm}^2$ )

$E$  = electric field strength ( $\text{V/m}$ )

$H$  = magnetic field strength ( $\text{A/m}$ )

$S$  = power density (in appropriate units, e.g.  $\text{mW/cm}^2$ )

$P$  = power input to the antenna (in appropriate units, e.g.,  $\text{mW}$ )

$G$  = power gain of the antenna in the direction of interest relative to an isotropic radiator (dBi)

$R$  = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

where: connect power = equivalent (or effective) isotropically radiated power.

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### **3.3 EUT OPERATING CONDITION**

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. Set the EUT under continuous transmission condition mode.
4. The EUT was set to the highest available power level.

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### 3.4 CONNECT POWER WITH DIRECT CONNECTION RESULT

Temperature:	24 °C	Humidity:	62% RH
Spectrum Detector:	PK.	Tested Mode:	Tx
Tested By:	Boris Lin	Modulation Type:	GFSK
Tested Date:	May. 26, 2016		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	MPE DISTANCE (cm)	ANTENNA GAIN (dBi)	PEAK POWER OUTPUT		CALCULATED RF EXPOSURE (mW/cm²)	LIMIT (mW/cm²)
				dBm	mW		
00	2402	0.5	0.50	-10.33	0.0927	0.015	1

NOTE: Limits for General Population/Uncontrolled Exposure

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	MPE DISTANCE (cm)	ANTENNA GAIN (dBi)	PEAK POWER OUTPUT		CALCULATED RF EXPOSURE (mW/cm²)	LIMIT (mW/cm²)
				dBm	mW		
00	2402	0.25	0.50	-10.33	0.0927	0.059	5

NOTE: Limits for Occupational/Controlled Exposure