



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.: A16051805
Report No.: MPE16051805
FCC ID : 2IUHTP001
Page:1 of 7
Date: Jul. 31, 2017

Product Name: BLE TPMS
Model No.: TP001
Applicant: HUNG SHEN TECHNOLOGY CO., LTD.
No.11, Kailong St., Bade Dist.,
Taoyuan City 334, Taiwan (R.O.C.)
Date of Receipt: May. 18, 2016
Finished date of Test: Jul. 31, 2017
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: 07/31/2017
(Boris Lin)

Approved By : Johnson Ho , Date: 7/31/2017
(Johnson Ho, Director)





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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

PRODUCT	BLE TPMS
MODEL NO.	TP001
POWER SUPPLY	DC power source battery : DC 3.0V
FREQUENCY BAND	2.4 GHz (Bluetooth V4.0 Low Energy, no BR/EDR)
CARRIER FREQUENCY	2.402 GHz ~ 2.480 GHz
NUMBER OF CHANNEL	40
Rated RF Output power	-10.33 dBm
Modulation type	GFSK
Mode of operation	Duplex
antenna type	Chip Antenna
Antenna gain	0.50 dBi
Operating Temperature Range	-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 v06, 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 ²)	Averaging Time E ² , H ² or S (minutes)
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

NOTE : 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.

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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.

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

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

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

where: S = power density (mW/cm²)

E = electric field strength (V/m)

H = magnetic field strength (A/m)

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., 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.

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:	Jul. 13, 2017		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	MPE DISTANCE (cm)	ANTENNA GAIN (dBi)	PEAK POWER OUTPUT		CALCULATED RF EXPOSURE (mW/cm ²)	LIMIT (mW/cm ²)
				dBm	mW		
00	2402	20	0.50	-10.33	0.0927	9.2210X10 ⁻⁶	1

NOTE: Limits for General Population/Uncontrolled Exposure