



## MPE Test Report

**Report No.:** LGD-ESH-P20080757B-3

**FCC ID:** Q4B-P4

**Product:** BLE and 6LoWPAN Wireless module

**Test Model:** IPPAN4-LROT

**Received Date:** Aug.10, 2020

**Test Date:** Aug.10 to Sep.09, 2020

**Issued Date:** Sep.09, 2020

**Applicant:** The Watt Stopper, Inc.

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**Manufacturer:** Shanghai Legrand Electrical Co., Ltd

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**Issued By:** BUREAU VERITAS ADT (Shanghai) Corporation

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### Release Control Record

Issue No.	Description	Date Issued
LGD-ESH-P20080757B-3	Original release	Sep.09, 2020



# 1 Certificate of Conformity

**Product:** BLE and 6LoWPAN Wireless module

**Brand:** 

**Test Model:** IPPAN4-LROT

**Applicant:** The Watt Stopper, Inc.


**Test Date:** Aug.10 to Sep.09, 2020

**Standards:** FCC Part 2 (Section 2.1091)  
KDB 447498 D01 General RF Exposure Guidance v06  
IEEE C95.1-1992

The above equipment has been tested by **BUREAU VERITAS ADT (Shanghai) Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

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**Approved by :** Daniel SUN , **Date:** Sep.09, 2020  
Daniel SUN  
EMC Lab Manager



## 2 General Information


### 2.1 General Description of EUT

802.15.4

Product	BLE and 6LoWPAN Wireless module
Brand	
Test Model	IPPAN4-LROT
Power Rating	2.0-3.3Vdc
Modulation Type	O-QPSK
Modulation Technology	DSSS
Operating Frequency	2405MHz to 2480MHz
Number of Channel	16
Antenna Type	Ant1: Ceramic Ant2: Dipole
Antenna Connector	--
Antenna Gain	Ant1:0.5dBi Ant2:4dBi
Product SW/HW version	V1.0/ IPPAN4-LROT
Radio SW/HW version	V1.0/NA
Test SW version	V17.0.2
RF power setting in Test SW	-4dBm for CH11~CH25, -8dBm for CH26

Note: For more details, please refer to the User's manual of the EUT.

## BLE

Product	BLE and 6LoWPAN Wireless module
Brand	
Test Model	IPPAN4-LROT
Power Rating	2.0-3.3Vdc
Modulation Type	GFSK
Modulation Technology	Bluetooth Low Energy 5.0
Operating Frequency	2402MHz ~ 2480MHz
Number of Channel	40
Antenna Type	Ant1: Ceramic Ant2: Dipole
Antenna Connector	--
Antenna Gain	Ant1: 0.5dBi Ant2: 4dBi
Product SW/HW version	V1.0/ IPPAN4-LROT
Radio SW/HW version	V1.0/NA
Test SW version	V17.0.2
RF power setting in Test SW	+4dBm

Note: For more details, please refer to the User's manual of the EUT.



### 3 RF Exposure

#### 3.1 Limits For Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1,500	-	-	F/1500	30
1,500-100,000	-	-	1.0	30

F = Frequency in MHz

#### 3.2 MPE Calculation Formula

Power density (S) is calculated according to the formula:

$$S = PG / (4\pi R^2)$$

Where S = power density in mW/cm<sup>2</sup>

P = transmit power in mW

G = numeric gain of transmit antenna (numeric gain=Log-1(dB antenna gain/10))

R = distance (cm)

#### 3.3 MPE Calculation Formula

The antenna of this product, under normal use condition, is at least 20cm from the body of the user. So the device is classified as Mobile Device.

### 3.4 Calculation Result of Maximum Permissible Exposure

802.15.4:

Frequency Band (MHz)	Max. Conducted output power(dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402-2480	15.51	4.0	20	0.017771748	1

BLE

Frequency Band (MHz)	Max. Conducted output power(dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402-2480	2.15	4.0	20	0.000819842	1

#### Conclusion:

The calculation result of MPE is less than the limit.

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