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.
Address:	2700 Zanker Road Suite 168 San Jose, CA 95134
Manufacturer:	Shanghai Legrand Electrical Co., Ltd
Address:	1/F, Building 1, No. 1358 Xiangyang Road, Minhang District, Shanghai, China
Issued By:	BUREAU VERITAS ADT (Shanghai) Corporation
Lab Address:	No. 829, Xinzhuan Road, Shanghai, P.R.China (201612)

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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: legrand

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.

Prepared by : Yuan Zhang , **Date:** Sep.09, 2020

Yuan ZHANG

Project Engineer

Approved by : , **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	legrand
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	legrand
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^2)	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^2

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^2)	Limit (mW/cm^2)
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^2)	Limit (mW/cm^2)
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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