

REM-EMIESS23E443DAV-03Av0

MPE test report

According to the standard:
CFR 47 FCC PART 15

Equipment under test:
DAVEY TRONIC 5 BLASTHUB

FCC ID: **2AUQC-DT5GBH**

Company:
DAVEY BICKFORD

Distribution: Mrs STOJANOVIC

(Company: DAVEY BICKFORD)

Number of pages: 7

Ed.	Date	Modified Page(s)	Technical Verification and Quality Approval	
			Name and Function	Visa
0	16-Jul-24	Creation	M. DUMESNIL, Radio Laboratory Manager	

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DESIGNATION OF PRODUCT: *DAVEY TRONIC 5 BLASTHUB*

Serial number (S/N): 9235

Reference / model (P/N): *BH*

Firmware version: *0x17 (LoRa Module)*

MANUFACTURER: *DAVEY BICKFORD*

COMPANY SUBMITTING THE PRODUCT:

Company: DAVEY BICKFORD

Address: LE MOULIN GASPARD
CHEMIN DE LA PYROTECHNIE
89550 HERY
FRANCE

Responsible: Mrs STOJANOVIC

DATES OF TEST: From 25-Sep-23 to 17-Oct-23 and 18-Apr-24

TESTING LOCATION: EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE
FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677

TESTED BY: B. VOVARD

VISA:

WRITTEN BY: B. VOVARD

A handwritten signature in black ink, appearing to read "B. Vovard", with a horizontal line extending to the right.

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	26-Apr-24	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **DAVEY TRONIC 5 BLASTHUB**, in accordance with normative reference.

The equipment under test integrates:

- 2x LoRa 2.4 GHz transceiver radio module not already certified,
- WiFi 5 GHz transceiver radio module already certified (FCC ID: T7V-9026 / IC: 216Q-9026),
- 13.56MHz RFID Tag,
- GNSS module operational in the band 1559MHz – 1610MHz

2. PRODUCT DESCRIPTION

Class: A

Utilization: Industrial

LoRa 2.4 GHz :

Antenna type and gain: Integrated antenna
Gain at 2414.8 MHz for LoRa 2A=> +10.15 dBi
Gain at 2436.4 MHz for LoRa 2A => +10.83 dBi
Gain at 2473.2 MHz for LoRa 2A => +9.58 dBi
Gain at 2414.8 MHz for LoRa 2B => +9.43 dBi
Gain at 2436.4 MHz for LoRa 2B => +9.76 dBi
Gain at 2473.2 MHz for LoRa 2B => +9.88 dBi

Operating frequency band: From 2400 MHz to 2483.5 MHz

Operating frequency range: From 2414.8 MHz to 2473.2 MHz

Number of channels: 17

Frequencies tested: 2414.8 MHz, 2436.4 MHz and 2473.2 MHz

Channel spacing: 0.8 to 8 MHz

Modulation: LoRa

Power soft adjusted to 13 (LoRa 2A & LoRa 2B)

WiFi 5 GHz :

Antenna type and gain:	Integrated antenna with maximal gain of 1.5 dBi
Operating frequency range:	UNII-1: From 5150 MHz to 5250 MHz
Number of channels:	UNII-1: 1 channel
Channel spacing:	20MHz
Mode tested:	802.11 a
Modulation:	OFDM
Power source:	Internal rechargeable Li-Ion battery 7.27 Vdc 7000mAh Input used for measurements by adapter 12 Vdc on 120 Vac 60 Hz

The radio is operational during charge mode.

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below.
They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 (2023)	Radio Frequency Devices
ANSI C63.10	2013 Procedures for Compliance Testing of Unlicensed Wireless Devices.
447498 D04 Interim General RF Exposure Guidance v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices

4. RF EXPOSURE**LoRa 2A Radio Part in standalone:**

In accordance with KDB 447498 D04 Interim General RF Exposure Guidance v01, paragraph 1.4.2 :

Maximum Permissive Exemption according paragraph 1.1310(d)(2) of CFR 47 FCC Part

Maximum measured power = 111.5 dBμV/m = 0.042376 W at 2473.2 MHz

with $P = (E \times d)^2 / (30 \times G_p)$ with $d = 3$ m and $G_p = 1$

$$PSD = EIRP / (4 \times \pi \times R^2)$$

$$\Rightarrow 42.376 / (4 \times \pi \times (20 \text{ cm})^2) = 0.00843 \text{ mW/cm}^2 \text{ (limit = 1 mW/cm}^2\text{)}$$

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.

LoRa 2B Radio Part in standalone:

In accordance with KDB 447498 D04 Interim General RF Exposure Guidance v01, paragraph 1.4.2 :

Maximum Permissive Exemption according paragraph 1.1310(d)(2) of CFR 47 FCC Part

Maximum measured power = 111.3 dBμV/m = 0.040468 W at 2414.8 MHz

with $P = (E \times d)^2 / (30 \times G_p)$ with $d = 3$ m and $G_p = 1$

$$PSD = EIRP / (4 \times \pi \times R^2)$$

$$\Rightarrow 40.468 / (4 \times \pi \times (20 \text{ cm})^2) = 0.00805 \text{ mW/cm}^2 \text{ (limit = 1 mW/cm}^2\text{)}$$

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.

WiFi 5 GHz Radio Part in standalone:

In accordance with KDB 447498 D04 Interim General RF Exposure Guidance v01, paragraph 1.4.2 :

Maximum Permissive Exemption according paragraph 1.1310(d)(2) of CFR 47 FCC Part

According Grant, maximum measured power = 0.031 W at 5180 MHz
with $P = (E \times d)^2 / (30 \times G_p)$ with $d = 3$ m and $G_p = 1$

$$PSD = EIRP / (4 \times \pi \times R^2)$$

$$\Rightarrow 31 / (4 \times \pi \times (20 \text{ cm})^2) = 0.00616 \text{ mW/cm}^2 \text{ (limit = 1 mW/cm}^2\text{)}$$

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.

Calculus for simultaneous transmission

$$\sum \text{ of MPE ratio} = \text{MPE ratio(LoRa 2A)} + \text{MPE ratio(WiFi 5GHz)}$$

$$\sum \text{ of MPE ratio} = 0.00843 + 0.00616 = 0.01459 \leq 1.0$$

The product meet the requirement for Simultaneous transmission with both SAR-Based and MPE-Based Test exemptions from §2.2.2 of KDB 447498 D04 Interim General RF Exposure Guidance v01

□□□ End of report □□□