

Test Report

Prepared for: Preferred Security Components Inc. of PA DBA Cartell

Model: CW-HUB

Project No: p2640011

Serial Number: 260101-00808

FCC ID: 2AUXCCWHUB

To

FCC Part 1.1310

FCC Part 1.1307

447498 D04 Interim General RF Exposure Guidance v01

Date of Issue: May 28, 2026

On behalf of the applicant:

Preferred Security Components Inc. of PA DBA Cartell
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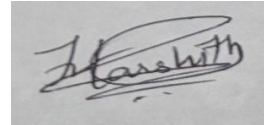
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Reviewed / Authorized By:



Harshith Devaraja
EMC Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	May 28, 2026	Harshith Devaraja	Original Document

Current revision of the test report replaces any prior versions. Only the current version of the test report is valid.

EUT Description

Model:	CW-HUB
Serial:	260101-00808
Firmware:	1032/5019
Description:	Works with Cartell's wired and wireless device to enable notifications to the Cartell app.
Additional Information:	1. EUT can simultaneously transmit BLE and LoRa DTS 2. EUT can simultaneously transmit Wi-Fi 802.11b/g/n and LoRa DTS BLE Radio Frequency Range and Operational Info: 2402 – 2480 MHz BLE GFSK (1 Mbps) BLE GFSK (2 Mbps) LoRa Radio Frequency Range and Operational Info: 903 – 927 MHz LoRa DTS – CSS Modulation (Spread factor 12) Wi-Fi 802.11 Radio Frequency Range and Operational Info: 2412 – 2462 MHz 802.11b: DSSS 802.11g: OFDM 802.11n: OFDM Usage: Fixed/Mobile
Receipt of Sample(s):	May 8, 2026
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

Maximum Conducted Output Power and Antenna Gain Table

Worst case data collected from the following reports in each band.

1. p2640011 BLE_FCC_247_RSS_247_Rev 1.0
2. p2640011 WiFi_FCC_247_RSS_247_Rev 1.0
3. p2640011 LoRa_FCC_247_RSS_247_Rev 1.0

Band		Maximum Conducted Output Power (dBm)	Maximum Conducted Output Power (mW)	Antenna gain (dBi)
BLE (1 Mbps)	2440 MHz	7.35	5.4	3.96
802.11b (1 Mbps)	2437 MHz	18.69	74	3.96
LoRa (SF12)	915 MHz	19.47	88.5	2

MPE Evaluation

This is a fixed/mobile device used in Uncontrolled Exposure environment.

Limits Controlled Exposure 47 CFR 1.1310 Table 1, (A)

0.3-3.0 MHz:	Limit [mW/cm ²] = 100
3.0-30 MHz:	Limit [mW/cm ²] = (900/f ²)
30-300 MHz:	Limit [mW/cm ²] = 1.0
300-1500 MHz:	Limit [mW/cm ²] = f/300
1500-100,000 MHz	Limit [mW/cm ²] = 5

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
30-300 MHz:	Limit [mW/cm ²] = 0.2
300-1500 MHz:	Limit [mW/cm ²] = f/1500
1500-100,000 MHz	Limit [mW/cm ²] = 1.0

Test Data

BLE 1 Mbps

Test Frequency, MHz	2440
Conducted peak Power, mW (P)	5.4
Antenna Gain Isotropic	3.96 dBi
Antenna Gain Numeric (G)	2.49
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mW/cm ²

Power Density (S) = 0.00267 mW/cm ²
Limit = (from above table) = 1.0 mW/cm ²

Wi-Fi 802.11b 1 Mbps

Test Frequency, MHz	2437
Conducted peak Power, mW (P)	74
Antenna Gain Isotropic	3.96 dBi
Antenna Gain Numeric (G)	2.49
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mW/cm ²

Power Density (S) = 0.03665 mW/cm ²
Limit = (from above table) = 1.0 mW/cm ²

LoRa DTS (CSS SF12)

Test Frequency, MHz	915
Conducted peak Power, mW (P)	88.5
Antenna Gain Isotropic	2 dBi
Antenna Gain Numeric (G)	1.58
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mW/cm ²

Power Density (S) = 0.0278 mW/cm ²
Limit = (from above table) = 0.610 mW/cm ²

Band		Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
BLE (1 Mbps)	2440 MHz	0.00267	1	Pass
802.11b (1 Mbps)	2437 MHz	0.03665	1	Pass
LoRa (SF12)	915 MHz	0.0278	0.610	Pass

Simultaneous Transmission SAR Test Exemption with Respect to Multiple Exemption Criteria

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (*Evaluated_k* term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from § 1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1 \quad (C.1)$$

- a* number of fixed, mobile, or portable RF sources claiming exemption using the § 1.1307(b)(3)(i)(B) formula for *P_{th}*, including existing exempt transmitters and those being added.
- b* number of fixed, mobile, or portable RF sources claiming exemption using the applicable § 1.1307(b)(3)(i)(C) Table 1 formula for Threshold ERP, including existing exempt transmitters and those being added.
- c* number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance.
- P_i* the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).
- P_{th,i}* the exemption threshold power (*P_{th}*) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source *i*.
- ERP_j* the available maximum time-averaged power or the ERP, whichever is greater, of fixed, mobile, or portable RF source *j*.
- ERP_{th,j}* exemption threshold ERP for fixed, mobile, or portable RF source *j*, at a distance of at least $\lambda/2\pi$, according to the applicable § 1.1307(b)(3)(i)(C) Table 1 formula at the location in question.
- Evaluated_k* the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation.
- Exposure Limit_k* either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable sources, as applicable

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE shall be less than 1, to determine simultaneous transmission exposure compliance.

BLE and LoRa Simultaneous Transmission

$$\left(\frac{0.00267}{1}\right) + \left(\frac{0.0278}{0.610}\right) < 1$$

$$0.0482 < 1$$

Wi-Fi and LoRa Simultaneous Transmission

$$\left(\frac{0.03665}{1}\right) + \left(\frac{0.0278}{0.610}\right) < 1$$

$$0.0822 < 1$$

EUT is MPE-based simultaneous transmission exposure compliant.

END OF TEST REPORT