



Radio Frequency Exposure Evaluation Report

For:
Visteon Corporation

Brand:
Visteon

Marketing Name:
Battery Pack Control Module

Model Name:
BPCMFx

Product Description:
Battery Pack Control Module

FCC ID: NT8-BPCMFx
IC: 3043A-BPCMFx

Applied Rules and Standards:
CFR Part Part1 (1.1307 & 1.1310), Part 2 (2.1091),
FCC KDB 447498 D04 Interim General RF Exposure Guidance v01
ISED RSS-102 Issue 6

REPORT #: EMC_VISTE_002_23001_FCC_ISED_RF_Exposure_BPCMFx

DATE: 2024-06-10



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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091) and IC standard RSS-102 Issue 6 under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant). In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC and IC rule parts based on available specifications for worst case conditions at 20 cm distance to the body.

Company	Description	Model #
Visteon Corporation	Battery Pack Control Module	BPCMFX

Responsible for the Report:

2024-06-10	Compliance	Guangcheng Huang (Senior EMC Test Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.
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2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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EMC Lab Manager:	Ghanma, Issa
Project Manager:	Baskaran, Akanksha

2.2 Identification of the Client

Client's Name:	Visteon Corporation
Street Address:	One Village Center Drive
City/Zip Code	Van Buren Township, MI/48111
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	Same as Client
City/Zip Code	Same as Client
Country	Same as Client

3 Equipment Under Test (EUT)

3.1 EUT Specifications

Model No:	BPCMFX
Marketing Name:	Battery Pack Control Module
HW Version :	VPRE1F-12A650-MA
SW Version :	SWE201-28418-000F01
FCC ID :	NT8-BPCMFX
IC :	3043A-BPCMFX
FWIN:	N/A
HVIN:	BPCMFX
PMN:	Battery Pack Control Module
Product Description:	Battery Pack Control Module
Power Supply / Rated operating Voltage Range:	Min. 8 V, Nom 13.5 V, Max. 16 V powered by the vehicle battery power system
Operating Temperature Range	-40°C to +85°C
Sample Revision	Production
EUT Dimensions	12.4 cm X 40.86 cm X 0+ 3.47 cm
Note: All information provided by the client.	

3.2 Radio Specifications

Embedded Radio Technologies	Integrating 2 ADI Proprietary Protocol: 1.- ADRF8951 chipset 2.- ADRF8951 chipset
Frequency Range / number of channels:	1.- ADRF8951 chipset: Low Power 2.4 GHz wBMS radio Frequency Range: 2405 - 2480 MHz Channels: 0-15 2.- ADRF8951 chipset: Low Power 2.4 GHz wBMS radio Frequency Range: 2405 - 2480 MHz Channels: 0-15
Rated max. EIRP	1.- ADRF8951 chipset: 12 dBm 2.- ADRF8951 chipset: 12 dBm
Tested radio technology	Integrating 2 ADI Proprietary Protocol
Antenna Type / Gain	1. Part No. 1001013 Product: 2.4 GHz FR4 Antenna 2. Part No. 1001013 Product: 2.4 GHz FR4 Antenna
Modes of Operation	1.- ADRF8951 chipset: Proprietary Protocol: 802.15.4 2400 MHz - 2483.5 MHz ISM Band Modulation: GFSK Nominal Channel Bandwidth: 5 MHz Duty Cycle: 27% 2.- ADRF8951 chipset: Proprietary Protocol: 802.15.4 2400 MHz - 2483.5 MHz ISM Band Modulation: GFSK Nominal Channel Bandwidth: 5 MHz Duty Cycle: 27%
Note: All information provided by the client.	

4 RF Exposure Limits and FCC and IC Basic Rules

4.1 FCC 2.1091

4.1.1 § 2.1091(c)(1)

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for mobile devices with single RF sources having either more than an available maximum time-averaged power of 1 mW or more than the ERP listed in Table 1 to § 1.1307(b)(3)(i)(C), whichever is greater. For mobile devices not exempt by § 1.1307(b)(3)(i)(C) at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 of this chapter is necessary if the ERP of the device is greater than ERP_{20cm} in the formula below. If the ERP of a single RF source at distances from 20 centimeters to 40 centimeters and frequencies from 0.3 GHz to 6 GHz is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP) in comparison with the following formula only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

$$P_{th}(\text{mW}) = ERP_{20\text{ cm}}(\text{mW}) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

4.1.2 § 2.1091(c)(2)

For multiple mobile or portable RF sources within a device operating in the same time averaging period, routine environmental evaluation is required if the formula in § 1.1307(b)(3)(ii)(B) of this chapter is applied to determine the exemption ratio and the result is greater than 1.

4.1.3 § 1.1307(b)(3)(ii)(B)

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

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

4.2 Field reference level (FRL) exposure exemption limits according to RSS-102 Issue 6, section 6.6

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

5 Evaluations

5.1 FCC RF Exposure

Radio	Freq-Low [GHz]	Power [dBm]	Power [W]	AG [dBi]	AG [lin]	EIRP [W]	ERP [W]	Threshold ERP [W]	ERP < Threshold ERP [W]
Proprietary	2.405	10.6	0.0115	2.60	1.82	0.021	0.013	0.77	Yes

Conclusion:

RF exposure exemption applicable.

5.2 ISED RF Exposure

Radio	Freq-Low [GHz]	Power [dBm]	Power [W]	AG [dBi]	AG [lin]	EIRP [W]	Exemption EIRP limit [W]	Exemption
Proprietary	2.405	10.6	0.0115	2.60	1.82	0.021	2.68	Yes

Conclusion:

RF exposure exemption applicable.

6 Revision History

Date	Report Name	Changes to report	Prepared by
2024-06-03	VISTE_002_23001_FCC_ISED_RF_Exposure_BPCMFX	Initial version	Guangcheng Huang
2024-06-10	VISTE_002_23001_FCC_ISED_RF_Exposure_BPCMFX_Rev1	Update standard issue #	Guangcheng Huang

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