

Test report No:
3492ERM.025

Assessment report

RF EXPOSURE REPORT ACCORDING TO FCC 47 CFR Part 2.1091; FCC 47 CFR Part 1.1307 FCC 47 CFR Part 1.1310

(*) Identification of item under evaluation	Motorcycle cockpit domain controller, called Infotainment Front Control Unit (IFCU) of 12.3 inch
(*) Trademark	Visteon
(*) Model and /or type reference	HARLEYIFCU
(*) Other identification of the product	FCC ID : NT8- HARLEYIFCU HW Version : 1.E / 1.F / 1.G SW Version : v1315 FVIN : 1.0 HVIN : 1.E / 1.F / 1.G
(*) Features	Audio, Bluetooth (Dual HFP), Wi-Fi (Access Point / Master 5GHz - STA / Slave mode 2.4GHz & 5GHz), A2B (RF Link), GNSS, Display (Capacitive, 12.7") 1.E Variant: AM/FM HD, Tuner and water band 1.G Variant: AM/FM, Tuner 1.F: AM/FM, DAB Tuner and Radio
(*) Manufacturer	Visteon Corporation One Village Center Drive, Van Buren Township, MI 48111, USA
Test method requested, standard	FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices. FCC 47 CFR Part 1.1307: Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR Part 1.1310: Radiofrequency radiation exposure limits.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC & RF Lab Manager
Date of issue	03-22-2023
Report template No	FERMUSA_200 (* "Data provided by the client")

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Competences and guarantees

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Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item under evaluation", "Trademark", "Model and/or type reference", "General description of the device", "Other identification of the product").
2. Maximum antenna gain and use distance information.
3. The device under evaluation consists of a Instrument cluster functionality with Speedometer, Tachometer, Battery, Fuel Main Gages plus common warning lights. Infotainment functionality as included HD Radio NA, DAB Radio EU, or FM/AM Radio RoW, plus connectivity (USB, Bluetooth and Wi-Fi connections for Cellphone and Helmets).
4. Applicant's declaration letter shown below for model similarity

Visteon

Name
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Corporate Secretary

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Date: March 20, 2023

To: Regulatory Certification Body DEKRA Testing and Certification, S.A.U. Parque Tecnológico de Andalucía C/ Severo Ochoa 2 & 6, 29590,Málaga, España	From: Visteon Corporation One Village Center Drive, Van Buren Township, MI, USA. Postcode/Zip Code: 48111
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Ref: EU-TEC/FCC/ISED update related to product:

Type of equipment:	Infotainment Control Unit
Brand name:	Visteon
Model name:	HARLEYIFCU

To whom it may concern,

Model name:	HARLEYIFCU	CHANGES
HW version:	1.E	Audio Hub, Audio Processing, HD digital radio and weather band
HW version:	1.F	Audio Hub, Audio Processing, DAB digital radio and Radion
HW version:	1.G	Audio Hub and Audio Processing
SW version:	v1315	Same for 3 HW versions

*Same PCB, different Tunner Specs, weather band only populated on 1.E variant and Radion only populated on 1.F variant.

*Same electrical and mechanical features.

*Same PCB board is used on the 3 Hardware versions. However, only the 1.F Hardware has the DAB digital radio populated and therefore is being considered as the most complex hardware for RED certification. 1.E hardware has HD radio and water band, which make if the most complex one for FCC.

*For RED certification, partial tests have been performed over 1.E and 1.G hardware to corroborate the behaviour is the same as on 1.F hardware, test report results for 1.F product version are valid and representative for the rest of hardware versions 1.E and 1.G and partial test reports were performer for each variant depending on the product features.

*For FCC/ISED certification, partial tests have been performed over 1.F and 1.G hardware to corroborate the behaviour is the same as on 1.E hardware, test report results for 1.E product version are valid and representative for the rest of hardware versions 1.F and 1.G and partial test reports were performer for each variant depending on the product features.

*According to the geolocation of the product, the features available will be automatically activates or deactivated.

Sincerely,

By:	Heidi Sepanik	
Title:	Corporate Secretary	
Company:	Visteon Corporation	
Telephone:	734.710.4672	
e-mail:	hdiabol@visteon.com	
		Signature



DEKRA Certification Inc. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Identification of the client

Visteon Corporation

One Village Center Drive, Van Buren Township, MI 48111, USA

Document history

Report number	Date	Description
3492ERM.025	03-22-2023	First release

Appendix A: FCC RF Exposure assessment result

General description of the device under evaluation

The device under evaluation consists of a Instrument cluster functionality with Speedometer, Tachometer, Battery, Fuel Main Gages plus common warning lights. Infotainment functionality as included HD Radio NA, DAB Radio EU, or FM/AM Radio RoW, plus connectivity (USB, Bluetooth and Wi-Fi connections for Cellphone and Helmets).

According to the manufacturer, during its normal use, the separation distance between the radiating structures of the device and nearby users will be greater than 40 cm respect to the extremities and greater than 90 cm respect to the body or head. In order to perform a conservative evaluation, a distance of 40 cm for extremities has been used.

As stated into DEKRA Testing and Certification, Inc. test report num. 3492ERM.023 and 3492ERM.024, the maximum measured output power levels for each supported technology are:

Technology / Mode	Operating Band	Frequency under evaluation (MHz)	Maximum Conducted Output Power (dBm)	Antenna peak gain (dBi)	Maximum E.R.P. (dBm)	Maximum E.R.P. (mW)	Maximum E.I.R.P. (dBm)	Maximum E.I.R.P. (mW)
802.11b/g/n/ax	2.4 GHz	2412 - 2484	17.00	1.50	16.35	43.15	18.50	70.79
802.11a/n/ac/ax	U-NII-1	5150 - 5250	16.60	3.50	17.95	62.37	20.10	102.33
802.11a/n/ac/ax	U-NII-2A	5260 - 5320	17.50	3.50	18.85	76.74	21.00	125.89
802.11a/n/ac/ax	U-NII-2C	5500 - 5700	11.80	3.50	13.15	20.65	15.30	33.88
802.11a/n/ac/ax	U-NII-3	5725 - 5850	7.50	3.50	8.85	7.67	11.00	12.59
BT BR/EDR Chip 1	2.4 GHz	2400 - 2483.5	6.00	1.50	5.35	3.43	7.50	5.62
BT BR/EDR Chip 2	2.4 GHz	2400 - 2483.5	3.30	1.50	2.65	1.84	4.80	3.02

Table 1: Equipment specifications

Evaluation Results

The evaluation according to the minimum intended use distance of 40 cm will be as follow:

Technology / Mode	Operating Band	Frequency under evaluation (MHz)	Distance (cm)	Maximum E.R.P. (mW)	§1.1307(b)(3).i.(C) Exposure Limit (mW)	Verdict for exemption § 1.1307(b)(3).i
802.11b/g/n/ax	2.4 GHz	2412 - 2484	40.00	43.15	3072.00	Pass
802.11a/n/ac/ax	U-NII-1	5150 - 5250	40.00	62.37	3072.00	Pass
802.11a/n/ac/ax	U-NII-2A	5260 - 5320	40.00	76.74	3072.00	Pass
802.11a/n/ac/ax	U-NII-2C	5500 - 5700	40.00	20.65	3072.00	Pass
802.11a/n/ac/ax	U-NII-3	5725 - 5850	40.00	7.67	3072.00	Pass
BT BR/EDR Chip 1	2.4 GHz	2400 - 2483.5	40.00	3.43	3072.00	Pass
BT BR/EDR Chip 2	2.4 GHz	2400 - 2483.5	40.00	1.84	3072.00	Pass

Table 2: FCC Exemption Evaluation Result

The computed value(s) are below the exemption limit(s), so these modes meet the requirements stated in FCC 47 CFR Part 1.1307.

Simultaneous transmission assessment:

The device under evaluation is able to transmit simultaneously using BT and Wi-Fi transmitters, therefore the most conservative approach for the evaluation of the simultaneous transmission will be:

Simultaneous technologies and modes	Result (\sum of Pout/Pmax ratios)	Verdict ($\sum \leq 1$)
802.11b/g/n/ax 2.4 GHz + BT BR/EDR Chip 1 2.4 GHz + BT BR/EDR Chip 2 2.4 GHz	0.02	Pass
802.11a/n/ac/ax U-NII-2A + BT BR/EDR Chip 1 2.4 GHz + BT BR/EDR Chip 2 2.4 GHz	0.03	Pass

Table 3: Simultaneous Result

Appendix B: FCC RF Exposure information

RF Exposure determination of exemption

According to FCC 47 CFR §1.1307 (b)(3) Determination of exemption:

(i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2), a single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

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

d = the separation distance (cm);

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP 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).

TABLE 1 TO §1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(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.

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

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for Pth, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section 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 including existing evaluated transmitters.

Pi = 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).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERPj = the ERP of fixed, mobile, or portable RF source j.

ERPth,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 formula of paragraph (b)(3)(i)(C) of this section.

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 at the location of exposure.

Exposure Limit,k = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from §1.1310 of this chapter.

RF Exposure evaluation

Limits for Maximum Permissible Exposure (MPE) for RF sources are defined in FCC 47 CFR “§1.1310 Radiation Exposure limits, paragraph (e)”:

TABLE 1 TO §1.1310(E)(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)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

Each supported transmission technology will be evaluated to determine if it is in compliance with limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

In order to perform the assessment, the following equations have been used for the calculations; these equations are accurate in the far-field of an antenna and will over-predict power density in the near field, where they could be used for making a "worst-case" or conservative prediction:

$$\text{Power density: } S[mW/cm^2] = \frac{P_{E.I.R.P.}[mW]}{4\pi R[cm]^2}$$

Where:

S = power density

$P_{E.I.R.P.}$ = Equivalent isotropically radiated power

R = distance to the center of radiation of the antenna (evaluation distance)

$$P_{E.I.R.P.} = P_T + G_T - L_C$$

Where:

P_T = transmitter time-averaged output power (including Duty Cycle and tune-up tolerance, if applicable)

G_T = gain of the transmitting antenna

L_C = signal attenuation in the connecting cable between the transmitter and the antenna if applicable