

# RF Exposure Assessment

**Report Reference: MDE\_VIS\_2017\_MPE\_04**

on

Navigation display module with BT  
connectivity

J1AB

FCC ID: NT8-J1AB

IC: 3043A-J1AB

**Test Laboratory:**

7layers GmbH  
Borsigstrasse 11  
40880 Ratingen  
Germany

**Note:**

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

**7layers GmbH**

Borsigstraße 11  
40880 Ratingen, Germany  
T +49 (0) 2102 749 0  
F +49 (0) 2102 749 350

**Geschäftsführer/**

**Managing Directors:**

Frank Spiller  
Bernhard Retka  
Alexandre Norré-Oudard

**Registergericht/registered:**

Düsseldorf HRB 75554  
USt-Id.-Nr./VAT-No. DE203159652  
Steuer-Nr./TAX-No. 147/5869/0385

*a Bureau Veritas  
Group Company*

*www.7layers.com*

**REPORT REFERENCE:**

MDE\_VIS\_2017\_MPE\_04

**Summary****Type of Report**

RF Exposure calculation for the Navigation display module with BT connectivity JDCP

**Applicable FCC and ISED Rules****For RF Exposure:**

OET Bulletin 65 Edition 97-01 August 1997  
FCC 47 CFR §1.1307  
FCC 47 CFR §1.1310  
RSS-102 Issue 5 – March 2015

| Report version control |              |                 |                  |
|------------------------|--------------|-----------------|------------------|
| Rev<br>Version         | Release date | Changes         | Version validity |
| -                      | 11.06.2021   | Initial version | Valid            |

  
(responsible for report)  
Mr. Imad Hjije

**REPORT REFERENCE:**

MDE\_VIS\_2017\_MPE\_04

**Administrative Data:**

**Testing Laboratory**

Company Name: 7layers GmbH  
Address: Borsigstr. 11  
40880 Ratingen  
Germany

Report Template Version: 2018-03-13

**Project Data**

Responsible for report: Mr. Imad Hjije  
Date of Report: 2021-07-08  
Testing Period: - (please see referenced test reports)

**Applicant Data**

Company Name: Visteon Corporation  
Address: One Village Center Drive  
Van Buren Township, MI, 48111,  
U.S.A  
Contact Person: Heidi Sepanic, Corporative Secretary

**Manufacturer Data**

Company Name: please see Applicant data  
Address: -  
-  
-  
Contact Person: -

## REPORT REFERENCE:

MDE\_VIS\_2017\_MPE\_04

## Test object Data

### General Description of Radio Device

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kind of Device product description           | Navigation Display Module with BT connectivity for two wheeler vehicle                                                                                                                                                                                                                                                                                                                         |
| Product name                                 | Navigation display module with BT connectivity                                                                                                                                                                                                                                                                                                                                                 |
| Type                                         | J1AB                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Declared EUT data by the supplier</b>     |                                                                                                                                                                                                                                                                                                                                                                                                |
| Voltage Type                                 | DC                                                                                                                                                                                                                                                                                                                                                                                             |
| Voltage Level                                | 13.5 V                                                                                                                                                                                                                                                                                                                                                                                         |
| Antenna / Gain                               | Integral / 2.0 dBi                                                                                                                                                                                                                                                                                                                                                                             |
| Tested Modulation Type                       | GFSK                                                                                                                                                                                                                                                                                                                                                                                           |
| General product description                  | A 1.49" TFT with TBT (Turn By Turn navigation) and FOTA feature for 2 wheeler products. The module is customized to suit premium variants for Royal Enfield models. The Module syncs up with mobile app developed by Royal Enfield. The app then transmits the TBT information from mobile to display module via Bluetooth. The SW updates or image changes if any, will be uploaded via FOTA. |
| Specific product description for the EUT     | BT-LE transceiver in the 2.4 GHz band.                                                                                                                                                                                                                                                                                                                                                         |
| EUT ports (connected cables during testing): | Cable Harness incl. DC                                                                                                                                                                                                                                                                                                                                                                         |
| Tested datarates                             | 1 Mbps                                                                                                                                                                                                                                                                                                                                                                                         |
| Special software used for testing            | NXP software provided by Applicant                                                                                                                                                                                                                                                                                                                                                             |

### Assessed Radio Devices

| Sample Name      | Sample Code                  | Description     |
|------------------|------------------------------|-----------------|
| EUT B            | DE1105009au01                | Radiated Sample |
| Sample Parameter | Value                        |                 |
| Serial No.       | -                            |                 |
| HW Version       | PWB25073                     |                 |
| SW Version       | V07.05                       |                 |
| Comment          | Sample with integral Antenna |                 |

| Sample Name      | Sample Code                                      | Description      |
|------------------|--------------------------------------------------|------------------|
| EUT C            | DE1105009ap01                                    | Conducted Sample |
| Sample Parameter | Value                                            |                  |
| Serial No.       | -                                                |                  |
| HW Version       | PWB25073                                         |                  |
| SW Version       | V07.05                                           |                  |
| Comment          | Sample with temporary external antenna connector |                  |

## REPORT REFERENCE:

MDE\_VIS\_2017\_MPE\_04

### General description of ancillary equipment

| Device | Details (Manufacturer, Type Model, HW, SW, S/N) | Description |
|--------|-------------------------------------------------|-------------|
| -      | -                                               | -           |

### General description of auxiliary equipment

| Device | Details (Manufacturer, Type Model, HW, SW, S/N) | Description          |
|--------|-------------------------------------------------|----------------------|
| AUX 1  | - , - , - , - , -                               | USB to TTL Converter |

### General description of setups

| Setup    | Details      | Description |
|----------|--------------|-------------|
| Setup_01 | EUT C, AUX 1 | -           |

### Documents used for assessment supplied to applicant

| Radio technology | Details                                                                                            | Description                                               |
|------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Bluetooth        | MKW36A/35A<br>An ultra-low power, highly integrated Bluetooth® Low Energy wireless microcontroller | FCC 15.247 Test Report:<br>max. <b>-4.1 dBm</b> conducted |

### Measured RF Output Power

Ambient temperature: 25 °C  
Air Pressure: 1007 hPa  
Humidity: 37 %  
BT LE 1 Mbit/s

| Band        | Channel No. | Frequency [MHz] | Peak Power [dBm] | Limit [dBm] | Margin to Limit [dB] | E.I.R.P [dBm] |
|-------------|-------------|-----------------|------------------|-------------|----------------------|---------------|
| 2.4 GHz ISM | 0           | 2402            | -4.9             | 30.0        | 34.9                 | -2.9          |
|             | 19          | 2440            | -4.6             | 30.0        | 34.6                 | -2.6          |
|             | 39          | 2480            | -4.1             | 30.0        | 34.1                 | -2.1          |

## REPORT REFERENCE:

MDE\_VIS\_2017\_MPE\_04

## RF Exposure Evaluation

| Standards                                 |
|-------------------------------------------|
| OET Bulletin 65 Edition 97-01 August 1997 |
| RSS-102 Issue 5 – March 2015              |

## Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

| Frequency range (MHz) | Power density (mW/cm <sup>2</sup> ) |
|-----------------------|-------------------------------------|
| 300 – 1,500           | f/1500                              |
| 1,500 – 100,000       | 1.0                                 |

Limits specified per RSS-102, Issue 5.

| Frequency range (MHz) | Power density (W/m <sup>2</sup> ) | Power density (mW/cm <sup>2</sup> ) |
|-----------------------|-----------------------------------|-------------------------------------|
| 300 – 6000            | $0.02619 f^{0.6834}$              | $mW/cm^2 = W/m^2 * 0.1$             |

Equation OET bulletin 65, page 18, edition 97-01: 
$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

Where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

## Test Protocol

| Operational Bands | Mode | Duty Cycle | Frequency (MHz) | Antenna Gain (dBi) | G                                            |                                | P                             |      | Equivalent conducted output power (mW) | S                              |                                 | Power Density value (mW/cm <sup>2</sup> ) | Margin to FCC Limit (mW/cm <sup>2</sup> ) | Margin to IC Limit (mW/cm <sup>2</sup> ) |
|-------------------|------|------------|-----------------|--------------------|----------------------------------------------|--------------------------------|-------------------------------|------|----------------------------------------|--------------------------------|---------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|
|                   |      |            |                 |                    | Antenna Gain -numeric- (mW/cm <sup>2</sup> ) | Output Power -conducted- (dBm) | Output Power -conducted- (mW) |      |                                        | IC Limit (mW/cm <sup>2</sup> ) | FCC Limit (mW/cm <sup>2</sup> ) |                                           |                                           |                                          |
| 2.4GHz            | BLE  | 100%       | 2480            | 2                  | 1.5849                                       | -4.10                          | 0.39                          | 0.39 | 0.5469                                 | 1.00                           | 0.0001                          |                                           | 0.9999                                    | 0.5468                                   |

Considering a Tune up values of max +/- 1dB, the final calculation would be:

| Operational Bands | Frequency (MHz) | Antenna Gain (dBi) | G                                            |                                | Duty Cycle correction factor | P                            |                               | Output Power (EIRP) (mW) | IC Limit (mW/cm <sup>2</sup> ) | S                               |        | Power Density value (mW/cm <sup>2</sup> ) | Margin to FCC Limit (mW/cm <sup>2</sup> ) | Margin to IC Limit (mW/cm <sup>2</sup> ) |
|-------------------|-----------------|--------------------|----------------------------------------------|--------------------------------|------------------------------|------------------------------|-------------------------------|--------------------------|--------------------------------|---------------------------------|--------|-------------------------------------------|-------------------------------------------|------------------------------------------|
|                   |                 |                    | Antenna Gain -numeric- (mW/cm <sup>2</sup> ) | Output Power -conducted- (dBm) |                              | Max. mean output power (dBm) | Output Power -conducted- (mW) |                          |                                | FCC Limit (mW/cm <sup>2</sup> ) |        |                                           |                                           |                                          |
| 2.4 GHz           | 2480            | 2                  | 1.5849                                       | -3.10                          | 0                            | -3.10                        | 0.49                          | 0.78                     | 0.5469                         | 1.0000                          | 0.0002 |                                           | 0.9998                                    | 0.5467                                   |

<End of Assessment>