

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.

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Summary

Type of Report

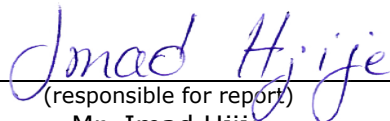
RF Exposure calculation for the Navigation display module with BT connectivity JDCP

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 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: -

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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
Declared EUT data by the supplier	
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	

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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 An ultra-low power, highly integrated Bluetooth® Low Energy wireless microcontroller	FCC 15.247 Test Report: max. -4.1 dBm 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

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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 ²)
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 ²)	Power density (mW/cm ²)
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		S		Power Density value (mW/cm ²)	Margin to FCC Limit (mW/cm ²)	Margin to IC Limit (mW/cm ²)
					Antenna Gain -numeric- (mW/cm ²)	Output Power -conducted- (dBm)	Output Power -conducted- (mW)	Equivalent conducted output power (mW)	IC Limit (mW/cm ²)	FCC Limit (mW/cm ²)			
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		P		S		IC Limit (mW/cm ²)	FCC Limit (mW/cm ²)	Power Density value (mW/cm ²)	Margin to FCC Limit (mW/cm ²)	Margin to IC Limit (mW/cm ²)
			Antenna Gain -numeric- (mW/cm ²)	Output Power -conducted- (dBm)	Max. mean output power (dBm)	Output Power -conducted- (mW)	Output Power (EIRP) (mW)						
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>