KDB 447498 D03
47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

MODULE VIEDO ROUTER

Model: 68494731, 68379840, 68449335

Trade Name: STELLANTIS

Issued to

JET OPTOELECTRONICS CO., LTD.
3F., No.300, Yangguang St., Neihu Dist., Taipei City 11491, Taiwan

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan. (R.O.C.)
Issue Date: March 26, 2021

Note: This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF, NIST or any government agencies. The test results in the report only apply to the tested sample.

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 26, 2021	Initial Issue	ALL	Doris Chu

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION 4
2. LIMIT 5
3. EUT SPECIFICATION 6
4. TEST RESULTS 8
5. MAXIMUM PERMISSIBLE EXPOSURE.....9
6. SIMULTANEOUS TRANSMISSION SAR ANALYSIS.....10

Report No.: T201222W02-MF

1. TEST RESULT CERTIFICATION

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
KDB 447498 D03 47 C.F.R. Part 1, Subpart I, Section 1.1310 47 C.F.R. Part 2, Subpart J, Section 2.1091	No non-compliance noted
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

Approved by:

Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

2. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

§1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of FCC part 2.1093 of the chapter.

TABLE 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)
(A) 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
(B) 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

Note 1 to Table 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

3. EUT SPECIFICATION

EUT	MODULE VIEDO ROUTER
Model	68494731, 68379840, 68449335
Trade Name	STELLANTIS
Model Discrepancy	See table below
Received Date	December 22, 2020
Frequency band (Operating)	☒ Bluetooth: 2402MHz-2480MHz ☒ 802.11b/g/n HT20: 2412MHz ~ 2462 MHz ☒ 802.11n HT40: 2422MHz ~ 2452MHz ☒ 802.11a/n HT20: 5180MHz ~ 5240MHz / 5260 ~ 5320MHz / 5500 ~ 5700MHz / 5745MHz ~ 5825MHz ☒ 802.11n HT40: 5190MHz ~ 5230MHz / 5270 ~ 5310MHZ / 5510 ~ 5670MHz / 5755MHz ~ 5795MHz ☒ 802.11ac VHT80: 5210MHz / 5290MHz / 5530 MHz~5610MHz / 5775MHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna Specification	BT: Gain :1 dBi WIFI 2.4GHz: Chain 0: Gain :1 dBi Chain 1: Gain :1 dBi WIFI 5GHz: Chain 0: Gain :2.6 dBi Chain 1: Gain :2.6 dBi

Model Number	Stand Position	Blue-Ray	Earphone
68494731	Type 1	O	O
68379840	Type 2	X	X
68449335	Type 3	X	X

BT:	Directional Gain :	1.00 dBi	(Numeric gain:	1.26)	Worst
2.4GHz:	Directional Gain :	1.00 dBi	(Numeric gain:	1.26)	Worst
5GHz:	Directional Gain :	2.60 dBi	(Numeric gain:	1.82)	Worst

Report No.: T201222W02-MF

Maximum Measurement Average Power	

BT	4.31 dBm	(2.698 mW)
2.4GHz		
IEEE 802.11b Mode:	16.14 dBm	(41.115 mW)
IEEE 802.11g Mode:	14.11 dBm	(25.763 mW)
IEEE 802.11n HT 20 Mode:	12.61 dBm	(18.239 mW)
IEEE 802.11n HT 40 Mode:	10.82 dBm	(12.078 mW)
5GHz		
IEEE 802.11a Mode:	12.00 dBm	(15.849 mW)
IEEE 802.11n HT 20 Mode:	10.78 dBm	(11.967 mW)
IEEE 802.11n HT 40 Mode:	10.10 dBm	(10.233 mW)
IEEE 802.11ac VHT 80 Mode:	12.17 dBm	(16.482 mW)

Maximum tune up power	

BT	5.00 dBm	(3.162 mW)
2.4GHz		
IEEE 802.11b Mode:	17.00 dBm	(50.119 mW)
IEEE 802.11g Mode:	15.00 dBm	(31.623 mW)
IEEE 802.11n HT 20 Mode:	13.50 dBm	(22.387 mW)
IEEE 802.11n HT 40 Mode:	11.50 dBm	(14.125 mW)
5GHz		
IEEE 802.11a Mode:	12.50 dBm	(17.783 mW)
IEEE 802.11n HT 20 Mode:	11.50 dBm	(14.125 mW)
IEEE 802.11n HT 40 Mode:	10.50 dBm	(11.220 mW)
IEEE 802.11ac VHT 80 Mode:	12.50 dBm	(17.783 mW)

Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: The variant model numbers / trademarks are assessed as identical in hardware and software to each other, hence all variants are fully covered by the test results in this test report without further verification test.
4. The tune up power referred the AVG power of the test report T201222W02-RP1, T201222W02-RP2, T201222W02-RP3, T201222W02-RP4 and T201222W02-RP5 for RF Exposure assessment purpose.

Report No.: T201222W02-MF

4. TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ **Equation 1**

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

5. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

BT:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
39	2441	3.162	1.26	20	0.0008	1

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
11	2462	50.119	1.26	20	0.0126	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	31.623	1.26	20	0.0079	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	22.387	1.26	20	0.0056	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
6	2437	14.125	1.26	20	0.0035	1

IEEE 802.11a mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
157	5785	17.783	1.82	20	0.0064	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
149	5745	14.125	1.82	20	0.0051	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
54	5270	11.220	1.82	20	0.0041	1

IEEE 802.11ac VHT80 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
42	5210	17.783	1.82	20	0.0064	1

6. SIMULTANEOUS TRANSMISSION SAR ANALYSIS

Both of the WiFi and Bluetooth can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WiFi + Bluetooth

Therefore, the worst-case situation is 0.0126 / 1 + 0.0008 / 1 = 0.0134, which is less than “1”.

--End of Report--