

RF Exposure Report

Report No.: SABHQC-WTW-P20110170A

FCC ID: B3QT99H209

Test Model: T99H209

Received Date: 2021/12/3

Test Date: 2022/1/14

Issued Date: 2022/2/23

Applicant: BROTHER INDUSTRIES, LTD.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABHQC-WTW-P20110170A	Original release.	2022/2/23

1 Certificate of Conformity

Product: IEEE802.11a/b/g/n/ac (1x1)+BT 5.0 Combo Module

Brand: Brother

Test Model: T99H209

Sample Status: Engineering sample

Applicant: BROTHER INDUSTRIES, LTD.

Test Date: 2022/1/14

Standards: FCC Part 2 (Section 2.1091)

References Test Guidance KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

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Date:

2022/2/23

Cherry Chuo / Specialist

Approved by :

Clark Lin

Date:

2022/2/23

Clark Lin / Technical Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.
So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	3.65	2.4~2.4835	PCB	None
	3.98	5.15~5.85		

*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result

WLAN 2.4GHz & Bluetooth was copied from the original test report (Report No.: SABHQC-WTW-P20110170).

Operation Mode	Max Power (dBm)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Pass/Fail
WLAN 2.4GHz	20.91	123.31	3.65	20	0.05685	1	Pass
WLAN 5GHz (U-NII-1)	20.93	95.499	3.98	20	0.0475	1	Pass
WLAN 5GHz (U-NII-2A)	20.84	95.94	3.98	20	0.04772	1	Pass
WLAN 5GHz (U-NII-2C)	20.74	97.051	3.98	20	0.04828	1	Pass
WLAN 5GHz (U-NII-3)	20.72	103.276	3.98	20	0.05137	1	Pass
Bluetooth	7.04	5.058	3.65	20	0.00233	1	Pass

NOTE:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 5GHz + Bluetooth = $0.05137 / 1 + 0.00233 / 1 = 0.05370$

Therefore the maximum calculations of above situations are less than the "1" limit.

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