



RADIO EXPOSURE TEST REPORT

FCC ID : NKR-SWA52
Equipment : Wireless Audio Module
Brand Name : WNC
Model Name : SWA52
Applicant : Wistron NeWeb Corporation
20 Park Avenue II, Hsinchu Science Park, Hsinchu
308 Taiwan
Manufacturer : Wistron NeWeb Corporation
20 Park Avenue II, Hsinchu Science Park, Hsinchu
308 Taiwan
Standard : 47 CFR Part 2.1091

The product was received on Aug. 10, 2021, and testing was started from Sep. 03, 2021 and completed on Nov. 17, 2021. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FA5N2023-03	01	Initial issue of report	Nov. 24, 2021



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Jessie Wei



1 General Description

1.1 EUT General Information

RF General Information			
Frequency Range (MHz)	Bandwidth	Operating Frequency (MHz)	Modulation Type
5150-5250	2MHz	5155.35-5247.35	pi/4-DQPSK
	4MHz	5158.35-5246.35	
5725-5850	2MHz	5726.35-5848.35	
	4MHz	5727.35-5847.35	
5850-5895	2MHz	5850.35-5874.35	
	4MHz	5849.35-5875.35	

1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)			Remark
						UNII 1	UNII 3	UNII 4	
1	1	WNC	WNC	Printed Antenna	N/A	4.32	4.90	4.50	Internal
2	2	WNC	WNC	Printed Antenna	N/A	2.40	3.50	2.96	
3	1	KINGRF	IA.0355.LA.2F1	PCB Antenna	I-PEX	3.03	4.23	3.01	External

Note: The above information was declared by manufacturer.

For EUT 1:

The EUT supports the antenna with TX and RX diversity functions.

Both Ant. 1(Port 1) and Ant. 2(Port 2) support transmit and receive functions, but only one of them will be used at one time.

The Ant. 1(Port 1) generated the worst case, so it was selected to test and record in the report.

For EUT 2:

Ant. 3(Port 1) can be used as transmitting/receiving antenna.



1.3 Table for EUT type information

EUT Type	Module	Firmware	Description
EUT 1 (Internal)	TX	8.103.15	The variation of EUT is for different firmware.
	RX	8.103.1	
EUT 2 (External)	TX	8.103.15	
	RX	8.103.1	

Note1: From the above models, EUT 1 was selected as representative model for the test and its data was recorded in this report.

Note2: The above information was declared by manufacturer.

1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA5N2023-02.

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
<ol style="list-style-type: none"> Change the external antenna (New antenna Brand: KINGRF, Model name: IA.0355.LA.2FI) Changing operating frequency to "5726.35~5848.35 MHz" from "5726.35~5824.35 MHz" for Bandwidth 2MHz of UNII 3. Changing operating frequency to "5727.35~5847.35 MHz" from "5727.35~5825.35 MHz" for Bandwidth 4MHz of UNII 3. Adding the UNII 4 Band. 	Exposure evaluation

1.5 Accessories

N/A

1.6 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

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



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For EUT 1 <Internal antenna>:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.8G;G7D	4.90	12.20	17.10	0.50	17.60	0.05754	20	0.01145	1.00000
5.87G;G7D	4.50	12.26	16.76	0.50	17.26	0.05321	20	0.01059	1.00000

For EUT 1 <External antenna>:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.2G;G7D	3.03	9.93	12.96	0.50	13.46	0.02218	20	0.00441	1.00000
5.8G;G7D	4.23	12.20	16.43	0.50	16.93	0.04932	20	0.00981	1.00000
5.87G;G7D	3.01	12.26	15.27	0.50	15.77	0.03776	20	0.00751	1.00000

————THE END————