RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part:	**FCC Part 2 (Section 2.1091)**
Report No.:	MFBCKS-WTW-P25020597
FCC ID:	NKR-DLSAWI13WW
Product:	WNC LPWA Module
Brand:	WNC
Model No.:	DLSA-WI13-WW
Received Date:	2025/2/21
Test Date:	2025/6/23
Issued Date:	2025/7/21
Applicant:	WNC Corporation
Address:	20 Park Ave. II, Hsinchu Science Park,Hsinchu 300, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Approved by: Jeremy . Lin , **Date:** **2025/7/21**

Jeremy Lin / Project Engineer

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Prepared by : Gina Liu / Specialist

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Release Control Record

Issue No.	Description	Date Issued
MFBCKS-WTW-P25020597	Original release.	2025/7/21

1 Certificate

Product:	WNC LPWA Module
Brand:	WNC
Test Model:	DLSA-WI13-WW
Sample Status:	Engineering sample
Applicant:	WNC Corporation
Test Date:	2025/6/23
FCC Rule Part:	FCC Part 2 (Section 2.1091)
Standard:	KDB 447498 D04 Interim General RF Exposure Guidance v01

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 RF characteristics under the conditions specified in this report.

2 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).
(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.
(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

➢ Limits for General Population/Uncontrolled Exposure

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
300-1,500	…	…	f/1500	<30
1,500-100,000	…	…	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

➢ Limits for Occupational/Controlled Exposure

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				
0.3-3.0	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

f = frequency in MHz. * = Plane-wave equivalent power density.

MPE-based Exemption – §1.1307(b)(3)(i)(C)

- The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.
- Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

RF Source frequency (MHz)	Minimum Distance		Threshold ERP (watts)
	$\lambda_L/2\pi$	$\lambda_H/2\pi$	
0.3-1.34	159 m–35.6 m		1,920 R^2.
1.34-30	35.6 m–1.6 m		3,450 R^2/f^2.
30-300	1.6 m–159 mm		3.83 R^2.
300-1,500	159 mm–31.8 mm		0.0128 R^2f.
1,500-100,000	31.8 mm–0.5 mm		19.2 R^2.
R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.			

Fixed RF sources operating in the same time-averaging period – §1.1307(b)(3)(ii)(B)

- Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) should be used to determine exemption for simultaneous transmission according to Formula below,

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i.*

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j,* at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Exposure Limit$_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k,* as applicable from § 1.1310 of this chapter.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

ERP_j = the ERP of fixed, mobile, or portable RF source *j.*

Evaluated$_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

3 Test Results

Environmental Conditions:	25°C, 60% RH	Tested By:	Match Tsui

Cat-M1

For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
Cat-M1 B2	1850.7-1909.3	371.535	2.03	361.41	20	768	Pass
Cat-M1 B4	1710.7-1754.3	371.535	2.03	361.41	20	768	Pass
Cat-M1 B5	824.7-848.3	371.535	2.63	414.954	20	422.246	Pass
Cat-M1 B8	898.2-899.8	371.535	2.63	414.954	20	459.878	Pass
Cat-M1 B12	699.7-715.3	371.535	1.63	329.61	20	358.246	Pass
Cat-M1 B13	779.5-784.5	371.535	1.63	329.61	20	399.104	Pass
Cat-M1 B14	790.5-795.5	371.535	1.63	329.61	20	404.736	Pass
Cat-M1 B25	1850.7-1914.3	371.535	2.03	361.41	20	768	Pass
Cat-M1 B26 (Part 22)	824.7-848.3	371.535	2.63	414.954	20	422.246	Pass
Cat-M1 B26 (Part 90)	814.7-823.3	371.535	2.63	414.954	20	417.126	Pass
Cat-M1 B66	1720-1770	371.535	2.03	361.41	20	768	Pass
Cat-M1 B85	703-711	371.535	1.63	329.61	20	359.936	Pass
RFID	902.2-927.8	-	-	0.3819	20	461.926	Pass

Notes:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Calculate the ERP of RFID from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the distance, in 3 m.
   ERP = 93.2 + 20 x Log(3) − 104.77 − 2.15 = -4.18 dBm (0.3819 mW)

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
RFID	902.2-927.8	0.3819	461.926	0.001	0.984	1	Pass
Cat-M1 B26 (Part 22)	824.7-848.3	414.954	422.246	0.983			

NB-IoT

For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
NB-IoT B2	1850.2-1909.8	371.535	2.03	361.41	20	768	Pass
NB-IoT B4	1710.2-1754.8	371.535	2.03	361.41	20	768	Pass
NB-IoT B5	824.2-848.8	371.535	2.63	414.954	20	421.99	Pass
NB-IoT B8	897.7-900.3	371.535	2.63	414.954	20	459.878	Pass
NB-IoT B12	699.2-715.8	371.535	1.63	329.61	20	357.99	Pass
NB-IoT B13	777.2-786.8	371.535	1.63	329.61	20	397.926	Pass
NB-IoT B14	788.2-797.8	371.535	1.63	329.61	20	403.558	Pass
NB-IoT B17	704.2-715.8	371.535	1.63	329.61	20	360.55	Pass
NB-IoT B25	1850.2-1914.8	371.535	2.03	361.41	20	768	Pass
NB-IoT B26 (Part 22H)	824.2-848.8	371.535	2.63	414.954	20	421.99	Pass
NB-IoT B26 (Part 90S)	814.2-823.8	371.535	2.63	414.954	20	416.87	Pass
NB-IoT B66	1710.2-1779.8	371.535	2.03	361.41	20	768	Pass
NB-IoT B85	698.2-715.8	371.535	1.63	329.61	20	357.478	Pass
RFID	902.2-927.8	-	-	0.3819	20	461.926	Pass

Notes:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Calculate the ERP of RFID from the radiated field strength:
   ERP (dBm) = Radiated field strength (dBuV/m) + 20 x Log(d) − 104.77 − 2.15
   d is the distance, in 3 m.
   ERP = 93.2 + 20 x Log(3) − 104.77 − 2.15 = -4.18 dBm (0.3819 mW)

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
NB-IoT B26 (Part 22H)	824.2-848.8	414.954	421.99	0.983	0.984	1	Pass
RFID	902.2-927.8	0.3819	461.926	0.001			

4 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

5 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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