

FCC RF Exposure

Applicant : Shinwa industries(China) ltd
Address : No.26, HuiFeng West 2 Road, Zhongkai High-Tech Park, Huizhou, Guangdong, China
Product Name : Car Kit WiFi Module
Brand Mark : Shinwa
Model no. : WF-MA80-2
Series model : N/A
FCC ID : ZWYMA802
Report Number : BLA-EMC-202510-A4306
Date of Receipt : Oct. 23, 2025
Date of Test : Oct. 23, 2025 to Nov. 14, 2025
Test Standard : 47 CFR Part 15, Part1.1307
47 CFR Part 15, Part2.1091
KDB447498D04 General RF Exposure Guidance v01
Test Result : Pass

Compiled by: Mark Chen

Review by: Xavier

Approved by:

Zheng

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Revise Record

Version No.	Date	Description
01	Nov. 26, 2025	Original

1 General information

1.1 General information

Applicant	Shinwa industries(China) ltd
Address	No.26, HuiFeng West 2 Road, Zhongkai High-Tech Park, Huizhou, Guangdong, China
Manufacturer	Shinwa industries(China) ltd
Address	No.26, HuiFeng West 2 Road, Zhongkai High-Tech Park, Huizhou, Guangdong, China
Factory	Shinwa industries(China) ltd
Address	No.26, HuiFeng West 2 Road, Zhongkai High-Tech Park, Huizhou, Guangdong, China

1.2 General description of EUT

Product Name	Car Kit WiFi Module
Model No.	WF-MA80-2
Operation Frequency	BLE&BT Classic: 2402MHz-2480MHz 2.4GWIFI: IEEE 802.11b/g/n(HT20)/ax(HE20): 2412MHz to 2462MHz IEEE 802.11n(HT40)/ax(HE40): 2422MHz to 2452MHz 5GWIFI: U-NII-1: 5150MHz-5250MHz U-NII-2A: 5250MHz-5350MHz U-NII-2C: 5470MHz-5725MHz U-NII-3: 5745MHz-5850MHz
Modulation Type	BLE: GFSK BT Classic: GFSK, $\pi/4$ DQPSK, 8DPSK 2.4GWIFI: 802.11b: DSSS(CCK/QPSK/BPSK) 802.11g: OFDM(BPSK/QPSK/16QAM/64QAM) 802.11n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ax(HE20 and HE40):OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) 5GWIFI: IEEE 802.11a:OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40):OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE for 802.11ac :OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ax(HE20/HE40/HE80):OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Number of Channels	BLE:40 BT: 79

	2.4GWIFI: 802.11b/g:11 Channels 802.11n (HT20)/ax(HE20): 11 Channels 802.11n (HT40)/ax(HE40): 7 Channels 5GWIFI: U-NII-1: 802.11a/802.11n(HT20)/802.11ac(HT20)/802.11ax(HE20): 4, 802.11n(HT40)/802.11ac(HT40)/802.11ax(HE40):2, 802.11ac(HT80)/ax(HE80): 1 U-NII-2A: 802.11a/802.11n(HT20)/802.11ac(HT20)/802.11ax(HE20): 4, 802.11n(HT40)/802.11ac(HT40)/802.11ax(HE40):2, 802.11ac(HT80)/ax(HE80): 1 V-NII-2C: 802.11a/802.11n(HT20)/802.11ac(HT20)/802.11ax(HE20): 8, 802.11n(HT40)/802.11ac(HT40)/802.11ax(HE40):3, 802.11ac(HT80)/ax(HE80): 1 U-NII-3: 802.11a/802.11(HT20)/802.11ac(HT20)/802.11ax(HE20): 5, 802.11n(HT40)/802.11ac(HT40)/802.11ax(HE40): 2, 802.11ac(HT80)/ax(HE80): 1
Antenna Type	External antenna
Antenna Gain	BLE/BT Classic/2.4GWIFI: 2.2dBi 5G WIFI: 3.6dBi
Power supply	DC 3.3V
Hardware Version	N/A
Software Version	N/A
Note: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.	

2 RF Exposure Compliance Requirement

2.1 Standard Requirement

According to 447498 D04 Interim General RF Exposure Guidance v01

Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

2.2 Limits

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

Example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
	300	39	65	88	110	129	148	166	184	201	217
	450	22	44	67	89	112	135	158	180	203	226
	835	9	25	44	66	90	116	145	175	207	240
	1900	3	12	26	44	66	92	122	157	195	236
	2450	3	10	22	38	59	83	111	143	179	219
	3600	2	8	18	32	49	71	96	125	158	195
	5800	1	6	14	25	40	58	80	106	136	169

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B. 1})$$

2.3 Result

$$\text{EIRP} = \text{pt} \times \text{gt} = (\text{E} \times \text{d})^{2/30}$$

Where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m

d = measurement distance in meters (m)

$$\text{Spot} = (\text{E} \times \text{d})^{2/30} \times \text{gt}$$

Separation distance= 20cm

BLE/BT Classic/2.4GWIFI Antenna Gain: 2.2dBi

5G WIFI Antenna Gain: 3.6dBi

BLE worse case: **1.791dBm @ 2402MHz**

$$\text{ERP} = 1.791 + 2.2 - 2.15 = 1.841 \text{ dBm} = 1.528 \text{ mW} < 3060 \text{ mW}$$

$$\text{MPE ratio(BLE)} = 1.528 / 3060 = 0.00050$$

BT Classic worse case: **2.657dBm @ 2402MHz**

$$\text{ERP} = 2.657 + 2.2 - 2.15 = 2.707 \text{ dBm} = 1.865 \text{ mW} < 3060 \text{ mW}$$

$$\text{MPE ratio(BT Classic)} = 1.865 / 3060 = 0.00061$$

2.4G WIFI worse case: **14.467dBm @ 2412MHz**

$$\text{ERP} = 14.467 + 2.2 - 2.15 = 14.517 \text{ dBm} = 28.294 \text{ mW} < 3060 \text{ mW}$$

$$\text{MPE ratio(2.4GWIFI)} = 28.294 / 3060 = 0.0092$$

5G WIFI worse case: **13.973dBm @ 5260MHz**

$$\text{ERP} = 13.973 + 3.6 - 2.15 = 15.423 \text{ dBm} = 34.858 \text{ mW} < 3060 \text{ mW}$$

$$\text{MPE ratio(5GWIFI)} = 34.858 / 3060 = 0.01140$$

For Simultaneous Transmission :

As MPE ratio (BLE+BT Classic+2.4GWIFI+5GWIFI)

$$= 0.00050 + 0.00061 + 0.0092 + 0.01140 = 0.02171 < 1,$$

Comply with RF exposure exemption limit.

----END OF REPORT----

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