

# TEST REPORT

**Applicant:** SG Wireless Limited  
**Address:** Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong  
**Equipment Type:** F1 Smart Module  
**Model Name:** SGW3101  
**Brand Name:** SG Wireless  
**FCC ID:** 2AS9409  
**Test Standard:** 47 CFR Part 2.1091  
KDB 447498 D04 v01  
**Sample Arrival Date:** Sep. 23, 2024  
**Test Date:** May 15, 2025 - May 16, 2025  
**Date of Issue:** Jun. 19, 2025

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Xu Rui**Checked by:** Zong Liyao**Approved by:** Tolan Tu

(Testing Director)



**Revision History**

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Jun. 19, 2025</u>	<u>Initial Issue</u>

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## 1 GENERAL INFORMATION

### 1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

### 1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China <input checked="" type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	SG Wireless Limited
Address	Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong

### 2.2 Manufacturer Information

Manufacturer	SG Wireless Limited
Address	Unit 4, 5/F, Sun Fung Industrial Building, 8 Ma Kok Street, Tsuen Wan, New Territories, Hong Kong

### 2.3 General Description for Equipment under Test (EUT)

EUT Name	F1 Smart Module
Model Name Under Test	SGW3101
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	1.2.3
Software Version	B0.2.0b0
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

### 2.4 Technical Information

Network and Wireless connectivity	Bluetooth (BLE) WIFI 802.11b, 802.11g, 802.11n(HT20/40)
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth, WIFI	
Frequency Range	Bluetooth	2400 ~ 2480 MHz
	802.11b/g	2412 ~ 2462 MHz
	802.11n(HT20/HT40)	2412 ~ 2462 MHz
Antenna Type	Bluetooth: Monopole Antenna (External) WLAN: Monopole Antenna (External)	
Exposure Category	General Population/Uncontrolled Exposure	
Product Type	Mobile Device	

### 3 SUMMARY OF TEST RESULT

#### 3.1 Test Standards

No.	Identity	Document Title
1	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

#### 3.2 Limit Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices

## 4 DEVICE CATEGORY AND LEVELS LIMITS

### Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

### FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP<sub>20cm</sub> in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

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

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole).

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P<sub>th</sub> (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P<sub>th</sub> is given by Formula (B.2).

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

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). The 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

## 5 ASSESSMENT RESULT

### 5.1 Output Power

#### SGW3531

Mode	Bluetooth
Conducted Power (dBm)	18.23
Antenna Gain (dBi)	3.00
EIRP (dBm)	21.23

Note: This table listed the worst case power value, please refer to BL-SZ2430170-601 report for more details.

Mode	2.4G WIFI
Conducted Power (dBm)	15.99
Antenna Gain (dBi)	3.00
EIRP (dBm)	18.99

Note: This table listed the worst case power value, please refer to BL-SZ2430170-602 report for more details.

#### SGW3101

Mode	Bluetooth
Conducted Power (dBm)	15.51
Antenna Gain (dBi)	3.00
EIRP (dBm)	18.51

Note: This table listed the worst case power value, please refer to BL-SZ2460359-601 report for more details.

Mode	2.4G WIFI
Conducted Power (dBm)	13.15
Antenna Gain (dBi)	3.00
EIRP (dBm)	16.15

Note: This table listed the worst case power value, please refer to BL-SZ2460359-602 report for more details.

## 5.2 Tune-up power

### SGW3531

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	[17.00,19.00]	[20.00,22.00]	[17.85,19.85]
2.4G WIFI	[15.00,17.00]	[18.00,20.00]	[15.85,17.85]

Note1: ERP= EIRP -2.15dB.  
 Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.

### SGW3101

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	[15.00,17.00]	[18.00,20.00]	[15.85,17.85]
2.4G WIFI	[12.00,14.00]	[15.00,17.00]	[12.85,14.85]

Note1: ERP= EIRP -2.15dB.  
 Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.

## 5.3 RF Exposure Evaluation Result

### SGW3531

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Power / Limit	Verdict
Bluetooth	19.85	96.61	200	3060.00	0.032	Pass
2.4G WIFI	17.85	60.95	200	3060.00	0.020	Pass

### SGW3101

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Power / Limit	Verdict
Bluetooth	17.85	60.95	200	3060.00	0.020	Pass
2.4G WIFI	14.85	30.55	200	3060.00	0.010	Pass

## 5.4 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

## Statement

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--END OF REPORT--