RF EXPOSURE EVALUATION REPORT

Application No.:	GZCR2410001171ME
Applicant:	14190777 Canada Inc.
Address of Applicant:	1273 North Service Road Oakville ON L6H 1A7 Canada
Manufacturer:	14190777 Canada Inc.
Address of Manufacturer:	1273 North Service Road Oakville ON L6H 1A7 Canada
Factory:	Jetta Company Limited
Address of Factory:	333 Cai Xin Road, Lan He Zehn, Nan Sha Qu, Guangzhou City, China
Product Name:	Karie Duo
Model No.:	AA-DUO-1.0
Trade Mark:	Karie Duo
Standard(s) :	KDB 447498 D01 V06
	47 CFR Part 1.1310
Date of Receipt:	2024-10-09
Date of Evaluation:	2024-11-25 to 2024-11-25
Date of Issue:	2025-01-10
Evaluation Result:	**Pass***

* In the configuration evaluated, the EUT complied with the standards specified above.

Ricky Liu
Manager

Revision Record			
Version	**Report No.**	**Date**	**Remark**
01	GZCR241000117108	2025-01-10	Original

Authorized for issue by:				
		Jim Li **Jim Li/Project Engineer**		
		Vico Cui **Vico Cui/Reviewer**		

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2 Evaluation Summary

Item	Standard	Method	Requirement	Result
RF Exposure	RSS-102 Issue 6, December 15, 2023	RSS-102 Issue 6, December 15, 2023	RSS-102 Issue 6, December 15, 2023	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

3 Contents

Page

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 14.6 V powered by built-in battery as below for normal working:
	Model: 18650-4S2P
	Rated: DC 14.6 V, 5000mAh, 73.0Wh
	DC 19 V powered by AC/DC adapter as below for charging:
	Model: AD1003-1905200D
	Input: AC 100-240 V, 50-60 Hz, 1.5 A Max
	Output: DC 19.0 V, 5.2 A, 98.8W
Cable(s):	For main unit:
	DC input ports;
	For AC/DC adapter:
	AC mains
	DC output cables (unshielded, 1.5m)
RF Parameter:	Please refer to test report GZCR241000117102 for 2.4GHz Wi-Fi function
	Please refer to test report GZCR241000117103 for 5GHz Wi-Fi function
	Please refer to test report GZCR241000117104 for BLE function
	Please refer to test report GZCR241000117105 for BT function
	Please refer to test report GZCR241000117106 for NFC function
	Please refer to FCC ID: XMR201903EG25G for GSM/WCDMA/LTE function

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.

4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None

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5 Technical Requirements Specification

5.1 General Description of Applied Standards

KDB447498D01 General RF Exposure Guidance v06

4.3.1. 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.

5.2 RF Exposure Evaluation

5.2.1 Limit & Test Method

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 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)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

Friis Formula

Friis transmission formula: $P_d = (P_{out}*G)/(4* P_i * R^2)$

Where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

P_i = 3.1416

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

P_d id the limit of MPE, 1 mW/cm^2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.2.2 Conclusion

For NFC

1, Maximum transmit power

The Power Data is based on the RF Test Report GZCR241000117106.

Test Mode	Test Channel[MHz]	Power[dBuV/m]	Test distance[m]
ASK	13.56	63.19	3

2, RF Exposure Calculation

The max Radiated Power is 63.19 dBuV/m@ 3 m.

According to the formula. calculate the P test result:

E(dBuV/m)@0.005m= E(dBuV/m)@3m+40*log[E(dBuV/m)@0.005m+3/0.005] = 174.32 (dBuV/m)@3m

$E(V/m)@0.005m=10^{[E(dBuV/m)@0.005m/20]}*10^{-6}$= 519.7596 (V/m)@0.005m

P= (E*d)^2/30 = 225.1250 mW

	Evaluation method	Exempt Limit(mW)	Verdict
☒	Blanket 1 mW Blanket Exemption	1mW	Yes
☐	MPE-based Exemption(ERP)	7mW(ERP)	--
☐	SAR-based Exemption(P_{th})	2.744mW	--

So, the SAR report is not required.

For GSM/WCDMA/LTE

Normal use condition for Distance between antenna and body: 20cm declared by applicant

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (dBm)	EIRP(ERP) Limit (dBm)	Output Power to Antenna (mw)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)	Gain according to EIRP (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM850	824.2	2.29	25.81	25.95	38.45	381.0658	0.1284	0.5495	14.79	8.60	8.60	Pass
GSM1900	1850.2	1.59	22.81	24.40	33.00	190.9853	0.0548	1.0000	10.19	14.20	10.19	Pass
WCDMA B2	1852.4	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
WCDMA B4	1712.4	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
WCDMA B5	826.4	2.29	25.00	25.14	38.45	316.2278	0.1066	0.5509	15.60	9.42	9.42	Pass
LTE B2	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B4	1710.7	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
LTE B5	824.70	2.29	25.00	25.14	38.45	316.2278	0.1066	0.5498	15.60	9.41	9.41	Pass
LTE B7	2502.50	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass
LTE B12	699.70	3.26	25.00	26.11	34.77	316.2278	0.1333	0.4665	11.92	8.70	8.70	Pass
LTE B13	779.50	4.45	25.00	27.30	34.77	316.2278	0.1753	0.5197	11.92	9.16	9.16	Pass
LTE B25	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B26(814-824)	814.7	2.53	25.00	25.38	50.00	316.2278	0.1126	0.5431	27.15	9.36	9.36	Pass
LTE B26(824-849)	824.7	2.53	25.00	25.38	38.45	316.2278	0.1126	0.5498	15.60	9.41	9.41	Pass
LTE B38	2572.5	2.06	25.00	27.06	33.00	316.2278	0.1011	1.0000	8.00	12.01	8.00	Pass
LTE B41	2498.5	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass

For Bluetooth BLE

Antenna Gain: 3.73 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
2402	2.360478233	-2.94	0.51	0.00024	1	Complies
2440	2.360478233	-4.23	0.38	0.00018	1	Complies
2480	2.360478233	-5.43	0.29	0.00013	1	Complies

For Bluetooth Classic

Antenna Gain: 3.73 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
2402	2.360478233	-2.51	0.56	0.00026	1	Complies
2441	2.360478233	-2.17	0.61	0.00028	1	Complies
2480	2.360478233	-3.33	0.46	0.00022	1	Complies

For 2.4 GHz Wi-Fi

Direction Gain: 6.74 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
11HEW20						
2442	4.720630413	15.95	39.36	0.03696	1	Complies
11HEW40						
2442	4.720630413	15.59	36.22	0.03402	1	Complies

For 5 GHz Wi-Fi

Direction Gain: 8.38 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
11HEW20						
5300	4.720630413	13.97	24.95	0.02343	1	Complies
11HT40						
5510	4.720630413	13.78	23.88	0.02242	1	Complies
11HEW80						
5530	4.720630413	18.08	64.27	0.06036	1	Complies

The NFC, GSM/WCDMA/LTE, Bluetooth and 2.4G/5G Wi-Fi can be transmitted together, the result is 0.225/1+0.1284/0.5495+0.00024/1+0.00028/1+0.03696/1+0.06036/1=0.556507<1,

So SAR report is not required.

Note: Refer to report No. GZCR24100011702 to GZCR24100011706 for EUT test Max Conducted Peak Output Power value.

6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2410001171ME

- End of the Report -

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