TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-5008-1021 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR23-SRF0089-A Page (1) of (8)	eurofins | KCTL

1. Client

- Name : VC Inc.
- Address : 23, Teheran-ro 108-gil, Gangnam-gu, Seoul, Republic of Korea
- Date of Receipt : 2022-12-13

2. Use of Report : Certification

3. Name of Product / Model : Swing Caddie / SC4

4. Manufacturer / Country of Origin : VC Inc. / Korea

5. FCC ID : 2ABTKSC4

7. Date of Test : 2023-02-14 to 2023-02-28

8. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
(Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

9. Test method used : Part 1.1310

10. Test Result : Refer to the test result in the test report

Affirmation	Tested by Name : Minki Kim (Signature)	Technical Manager Name : Heesu Ahn (Signature)

2023-04-07

Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2023-03-31	Originally issued	-
2023-04-07	Updated	4,7

Note. The report No. KR23-SRF0089 is superseded by the report No. KR23-SRF0089-A.

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

CONTENTS

1. General information

Client	:	VC Inc.
Address	:	23, Teheran-ro 108-gil, Gangnam-gu, Seoul, Republic of Korea
Manufacturer	:	VC Inc.
Address	:	23, Teheran-ro 108-gil, Gangnam-gu, Seoul, Republic of Korea
Laboratory	:	Eurofins KCTL Co.,Ltd.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056 CAB Identifier: KR0040 ISED Number: 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Swing Caddie
Model	:	SC4
Modulation technique	:	GFSK (Bluetooth Low Energy) FMCW (24 ㎓ radar sensor)
Number of channels	:	40 ch (Bluetooth Low Energy) 1 ch (24 ㎓ radar sensor)
Power source	:	DC 3.85 V (Battery)
Antenna specification	:	Chip antenna (Bluetooth Low Energy) PCB Array antenna (24 ㎓ radar sensor)
Antenna gain	:	1.8 ㏈i (Bluetooth Low Energy) 8.05 ㏈i (24 ㎓ radar sensor)
Frequency range	:	2 402 ㎒ ~ 2 480 ㎒ (Bluetooth Low Energy) 24 050 ㎒ ~ 24 250 ㎒ (24 ㎓ radar sensor)
Software version	:	1.0
Hardware version	:	1.0
Test device serial No.	:	SC40B23001067
Operation temperature	:	-10 ℃ ~ 50 ℃

2.1. Frequency/channel operations

This device contains the following capabilities:
Bluetooth Low Energy, 24 ㎓ radar sensor

Ch.	Frequency (㎒)
00	2 402
.	.
19	2 440
.	.
39	2 480

Table 2.1.1. Bluetooth Low Energy

Ch.	Frequency (㎒)
0	24 111.9

Table 2.1.2. 24 ㎓ radar sensor

3. Antenna requirement

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.
All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)
Conducted RF power	0.9 ㏈

4. RF Exposure

Regulation

This document is prepared to show compliance with the RF Exposure requirements as required in §1.1310 of the FCC rules and Regulations.
The limit for Maximum Permissible Exposure (MPE), specified in FCC §1.1310, is listed in Table 1-1.
According to FCC §1.1310: the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b).

Table 1 – Limits for Maximum Permissible Exposure (MPE)

Frequency Range (㎒)	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [㎽/㎠]	Averaging Time [minute]
(A) Limits for Occupational / Controlled Exposure				
0.3 ~ 3.0	614	1.63	*100	6
3.0 ~ 30	1842/f	4.89/f	*900/f²	6
30 ~ 300	61.4	0.163	1.0	6
300 ~ 1 500	/	/	f/300	6
1 500 ~ 15 000	/	/	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/f²	30
30 ~ 300	27.5	0.073	0.2	30
300 ~ 1 500	/	/	f/1 500	30
1 500 ~ 15 000	/	/	1.0	30

*f=frequency in ㎒, *= plane-wave equivalent power density*

Per the guidance of KDB 680106, the E-field and H-field limits shown in the table above are extended down to 100 ㎑

MPE (Maximum Permissive Exposure) Prediction

Predication of MPE limit at a given distance: Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2 \quad \left(\Rightarrow R = \sqrt{PG/4\pi S}\right)$$

S = power density [㎽/㎠]
P = Power input to antenna [㎽]
G = Power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna [㎝]

4.1. Test results

Calculation Result of RF exposure

Maximum tune-up tolerance (Worst Case)

Mode	Frequency [㎒]	Max Tune-up Power [dBm]	Max Tune-up Power [㎽]	Ant Gain [dBi]	Ant Gain [㎽]	Power density at 20 ㎝ [㎽/㎠]	Limit [㎽/㎠]
BLE_1M Bits/s	2 402	0.00	1.00	1.80	1.51	0.000 30	1.00

Mode	Frequency [㎒]	Max Tune-up Power [dBm]	Max Tune-up Power [㎽]	Power density at 20 ㎝ [㎽/㎠]	Limit [㎽/㎠]
24 ㎓ radar sensor	24 111.9	10.00	10.00	0.001 99	1.00

EIRP dBm = EIRP dBuV/m@3m − 95.23dB

Note.

1. The power density P_d at a distance of 20 ㎝ calculated from the friis transmission Formula is far below the limit of 1 ㎽/㎠.

Simultaneous transmission

Note: Calculation of MPE ratio with simultaneous transmission for RF exposure test exemption.

Bluetooth LE_GFSK: the ratio is 0.000 30 / 1.000 00
24 ㎓ radar sensor: the ratio is 0.001 99 / 1.000 00
Case 1(Bluetooth LE + 24 ㎓ radar sensor) : (0.000 30 / 1.000 00) + (0.001 99 / 1.000 00) = 0.002 29 ≤ 1.0

Confirm the sum result of individual MPEs ratio is ≤ 1.0;

5. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV40	100989	23.10.14
Horn antenna	ETS.lindgren	3117	155787	23.09.29
AMPLIFIER	B&Z Technologies	BZRT-00504000-481055-382525	26299-27735	23.09.19
Signal Generator	R&S	SMB100A	176206	24.01.19
Power Sensor	R&S	NRP-Z81	1137.9009.02-106224-tg	23.06.23
Attenuator	HP	8491A	18591	24.01.19
Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
Turn Table	Innco Systems	CO3000	1175/45850319/P	-

End of test report