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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-SRF0275 Page (1) of (7)	eurofins KCTL

1. Client

- Name : ITOFROM
- Address : 5F DS Building 8, Dogok-ro 7-gil Gangnam-gu, Seoul,06255, Korea
- Date of Receipt : 2023-08-23

2. Use of Report : Certification

3. Name of Product / Model : Autonomous Sensor(Digital Counter) / NCS23

4. Manufacturer / Country of Origin : ITOFROM / Korea

5. FCC ID : 2BC8U-I2F-NCS23

6. Date of Test : 2023-09-20 to 2023-11-07

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

8. Test method used : Part 1.1310

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

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

2023-12-26

Eurofins KCTL Co.,Ltd.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2023-12-26	Originally issued	-

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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**

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1. General information

Client	:	ITOFROM
Address	:	5F DS Building 8, Dogok-ro 7-gil Gangnam-gu, Seoul,06255, Korea
Manufacturer	:	ITOFROM
Address	:	5F DS Building 8, Dogok-ro 7-gil Gangnam-gu, Seoul,06255, 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 Industry Canada Registration No. : 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Autonomous Sensor(Digital Counter)
Model	:	NCS23
Modulation technique	:	GFSK
Number of channels	:	40 ch
Power source	:	DC 3.6 V
Antenna type	:	Chip antenna
Antenna gain	:	1.24 dBi
Frequency range	:	2 402 MHz ~ 2 480 MHz
Software version	:	V1.0.0
Hardware version	:	PS
Operation temperature	:	-25 ℃ ~ 85 ℃
Test device serial No.	:	Conducted: CSC2329J80005 Radiated: CSC2329J80003

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID
	-	-	-	-	

2.2. Frequency/channel operations

This device contains the following capabilities:
Bluetooth Low Energy

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

Table 2.2.1. Bluetooth Low Energy

3. 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 [㎝]

3.1. Test results

Calculation Result of RF exposure

Maximum tune-up tolerance

Mode	Frequency [㎒]	Max Tune-up Power [dBm]	Max Tune-up Power [㎽]	Ant Gain [dBi]	Power density at 20 ㎝ [㎽/㎠]	Limit [㎽/㎠]
BLE	2 480	4.00	2.51	1.24	0.000 66	1.00

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 ㎽/㎠.

End of test report