



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-SRF0183
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KCTL

1. Client

- Name : HUMAX Co., Ltd
- Address : (Yubang-dong)2, Yeongmun-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
- Date of Receipt : 2023-05-24

2. Use of Report : Certification

3. Name of Product / Model : Client Receiver / C61-500

4. Manufacturer / Country of Origin : HUMAX Co., Ltd / Korea

5. FCC ID : O6ZC61

6. Date of Test : 2023-06-09 to 2023-06-19

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	Technical Manager
	Name : Sehwan Park (Signature)	Name : Seungyong Kim (Signature)

2023-06-20

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.

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REPORT REVISION HISTORY

Date	Revision	Page No
2023-06-20	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 : HUMAX Co., Ltd
 Address : (Yubang-dong)2, Yeongmun-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
 Manufacturer : HUMAX Co., Ltd
 Address : (Yubang-dong)2, Yeongmun-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 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 : Client Receiver
 Model : C61-500
 Modulation technique : DSSS_O-QPSK
 Number of channels : 11 ch
 Power source : DC 12 V
 Antenna specification : PCB Antenna
 Antenna gain : 2.9 dBi(ANT 1), 2.6 dBi(ANT 2),
 Frequency range : 2 425 MHz ~ 2 475 MHz
 Software version : MW 0x193D
 Hardware version : C61-500 HW2.6
 Test device serial No. : Conducted_D61LG3DT11061
 Radiated_D61LG3DT111088
 Operation temperature : 0 °C ~ 40 °C

Note.

The device does not transmit at the same time.

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2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID
AC Adapter	-	EPS10R4-16	DS10C214 3N6322	Input : 120 V ~ 0.5 A Output : 12 V / 1.5 A	-

2.2. Frequency/channel operations

This device contains the following capabilities:
Zigbee

Ch.	Frequency (MHz)
15	2 425
⋮	⋮
20	2 450
⋮	⋮
25	2 475

Table 2.2.1. Zigbee mode

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 (MHz)	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm ²]	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/f ²	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/f ²	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 MHz, *= 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 kHz

MPE (Maximum Permissive Exposure) Prediction

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

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

S = power density [mW/cm²]

P = Power input to antenna [mW]

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 [cm]

3.1. Test results

Calculation Result of RF exposure

Maximum tune-up tolerance

Mode	Frequency [MHz]	Max Tune-up Power [dBm]	Max Tune-up Power [mW]	Ant Gain [dBi]	Power density at 20 cm [mW/cm ²]	Limit [mW/cm ²]
Zigbee_ANT1	2 425	7.00	5.01	2.90	0.001 94	1.00
Zigbee_ANT2	2 425	8.00	6.31	2.60	0.002 28	1.00

Note.

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

End of test report