TEST REPORT

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KCTL

1. Client

- Name : CPRO Electronics Co., Ltd.
- Address : (Sangdaiwon-Dong, 4,5FL) 214, Galmachi-ro Jungwon-gu, Seongnam-si, Gyeonggi-do, KOREA
- Date of Receipt : 2020-08-31

2. Use of Report : Certification

3. Name of Product / Model : 2.4GHz WIFI IP CAMERA / NST8-22-R

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

5. FCC ID : 2AX2S-NST8-22-R

6. Date of Test : 2020-10-15 to 2020-10-27

7. Location of Test : ■ Permanent Testing Lab □ On Site Testing (Address: Address of testing location)

8. Test method used : 47 CFR Part 1.1310

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

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

2020-11-03

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2020-11-03	Originally issued	-

General remarks for test reports

Nothing significant to report.

CONTENTS

1. General information

Client	:	CPRO Electronics Co., Ltd.
Address	:	(Sangdaiwon-Dong, 4,5FL) 214, Galmachi-ro Jungwon-gu, Seongnam-si, Gyeonggi-do, KOREA
Manufacturer	:	CPRO Electronics Co., Ltd.
Address	:	(Sangdaiwon-Dong, 4,5FL) 214, Galmachi-ro Jungwon-gu, Seongnam-si, Gyeonggi-do, KOREA
Laboratory	:	KCTL Inc.
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	:	2.4GHz WIFI IP CAMERA
Model	:	NST8-22-R
Derivative model	:	VX-2M-CPIR-IAW, SN-2M-CPIR-IAW
Frequency range	:	2 412 ㎒ ~ 2 462 ㎒ (WIFI(802.11b/g/n_HT20))
		2 422 ㎒ ~ 2 452 ㎒ (WIFI(802.11n_HT40))
Modulation technique	:	WIFI(802.11b/g/ n_HT20/HT40)_DSSS, OFDM
Number of channels	:	WIFI(802.11b/g/n_HT20)_11 ch
		WIFI(802.11n_HT40)_9 ch
Power source	:	DC 12 ㅿ, PoE 48 ㅿ
Antenna specification	:	PCB Mounted Embedded Antenna
Antenna gain	:	2.4 ㏈i
Software version	:	A7.2.1
Hardware version	:	R1
Operation temperature	:	-20 ℃ ~ 50 ℃

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
Adapter	LITEON	PA-1061-0	N/A	Input: 100-240 ㅿ, 50/60㎐ 1.5 A Output: 12 ㅿ /5 A
POE	ZHONGSHAN XIAOLAN HUI YANG ELECTRIC APPLIANCE FACTORY	HS36-4800500KA	N/A	Input: 100-240 ㅿ, 50/60 ㎐ 0.6 A Output: 48 ㅿ /0.5 A

2.2. Information about derivative model

The difference between basic model and derivative models is:

VX-2M-CPIR-IAW, SN-2M-CPIR-IAW: NST8-22-R with customer's mark & label
Each models are the same functionality.

2.3. Frequency/channel operations

This device contains the following capabilities:
WLAN 2.4 ㎓(802.11b/g/n_HT20/HT40)

Ch.	Frequency (㎒)
01	2 412
.	.
.	.
06	2 437
.	.
.	.
11	2 462

Table 2.3.1. 802.11b/g/n(HT20) mode

Ch.	Frequency (㎒)
03	2 422
.	.
.	.
06	2 437
.	.
.	.
09	2 452

Table 2.3.2. 802.11n(HT40) mode

3. Measurement uncertainty

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	1.76 dB

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/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 ㎒, *= 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 ㎑

4.1. Test results

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 [㎝]

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 [㎽/㎠]
802.11b	2 412	5.0	3.16	2.4	0.00109	1.000 00

Note.

1. The power density P_d (5th column) at a distance of 20 ㎝ calculated from the friis transmission Formula is far below the limit of 1 ㎽/㎠.

End of test report