



RF EXPOSURE Test Report

Report No.: MTi220114004-04E3

Date of issue: 2022-08-19

Applicant: INSTAR Deutschland GmbH

Product name: IP / NETWORK CAMERA

Model(s): IN-9408 2K+, IN-9406 2K+, IN-9409 2K+,
IN-9016 2K+

FCC ID: SO6-IN9408

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



TEST RESULT CERTIFICATION	
Applicant's name	INSTAR Deutschland GmbH
Address	Auf Der Hostert 17, 65510 Hünstetten Bechtheim, Germany
Manufacturer's Name	INSTAR Deutschland GmbH
Address	Auf Der Hostert 17, 65510 Hünstetten Bechtheim, Germany
Product description	
Product name	IP / NETWORK CAMERA
Trademark	INSTAR
Model Name	IN-9408 2K+
Serial Model	IN-9406 2K+, IN-9409 2K+, IN-9016 2K+
Standards	N/A
Test procedure	KDB 447498 D01 v06
Date of Test	
Date (s) of performance of tests	2022-07-26 ~ 2022-08-19
Test Result	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.	

Testing Engineer

:

Cindy Qin

(Cindy Qin)

Technical Manager

:

Leon Chen

(Leon Chen)

Authorized Signatory

:

Tom Xue

(Tom Xue)



RF EXPOSURE EVALUATION

According to FCC 1.1310: 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 §1.1307(b)

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 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
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.



Measurement Result

2.4GWiFi:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

802.11n HT40: 2422-2452MHz,

Power density limited: 1mW/ cm²

Antenna Type: External Antenna;

WIFI antenna gain: 3.5dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3.5/10)}=2.24$

5GWiFi:

802.11a: 20 MHz

802.11n: 20 MHz, 40 MHz

802.11ac: 20 MHz, 40 MHz, 80MHz

Antenna Type: External Antenna;

WIFI antenna gain:

U-NII-1: 2.52dBi

U-NII-3: 1.9dBi

R=20cm

$mW=10^{(dBm/10)}$

U-NII-1: antenna gain Numeric= $10^{(dBi/10)}=10^{(2.52/10)}=1.79$

U-NII-3: antenna gain Numeric= $10^{(dBi/10)}=10^{(1.9/10)}=1.55$



2.4GWiFi:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
2412	802.11b	15.4	16±1	17	50.119	2.24	0.02233	1
2437		16.07	16±1	17	50.119	2.24	0.02233	1
2462		16.13	16±1	17	50.119	2.24	0.02233	1
2412	802.11g	9.05	10±1	11	12.589	2.24	0.00561	1
2437		13.59	14±1	15	31.623	2.24	0.01409	1
2462		14.09	14±1	15	31.623	2.24	0.01409	1
2412	802.11n H20	14.83	14±1	15	31.623	2.24	0.01409	1
2437		13.26	14±1	15	31.623	2.24	0.01409	1
2462		13.33	14±1	15	31.623	2.24	0.01409	1
2422	802.11n H40	13.09	14±1	15	31.623	2.24	0.01409	1
2437		12.66	13±1	14	25.119	2.24	0.01119	1
2452		13.25	14±1	15	31.623	2.24	0.01409	1

5GWiFi:

UNII-1

Frequency (MHz)	Modulation mode	conduct ed power	Tune-up powe r	Max		Anten na	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numer ic		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
5180	11a	15.99	15±1	16	39.811	1.79	0.01418	1
5200	11a	17.38	17±1	18	63.096	1.79	0.02247	1
5240	11a	15.76	15±1	16	39.811	1.79	0.01418	1
5180	11n (HT20)	15.69	15±1	16	39.811	1.79	0.01418	1
5200	11n (HT20)	14.95	15±1	16	39.811	1.79	0.01418	1
5240	11n (HT20)	14.48	15±1	16	39.811	1.79	0.01418	1
5190	11n (HT40)	14.12	15±1	16	39.811	1.79	0.01418	1
5230	11n (HT40)	14.1	15±1	16	39.811	1.79	0.01418	1
5180	11ac (HT20)	12.56	13±1	14	25.119	1.79	0.00895	1
5200	11ac (HT20)	12.55	13±1	14	25.119	1.79	0.00895	1
5240	11ac (HT20)	12.46	13±1	14	25.119	1.79	0.00895	1
5190	11ac (HT40)	12.11	13±1	14	25.119	1.79	0.00895	1
5230	11ac (HT40)	12.15	13±1	14	25.119	1.79	0.00895	1
5210	11ac (HT80)	13.04	13±1	14	25.119	1.79	0.00895	1



UNII-3

Frequency (MHz)	Modulation mode	conduct ed power	Tune- up powe r	Max		Anten na	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm2)	(mW/cm2)
		Ant A	Ant A	(dBm)	(mW)	Numer ic		
				Ant A	Ant A	Ant A	Ant A	
5745	11a	15.84	15±1	16	39.811	1.55	0.01228	1
5785	11a	16.02	16±1	17	50.119	1.55	0.01545	1
5825	11a	16.49	16±1	17	50.119	1.55	0.01545	1
5745	11n (HT20)	14.35	15±1	16	39.811	1.55	0.01228	1
5785	11n (HT20)	15.01	15±1	16	39.811	1.55	0.01228	1
5825	11n (HT20)	15.26	15±1	16	39.811	1.55	0.01228	1
5755	11n (HT40)	14.52	15±1	16	39.811	1.55	0.01228	1
5795	11n (HT40)	14.8	15±1	16	39.811	1.55	0.01228	1
5745	11ac (HT20)	11.89	11±1	12	15.849	1.55	0.00489	1
5785	11ac (HT20)	13.01	13±1	14	25.119	1.55	0.00775	1
5825	11ac (HT20)	13.19	13±1	14	25.119	1.55	0.00775	1
5755	11ac (HT40)	12.23	13±1	14	25.119	1.55	0.00775	1
5795	11ac (HT40)	12.38	13±1	14	25.119	1.55	0.00775	1
5775	11ac (HT80)	14.02	14±1	15	31.623	1.55	0.00975	1

Conclusion:

For the max result: $0.02247 \leq 1.0$ SAR, No SAR is required.

----END OF REPORT----