



RF EXPOSURE Test Report

Report No.: MTi230620016-05E3

Date of issue: 2024-09-05

Applicant: INSTAR Deutschland GmbH

Product: IP / NETWORK CAMERA

Model(s): IN-8401 2K+, IN-8402 2K+

FCC ID: SO6-IN8401

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.cn>



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Test Result Certification	
Applicant:	INSTAR Deutschland GmbH
Address:	Auf der Hostert 17, 65510 Hünstetten, Germany
Manufacturer:	INSTAR Deutschland GmbH
Address:	Auf der Hostert 17, 65510 Hünstetten, Germany
Product description	
Product name:	IP / NETWORK CAMERA
Trademark:	INSTAR
Model name:	IN-8401 2K+
Serial Model:	IN-8402 2K+
Standards:	part 2.1091
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-01-04 to 2023-01-08 2024-07-01 to 2024-07-04
Test result:	Pass

Test Engineer :

Letter. Lan.

(Letter Lan)

Reviewed By :

David. Lee

(David Lee)

Approved By :

Leon Chen

(Leon Chen)



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

2.4G WIFI:

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

ANT Gain: 3.07dBi

Power density limited: 1mW/ cm²

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/cm2)	(mW/cm2)
				(dBm)	(mW)	Numeric		
2412	802.11b	16.25	16±1	17	50.119	2.03	0.02022	1
2437		16.59	16±1	17	50.119	2.03	0.02022	1
2462		15.97	15±1	16	39.811	2.03	0.01606	1
2412	802.11g	15.23	15±1	16	39.811	2.03	0.01606	1
2437		15.54	15±1	16	39.811	2.03	0.01606	1
2462		15.29	15±1	16	39.811	2.03	0.01606	1
2412	802.11n H20	12.87	12±1	13	19.953	2.03	0.00805	1
2437		12.96	12±1	13	19.953	2.03	0.00805	1
2462		12.61	12±1	13	19.953	2.03	0.00805	1
2422	802.11n H40	12.58	12±1	13	19.953	2.03	0.00805	1
2437		13.13	13±1	14	25.119	2.03	0.01013	1
2452		12.63	12±1	13	19.953	2.03	0.00805	1

802.11a/n(HT20):

U-NII Band 1: 5180MHz to 5240MHz;

U-NII Band 3: 5745MHz to 5825MHz;

802.11n/ac (HT40):

U-NII Band 1: 5190MHz to 5230MHz;

U-NII Band 3: 5755MHz to 5795MHz;

802.11ac (HT80):

U-NII Band 1: 5210MHz;

U-NII Band 3: 5775MHz;

ANT Gain: U-NII-1: 1.17dBi, U-NII-3: 2.30dBi;

Power density limited: 1mW/ cm²

U-NII-1

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)	Numerical		
5180	11a	15.53	15±1	16	39.811	1.31	0.01037	1
5200	11a	15.47	15±1	16	39.811	1.31	0.01037	1
5240	11a	15.72	15±1	16	39.811	1.31	0.01037	1
5180	11n (HT20)	14.67	14±1	15	31.623	1.31	0.00824	1
5200	11n (HT20)	14.56	14±1	15	31.623	1.31	0.00824	1
5240	11n (HT20)	14.79	14±1	15	31.623	1.31	0.00824	1
5190	11n (HT40)	14.32	14±1	15	31.623	1.31	0.00824	1
5230	11n (HT40)	14.07	14±1	15	31.623	1.31	0.00824	1
5180	11ac (HT20)	12.48	12±1	13	19.953	1.31	0.00520	1
5200	11ac (HT20)	12.68	12±1	13	19.953	1.31	0.00520	1
5240	11ac (HT20)	11.65	11±1	12	15.849	1.31	0.00413	1
5190	11ac (HT40)	11.16	11±1	12	15.849	1.31	0.00413	1
5230	11ac (HT40)	12.52	12±1	13	19.953	1.31	0.00520	1
5210	11ac (HT80)	12.41	12±1	13	19.953	1.31	0.00520	1



U-NII-3

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power (dBm)	(mW)	Gain Numeric	Power density(mW/cm ²)	(mW/cm ²)
5745	11a	15.39	15±1	16	39.811	1.70	0.01345	1
5785	11a	15.10	15±1	16	39.811	1.70	0.01345	1
5825	11a	15.24	15±1	16	39.811	1.70	0.01345	1
5745	11n (HT20)	13.41	13±1	14	25.119	1.70	0.00849	1
5785	11n (HT20)	14.34	14±1	15	31.623	1.70	0.01068	1
5825	11n (HT20)	13.32	13±1	14	25.119	1.70	0.00849	1
5755	11n (HT40)	14.07	14±1	15	31.623	1.70	0.01068	1
5795	11n (HT40)	14.26	14±1	15	31.623	1.70	0.01068	1
5745	11ac (HT20)	12.13	12±1	13	19.953	1.70	0.00674	1
5785	11ac (HT20)	12.58	12±1	13	19.953	1.70	0.00674	1
5825	11ac (HT20)	12.22	12±1	13	19.953	1.70	0.00674	1
5755	11ac (HT40)	11.70	11±1	11	12.589	1.70	0.00425	1
5795	11ac (HT40)	11.33	11±1	12	15.849	1.70	0.00535	1
5775	11ac (HT80)	10.93	10±1	11	12.589	1.70	0.00425	1

Conclusion:

For the max result: $0.02022 \leq 1.0$, No SAR is required.

----END OF REPORT----