Maximum Permissible Exposure Evaluation

FCC ID: 2AKURJF-CAM

1. Client Information

Applicant	:	Hangzhou Jufeng Technology Co., Ltd.
Address	:	Building 9, Yinhu Innovation Center, No.9 FuXian Road, YinHu Street, Hangzhou, Zhejiang, China
Manufacturer	:	Hangzhou Jufeng Technology Co., Ltd.
Address	:	Building 9, Yinhu Innovation Center, No.9 FuXian Road, YinHu Street, Hangzhou, Zhejiang, China

2. General Description of EUT

EUT Name	:	WIFI NVR KIT
Models No.	:	JF-IPC-ED2110-IR2-WS , JF-IPC-EM2wxx-IR8-WS, JF-IPC-EM4wxx-IR8-WS, JF-IPC-EM2wxx-IR8-WA, JF-IPC-EM4wxx-IR8-WA, JF-IPC-EM2wxx-IR8-WP, JF-IPC-EM4wxx-IR8-WP, JF-IPC-ED2wxx-IR2-WS, JF-IPC-ED4wxx-IR2-WS, JF-IPC-ED2wxx-IR2-WA, JF-IPC-ED4wxx-IR2-WA, JF-IPC-ED2wxx-IR2-WP, JF-IPC-ED4wxx-IR2-WP, JF-IPC-BM2wxx-IR2-WS, JF-IPC-BM4wxx-IR2-WS, JF-IPC-BM2wxx-IR2-WA, JF-IPC-BM4wxx-IR2-WA, JF-IPC-BM2wxx-IR2-WP, JF-IPC-BM4wxx-IR2-WP, JF-IPC-HE2wxx-IR2-WS, JF-IPC-HE4wxx-IR2-WS, JF-IPC-HE2wxx-IR2-WA , JF-IPC-HE4wxx-IR2-WA, JF-IPC-HE2wxx-IR2-WP, JF-IPC-HE4wxx-IR2-WP, JF-IPC-EQ2wxx-IR2-WS, JF-IPC-EQ4wxx-IR2-WS, JF-IPC-EQ2wxx-IR2-WA, JF-IPC-EQ4wxx-IR2-WA, JF-IPC-EQ2wxx-IR2-WP, JF-IPC-EQ4wxx-IR2-WP, JF-IPC-BS2wxx-IR2-WS, JF-IPC-BS4wxx-IR2-WS, JF-IPC-BS2wxx-IR2-WA, JF-IPC-BS4wxx-IR2-WA, JF-IPC-BS2wxx-IR2-WP, JF-IPC-BS4wxx-IR2-WP, JF-IPC-HS2wxx-IR2-WS, JF-IPC-HS4wxx-IR2-WS, JF-IPC-HS2wxx-IR2-WA, JF-IPC-HS4wxx-IR2-WA, JF-IPC-HS2wxx-IR2-WP, JF-IPC-HS4wxx-IR2-WP, JF-IPC-FC2wxx-IR2-WS, JF-IPC-FC4wxx-IR2-WS, JF-IPC-FC2wxx-IR2-WA, JF-IPC-FC4wxx-IR2-WA, JF-IPC-FC2wxx-IR2-WP, JF-IPC-FC4wxx-IR2-WP The"w"can be 1、2、3、4 denote different market positioning. The"xx"can be 10、13、20、30 denote different software configuration.
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is market positioning and software configuration.

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Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
		Number of Channel:	802.11b/g/n(HT20):11 channels **see note(3)** 802.11n(HT40):9 channels **see note(3)**
		RF Output Power:	802.11b: 18.77 dBm 802.11g: 16.94 dBm 802.11n (HT20): 15.43 dBm 802.11n (HT40): 15.08 dBm
		Antenna Gain:	5 dBi Dipole Antenna
		Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n:OFDM(BPSK,QPSK,16QAM, 64QAM)
		Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	DC power by AC/DC Adapter.	
Power Rating	:	Input: AC 100~240V,50/60Hz, 0.4A. Output: DC 12.0V, 1A.	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

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MPE Calculations for WiFi

1. Antenna Gain:

Dipole Antenna: 5 dBi.

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density
P: power input to the 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

4. Test Result:

Worst Maximum MPE Result								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm^2) [S]
802.11b	1	2412	18.44	18±1	19	5	20	0.050
		2437	18.77	18±1	19	5	20	0.050
		2462	18.40	18±1	19	5	20	0.050
802.11g	1	2412	16.07	16±1	17	5	20	0.032
		2437	16.55	16±1	17	5	20	0.032
		2462	16.94	16±1	17	5	20	0.032
802.11n (HT20)	1	2412	15.06	15±1	16	5	20	0.025
		2437	15.43	15±1	16	5	20	0.025
		2462	15.16	15±1	16	5	20	0.025
802.11n (HT40)	1	2422	14.78	15±1	16	5	20	0.025
		2437	15.08	15±1	16	5	20	0.025
		2452	14.53	15±1	16	5	20	0.025

Note:
(1) N_{TX}= Number of Transmit Antennas
(2) RF Output power specifies that Maximum Conducted Peak Output Power.

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/cm^2)
300-1,500	F/1500
1,500-100,000	1.0

For 802.11b/g/n (2412~2462 MHz)
MPE limit S: 1 mW/cm^2
The MPE is calculated as 0.050mW/cm^2 < limit 1 mW/cm^2. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

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