Maximum Permissible Exposure Evaluation

FCC ID: 2APRB-WNVR-WNIP2

1. Client Information

Applicant	:	Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Address	:	No.2 Plant ,West of Shanxi country , Dashi street, Panyu District, Guangzhou City, China
Manufacturer	:	Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Address	:	No.2 Plant ,West of Shanxi country , Dashi street, Panyu District, Guangzhou City, China

2. General Description of EUT

EUT Name	:	Wireless Network Video Recorder	
Models No.	:	WNVR-WNIP2, WNIP2-4L1, CL-2WNP1-2L, CL-2WNP1-4L, CL-2WNP1-8L, WNIP21L-2-B, WNIP21L-4-B, WNIP21L-8-B	
Brand Name	:	NIGHT OWL	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
Power Rating	:	Adapter(CS-1202000): Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12V, 2A	
Software Version	:	WNVR-WNIP2_20200420	
Hardware Version	:	Hi3536D_V125P	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

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MPE Calculations

1. Antenna Gain:

Antenna	Brand	Type	2.4G Antenna Gain(dBi)
ANT. A	N/A	External Ant	5.0
ANT. B	N/A	External Ant	5.0

Note:
For MIMO mode: Directional Gain=ANT. Gain+10*LOG(N_{ANT}) =8.01dBi
2.4G working with 802.11b/g/n(HT20/HT40) has MIMO mode.

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. Simultaneous transmission MPE Considerations

According to KDB447498 :All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1.Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.

This means that:

∑ of MPE ratios ≤ 1.0

5. Standalone MPE Evaluation:

[2.4GHz WLAN]

Mode	Channel	Frequency	Peak Conducted Output Power (dBm)		Tolerance ± (dB)	Turn-up Power Tolerance (dB)	
			Ant.A	Ant.B		Ant.A	Ant.B
IEEE 802.11b	1	2412	14.827	15.665	1.0	15±1	15±1
	6	2437	15.152	14.696	1.0	15±1	15±1
	11	2462	15.248	15.474	1.0	15±1	15±1
IEEE 802.11g	1	2412	14.904	15.531	1.0	15±1	15±1
	6	2437	14.940	15.756	1.0	15±1	15±1
	11	2462	14.428	15.153	1.0	15±1	15±1
IEEE 802.11n HT20	1	2412	14.915	15.570	1.0	15±1	15±1
	6	2437	14.562	15.360	1.0	15±1	15±1
	11	2462	15.065	14.624	1.0	15±1	15±1
IEEE 802.11n HT40	3	2422	15.304	15.204	1.0	15±1	15±1
	6	2437	15.157	15.112	1.0	15±1	15±1
	9	2452	14.836	14.635	1.0	15±1	15±1

2.4GHz WLAN ANT. A

Modulation Type	Output power (Turn-up Procedure)		Antenna Gain (dBi)	Antenna Gain (Numeric)	Distance (cm) [R]	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW					
IEEE 802.11b	15.248	33.48	5.0	3.162	25	0.0210	1.0000
IEEE 802.11g	14.940	31.19	5.0	3.162	25	0.0196	1.0000
IEEE 802.11n HT20	15.065	32.10	5.0	3.162	25	0.0201	1.0000
IEEE 802.11n HT40	15.304	33.91	5.0	3.162	25	0.0213	1.0000

2.4GHz WLAN ANT. B

Modulation Type	Output power (Turn-up Procedure)		Antenna Gain (dBi)	Antenna Gain (Numeric)	Distance (cm) [R]	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW					
IEEE 802.11b	15.665	36.85	5.0	3.162	25	0.0231	1.0000
IEEE 802.11g	15.756	37.63	5.0	3.162	25	0.0236	1.0000
IEEE 802.11n HT20	15.570	36.05	5.0	3.162	25	0.0226	1.0000
IEEE 802.11n HT40	15.204	33.14	5.0	3.162	25	0.0208	1.0000

Remark:
1. Output power (Average) including turn-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 25cm from user manual provide by manufacturer.

6. Summary simultaneous transmission information

Modulation Type	Work Frequency Band	Transmit Antenna		Antenna A Antenna B Synchronization transmit
		Antenna A	Antenna B	
IEEE 802.11b	2.4GHz	Yes	Yes	Yes
IEEE 802.11g	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT20	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT40	2.4GHz	Yes	Yes	Yes

7. Summary simultaneous transmission results

Antenna A and Antenna B for 2.4GWLAN

Modulation Type	MPE $_{Antenna\ A}$ (mW/cm^2)	MPE $_{Antenna\ B}$ (mW/cm^2)	∑MPE ratios	Limit	Results
IEEE 802.11b	0.0210	0.0231	0.0441	1.0	PASS
IEEE 802.11g	0.0196	0.0236	0.0432	1.0	PASS
IEEE 802.11n HT20	0.0201	0.0226	0.0427	1.0	PASS
IEEE 802.11n HT40	0.0213	0.0208	0.0421	1.0	PASS

Maximum Simultaneous transmission MPE Ratios for 2.4GHz WLAN

Maximum MPE ratio 2.4GWLAN	Limit	Results
0.0441	1.0	PASS

8. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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