Maximum Permissible Exposure Evaluation

FCC ID: 2APRB-WNVR-BTWN8

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-BTWN8, WNVR-BTWN8-1, WNVR-BTWN8-1-CN4, WNVR-BTWN8-2-CN4, BTWN8-4L1, BTWN8-8L1, WNVR-BTWN8-1-WA-CN4, CL-BT8WN-14L, CL-BT8WN-18L	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is model name.	
Brand Name	:	NIGHT OWL	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz Bluetooth 4.2(BLE): 2402MHz~2480MHz
Power Rating	:	Adapter: CS-1202000 Input:100-240~1.5A Max. 50/60Hz Output:12V2A	
Software Version	:	WNVR-BTWN8-10_20210430	
Hardware Version	:	MC6630_V140_NVR0408	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the MPE report used the EUT-2(20210416-03-2#).	

1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Tel: +86 75526509301 Fax: +86 75526509195

MPE Calculations

1. Antenna Gain:

Antenna	Brand	Model Name	Type	2.4G Antenna Gain(dBi)
ANT. A	N/A	N/A	Dipole	5
ANT. B	N/A	N/A	Dipole	5
Note: **For MIMO mode: Directional Gain=ANT. Gain+10*LOG(N_{ANT}) =8.01 dBi** **2.4G working with 802.11b/g/n(HT20/HT40) has MIMO mode.**				

Antenna	Brand	Model Name	Type	BLE Antenna Gain(dBi)
/	N/A	N/A	PCB	2.0

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	16.593	15.238	1.0	16±1	15±1
	6	2437	15.803	14.119	1.0	15±1	14±1
	11	2462	16.404	15.603	1.0	16±1	15±1
IEEE 802.11g	1	2412	14.056	13.125	1.0	14±1	13±1
	6	2437	14.073	13.166	1.0	14±1	13±1
	11	2462	13.693	12.877	1.0	13±1	12±1
IEEE 802.11n HT20	1	2412	12.497	12.979	1.0	12±1	12±1
	6	2437	12.837	12.908	1.0	12±1	12±1
	11	2462	13.14	12.446	1.0	13±1	12±1
IEEE 802.11n HT40	3	2422	12.651	11.435	1.0	12±1	11±1
	6	2437	12.298	12.014	1.0	12±1	12±1
	9	2452	12.048	12.037	1.0	12±1	12±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	17	50.119	5	3.162	20	0.0315	1.0000
IEEE 802.11g	15	31.623	5	3.162	20	0.0199	1.0000
IEEE 802.11n HT20	14	25.119	5	3.162	20	0.0158	1.0000
IEEE 802.11n HT40	13	19.953	5	3.162	20	0.0126	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	16	39.811	5	3.162	20	0.0250	1.0000
IEEE 802.11g	14	25.119	5	3.162	20	0.0158	1.0000
IEEE 802.11n HT20	13	19.953	5	3.162	20	0.0126	1.0000
IEEE 802.11n HT40	13	19.953	5	3.162	20	0.0126	1.0000

BLE

Modulation Type BLE	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					
2402	3.801	2.399	2.0	1.585	20	0.0007	1.0000
2442	3.654	2.320	2.0	1.585	20	0.0007	1.0000
2480	2.581	1.812	2.0	1.585	20	0.0005	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 20cm 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

Modulation Type	Work Frequency Band	Transmit Antenna	Antenna PCB Synchronization transmit
		Antenna PCB	
BLE	2.4GHz	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	0.0315	0.0250	0.0565	1.0	PASS
IEEE 802.11g	0.0199	0.0158	0.0357	1.0	PASS
IEEE 802.11n HT20	0.0158	0.0126	0.0284	1.0	PASS
IEEE 802.11n HT40	0.0126	0.0126	0.0252	1.0	PASS

BLE

Modulation Type BLE	MPE (mW/cm^2)	∑MPE ratios	Limit	Results
2402	0.0007	0.0007	1.0	PASS
2442	0.0007	0.0007	1.0	PASS
2480	0.0005	0.0005	1.0	PASS

BLE and 2.4G Wifi Maximum Simultaneous transmission MPE Ratios is 0.0315+0.0250+0.0007=0.0572≤ 1.0.

8. Conclusion:

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

-----END OF REPORT-----