

Maximum Permissible Exposure Report

1 PRODUCT INFORMATION

EUT	: IP Phone
Model Number	: H601W, i501W
Model Declaration	: All the same except for the model name, appearance color and appearance keys.
Test Model	: H601W
Power Supply	: DC 5V from adapter
Hardware version	: V1.0
Software version	: 2.12.20.4

2 EVALUATION METHOD

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for 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 modelled or measured field strengths or power density, is ≤ 1.0 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3 LIMIT

3.1 Refer evaluation method

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

3.2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

4 MPE CALCULATION METHOD

Predication of MPE limit at a given distance

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 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

5 ANTENNA INFORMATION

Antenna Gain and type refer to Antenna specification

6 CONDUCTED POWER

WiFi 2.4GHz Band

TestMode	Antenna	Channel	Result[dBm]
802.11b	Ant1	2412	13.22
	Ant1	2437	12.88
	Ant1	2462	12.92
802.11g	Ant1	2412	12.97
	Ant1	2437	12.84
	Ant1	2462	12.79
802.11n20	Ant1	2412	13.00
	Ant1	2437	13.20
	Ant1	2462	12.70
802.11n40	Ant1	2422	11.78
	Ant1	2437	11.73
	Ant1	2452	11.57
802.11ax20	Ant1	2412	11.88
	Ant1	2437	11.62
	Ant1	2462	11.61
802.11ax40	Ant1	2422	11.77
	Ant1	2437	11.64
	Ant1	2452	11.59

5G Band
UNII-1 Band

Test Mode	Antenna	Channel	Result[dBm]
802.11a	Ant1	5180	12.89
	Ant1	5200	13.59
	Ant1	5240	13.75
802.11n20	Ant1	5180	12.26
	Ant1	5200	12.43
	Ant1	5240	13.17
802.11n40	Ant1	5190	12.41
	Ant1	5230	12.68
802.11ac20	Ant1	5180	12.17
	Ant1	5200	12.87
	Ant1	5240	13.02
802.11ac40	Ant1	5190	12.35
	Ant1	5230	13.08
802.11ac80	Ant1	5210	12.49
802.11ax20	5180	5180	12.69
	5200	5200	12.73
	5240	5240	13.15
802.11ax40	5190	5190	12.93
	5230	5230	13.03
802.11ax80	5210	5210	13.14

UNII-2A Band

Test Mode	Antenna	Channel	Result[dBm]
802.11a	Ant1	5260	13.85
	Ant1	5300	13.73
	Ant1	5320	13.36
802.11n20	Ant1	5260	13.05
	Ant1	5300	12.83
	Ant1	5320	12.84
802.11n40	Ant1	5270	12.82
	Ant1	5310	12.43
802.11ac20	Ant1	5260	12.93
	Ant1	5300	12.36
	Ant1	5320	12.76
802.11ac40	Ant1	5270	12.50
	Ant1	5310	12.98
802.11ac80	Ant1	5290	12.74
802.11ax20	5180	5260	12.47
	5200	5300	12.73
	5240	5320	12.77
802.11ax40	5190	5270	12.55
	5230	5310	12.48
802.11ax80	5210	5290	13.01

UNII-2C Band

Test Mode	Antenna	Channel	Result[dBm]
802.11a	Ant1	5500	13.11
	Ant1	5580	12.29
	Ant1	5700	12.52
802.11n20	Ant1	5500	11.03
	Ant1	5580	11.47
	Ant1	5700	11.45
802.11n40	Ant1	5510	11.19
	Ant1	5590	11.70
	Ant1	5670	11.35
802.11ac20	Ant1	5500	12.00
	Ant1	5580	11.84
	Ant1	5700	11.48
802.11ac40	Ant1	5510	11.03
	Ant1	5590	11.82
	Ant1	5670	11.37
802.11ac80	Ant1	5530	11.87
	Ant1	5610	11.62
802.11ax20	Ant1	5500	11.11
	Ant1	5580	12.07
	Ant1	5700	11.51
802.11ax40	Ant1	5510	12.09
	Ant1	5590	11.89
	Ant1	5670	11.03
802.11ax80	Ant1	5530	11.04
	Ant1	5610	11.47

UNII-3 Band

Test Mode	Antenna	Channel	Result[dBm]
802.11a	Ant1	5745	13.71
	Ant1	5785	12.94
	Ant1	5825	11.57
802.11n20	Ant1	5745	12.49
	Ant1	5785	12.05
	Ant1	5825	10.96
802.11n40	Ant1	5755	12.80
	Ant1	5795	12.13
802.11ac20	Ant1	5745	13.21
	Ant1	5785	11.91
	Ant1	5825	11.31
802.11ac40	Ant1	5755	12.72
	Ant1	5795	12.02
802.11ac80	Ant1	5775	12.83
802.11ax20	Ant1	5745	12.73
	Ant1	5785	12.28
	Ant1	5825	11.39
802.11ax40	Ant1	5755	13.04
	Ant1	5795	12.19
802.11ax80	Ant1	5775	12.50

7 MANUFACTURING TOLERANCE

WiFi 2.4GHz Band

IEEE 802.11b(Average)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12.5	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11g(Average)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12.0	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT20(Average)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	12.0	12.5	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT40(Average)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ax HE20(Average)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ax HE40(Average)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0

UNII-1 Band

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	12.0	13.0	13.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	12.0	12.0	13.5
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	12.0	12.0	12.5
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11axVHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	12.0	12.0	12.5
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 38	Channel 46	--
Target (dBm)	12.0	12.0	--
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 38	Channel 46	--
Target (dBm)	11.5	12.5	--
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ax VHT40 (Average)			
Channel	Channel 38	Channel 46	
Target (dBm)	12.0	12.5	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 42	--	--
Target (dBm)	11.5	--	--
Tolerance $\pm$ (dB)	1.0	--	--
IEEE 802.11ax VHT80 (Average)			
Channel	Channel 42		
Target (dBm)	12.5		
Tolerance $\pm$ (dB)	1.0		

UNII-2A Band

IEEE 802.11a (Average)			
Channel	Channel 52	Channel 60	Channel 64
Target (dBm)	13.0	13.0	13.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 52	Channel 60	Channel 64
Target (dBm)	12.5	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 52	Channel 60	Channel 64
Target (dBm)	12.0	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ax HE20 (Average)			
Channel	Channel 52	Channel 60	Channel 64
Target (dBm)	12.0	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 54	Channel 62	--
Target (dBm)	12.0	12.0	
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 54	Channel 62	--
Target (dBm)	12.0	12.0	
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ax HE40 (Average)			
Channel	Channel 54	Channel 62	
Target (dBm)	12.0	12.0	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 58	--	--
Target (dBm)	12.0	--	--
Tolerance $\pm$ (dB)	1.0	--	--
IEEE 802.11ax HE80 (Average)			
Channel	Channel 58	--	--
Target (dBm)	12.5	--	--
Tolerance $\pm$ (dB)	1.0	--	--

UNII-2C Band

IEEE 802.11a (Average)			
Channel	Channel 100	Channel 116	Channel 140
Target (dBm)	12.5	12.0	12.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 100	Channel 116	Channel 140
Target (dBm)	10.5	10.5	10.5
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 100	Channel 116	Channel 140
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11axVHT20 (Average)			
Channel	Channel 100	Channel 116	Channel 140
Target (dBm)	10.5	11.5	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 106	Channel 110	Channel 134
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 106	Channel 110	Channel 134
Target (dBm)	11.0	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ax VHT40 (Average)			
Channel	Channel 106	Channel 110	Channel 134
Target (dBm)	11.5	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 106	Channel 122	--
Target (dBm)	11.0	11.0	--
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ax VHT80 (Average)			
Channel	Channel 106	Channel 122	--
Target (dBm)	10.5	10.5	--
Tolerance $\pm$ (dB)	1.0	1.0	--

UNII-3 Band

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	13.0	12.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	11.5	11.5	10.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	12.5	11.0	11.0
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11axVHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	12.0	11.5	10.5
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Average)			
Channel	Channel 151	Channel 159	--
Target (dBm)	12.0	11.5	--
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 151	Channel 159	--
Target (dBm)	12.0	11.5	--
Tolerance $\pm$ (dB)	1.0	1.0	--
IEEE 802.11ax VHT40 (Average)			
Channel	Channel 151	Channel 159	
Target (dBm)	12.5	11.5	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 155	--	--
Target (dBm)	12.0	--	--
Tolerance $\pm$ (dB)	1.0	--	--
IEEE 802.11ax VHT80 (Average)			
Channel	Channel 155	--	--
Target (dBm)	12.0	--	--
Tolerance $\pm$ (dB)	1.0	--	--

8 MEASUREMENT RESULTS

8.1 Standalone MPE

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r=20\text{cm}$, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

WiFi 2.4GHz Band

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11b	13.5	22.387	3.7	2.34	0.0104	1.0000
IEEE 802.11g	13.0	19.953	3.7	2.34	0.0093	1.0000
IEEE 802.11n HT20	13.5	22.387	3.7	2.34	0.0104	1.0000
IEEE 802.11n HT40	12.0	15.849	3.7	2.34	0.0074	1.0000
IEEE 802.11ax HE20	12.0	15.849	3.7	2.34	0.0074	1.0000
IEEE 802.11ax HE40	12.0	15.849	3.7	2.34	0.0074	1.0000

UNII-1 Band

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11a	13.0	19.953	5.1	3.24	0.0128	1.0000
IEEE 802.11n HT20	13.5	22.387	5.1	3.24	0.0144	1.0000
IEEE 802.11ac VHT20	12.5	17.783	5.1	3.24	0.0115	1.0000
IEEE 802.11ax VHT20	12.5	17.783	5.1	3.24	0.0115	1.0000
IEEE 802.11n HT40	12.0	15.849	5.1	3.24	0.0102	1.0000
IEEE 802.11ac VHT40	12.5	17.783	5.1	3.24	0.0115	1.0000
IEEE 802.11ax VHT40	12.5	17.783	5.1	3.24	0.0115	1.0000
IEEE 802.11ac VHT80	11.5	14.125	5.1	3.24	0.0091	1.0000
IEEE 802.11ax VHT80	12.5	17.783	5.1	3.24	0.0115	1.0000

UNII-2A Band

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11a	13.0	19.953	4.8	3.02	0.0120	1.0000
IEEE 802.11n HT20	12.5	17.783	4.8	3.02	0.0107	1.0000
IEEE 802.11ac VHT20	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11ax VHT20	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11n HT40	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11ac VHT40	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11ax VHT40	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11ac VHT80	12.0	15.849	4.8	3.02	0.0095	1.0000
IEEE 802.11ax VHT80	12.5	17.783	4.8	3.02	0.0107	1.0000

UNII-2C Band

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11a	12.5	17.783	5.4	3.47	0.0123	1.0000
IEEE 802.11n HT20	10.5	11.220	5.4	3.47	0.0077	1.0000
IEEE 802.11ac VHT20	11.0	12.589	5.4	3.47	0.0087	1.0000
IEEE 802.11ax VHT20	11.5	14.125	5.4	3.47	0.0097	1.0000
IEEE 802.11n HT40	11.0	12.589	5.4	3.47	0.0087	1.0000
IEEE 802.11ac VHT40	11.0	12.589	5.4	3.47	0.0087	1.0000
IEEE 802.11ax VHT40	11.5	14.125	5.4	3.47	0.0097	1.0000
IEEE 802.11ac VHT80	11.0	12.589	5.4	3.47	0.0087	1.0000
IEEE 802.11ax VHT80	10.5	11.220	5.4	0.0077	0.0092	1.0000

UNII-3 Band

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
IEEE 802.11a	13.0	19.953	4.3	2.69	0.0107	1.0000
IEEE 802.11n HT20	11.5	14.125	4.3	2.69	0.0076	1.0000
IEEE 802.11ac VHT20	12.5	17.783	4.3	2.69	0.0095	1.0000
IEEE 802.11ax VHT20	12.0	15.849	4.3	2.69	0.0085	1.0000
IEEE 802.11n HT40	12.0	15.849	4.3	2.69	0.0085	1.0000
IEEE 802.11ac VHT40	12.0	15.849	4.3	2.69	0.0085	1.0000
IEEE 802.11ax VHT40	12.5	17.783	4.3	2.69	0.0095	1.0000
IEEE 802.11ac VHT80	12.0	15.849	4.3	2.69	0.0085	1.0000
IEEE 802.11ax VHT80	12.0	15.849	4.3	2.69	0.0085	1.0000

Remark:

1. Output power including tune-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

9 CONCLUSION

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

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