

**Maximum Permissible Exposure Report****1. Product Information**

EUT	:	3000Mbps WiFi6 Repeater
Test Model	:	2505010
Power Supply	:	Input: 100-240V~, 50/60Hz, 50mA
Hardware Version	:	/
Software Version	:	/
WIFI(2.4G Band)		
Frequency Range	:	2412MHz~2462MHz
Channel Number	:	11 Channels for 20MHz bandwidth(2412~2462MHz) 7 Channels for 40MHz bandwidth(2422~2452MHz)
Channel Spacing	:	5MHz
Modulation Type	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	Antenna0: External Antenna, 4.86dBi(Max.) Antenna1: External Antenna, 4.86dBi(Max.)
WIFI(5.2G Band)		
Frequency Range	:	5150MHz~5250MHz
Channel Number	:	4 channels for 20MHz bandwidth(5180MHz~5240MHz) 2 channels for 40MHz bandwidth(5190MHz~5230MHz) 1 channels for 80MHz bandwidth(5210MHz) 1 channels for 160MHz bandwidth(5250MHz)
Modulation Type	:	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	Antenna0: External Antenna, 5.12dBi(Max.) Antenna1: External Antenna, 5.12dBi(Max.) Antenna2: External Antenna, 5.12dBi(Max.)
WIFI(5.3G Band)		
Frequency Range	:	5250-5350MHz
Channel Number	:	4 Channels for 20MHz bandwidth(5260MHz-5320MHz) 2 channels for 40MHz bandwidth(5270MHz~5310MHz) 1 channels for 80MHz bandwidth(5290MHz) 1 channels for 160MHz bandwidth(5250MHz)
Modulation Type	:	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)



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	IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	Antenna0: External Antenna, 5.12dBi(Max.) Antenna1: External Antenna, 5.12dBi(Max.) Antenna2: External Antenna, 5.12dBi(Max.)
WIFI(5.5G Band)	
Frequency Range	5470-5725MHz
Channel Number	11 Channels for 20MHz bandwidth(5500MHz-5700MHz) 5 Channels for 40MHz bandwidth(5510MHz-5670MHz) 2 Channels for 80MHz bandwidth(5530MHz, 5610MHz) 1 channels for 160MHz bandwidth(5570MHz)
Modulation Type	IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	Antenna0: External Antenna, 5.12dBiMax.) Antenna1: External Antenna, 5.12dBi(Max.) Antenna2: External Antenna, 5.12dBi(Max.)
WIFI(5.8G Band)	
Frequency Range	: 5725MHz~5850MHz
Channel Number	: 5 channels for 20MHz bandwidth(5745MHz~5825MHz) 2 channels for 40MHz bandwidth(5755MHz~5795MHz) 1 channels for 80MHz bandwidth(5775MHz)
Modulation Type	: IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDM (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Antenna0: External Antenna, 5.71dBi(Max.) Antenna1: External Antenna, 5.71dBi(Max.) Antenna2: External Antenna, 5.71dBi(Max.)
Exposure category	: General population/uncontrolled environment
EUT Type	: Production Unit
Device Type	: Mobile Device



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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 C95.1-2019](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz 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.



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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/Uncontrolled 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



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6. Conducted Power and Manufacturing Tolerance

Note: only list the worst result in this item

[2.4G WIFI MIMO]

Mode	Frequency (MHz)	Total Power (dBm)			Target (dBm)	Tolerance ±(dB)
		Ant0	Ant1	Ant0+Ant1		
n20	2412	14.06	12.60	16.40	16.0	1.0
n20	2437	13.45	12.37	15.95	16.0	1.0
n20	2462	13.27	12.64	15.98	16.0	1.0
n40	2422	13.00	11.23	15.21	16.0	1.0
n40	2437	12.78	11.88	15.36	16.0	1.0
n40	2452	12.59	11.56	15.12	16.0	1.0
ax20	2412	13.91	12.69	16.35	16.0	1.0
ax20	2437	13.30	12.79	16.06	16.0	1.0
ax20	2462	13.17	12.71	15.96	16.0	1.0
ax40	2422	12.38	11.60	15.02	16.0	1.0
ax40	2437	12.42	11.70	15.09	16.0	1.0
ax40	2452	12.75	12.01	15.41	16.0	1.0

[5.2G WIFI MIMO]

Mode	Frequency (MHz)	Total Power (dBm)				Target (dBm)	Tolerance ±(dB)
		Ant0	Ant1	Ant2	Ant0+Ant1+ Ant2		
n20	5180	11.44	10.34	9.95	15.39	15.0	1.0
n20	5200	12.06	10.63	10.23	15.82	15.0	1.0
n20	5240	11.94	10.74	10.14	15.78	15.0	1.0
n40	5190	10.08	9.67	9.09	14.40	15.0	1.0
n40	5230	10.07	9.17	8.74	14.13	15.0	1.0
ac20	5180	11.00	10.25	10.04	15.22	15.0	1.0
ac20	5200	11.71	10.39	10.04	15.55	15.0	1.0
ac20	5240	11.69	10.61	9.48	15.46	15.0	1.0
ac40	5190	11.05	10.01	9.12	14.90	15.0	1.0
ac40	5230	10.20	9.36	8.78	14.26	15.0	1.0
ac80	5210	10.23	9.39	7.84	14.03	15.0	1.0
ax20	5180	11.24	9.85	9.73	15.10	15.0	1.0
ax20	5200	11.78	9.64	10.16	15.40	15.0	1.0
ax20	5240	11.08	9.35	9.39	14.79	15.0	1.0
ax40	5190	10.52	8.92	8.23	14.10	15.0	1.0
ax40	5230	10.68	8.78	8.87	14.31	15.0	1.0
ax80	5210	9.73	8.15	8.17	13.52	14.0	1.0



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[5.3G WIFI MIMO]

Mode	Frequency (MHz)	Total Power (dBm)				Target (dBm)	Tolerance ±(dB)
		Ant0	Ant1	Ant2	Ant0+Ant1+ Ant2		
n20	5260	11.91	10.91	9.69	15.70	15.0	1.0
n20	5300	11.73	10.73	9.68	15.56	15.0	1.0
n20	5320	12.14	11.26	9.82	15.95	15.0	1.0
n40	5270	10.36	9.81	8.55	14.41	15.0	1.0
n40	5310	11.06	10.08	8.91	14.88	15.0	1.0
ac20	5260	12.08	10.85	10.22	15.89	15.0	1.0
ac20	5300	11.47	11.09	9.82	15.62	15.0	1.0
ac20	5320	12.11	11.06	10.12	15.94	15.0	1.0
ac40	5270	10.84	9.92	8.13	14.54	15.0	1.0
ac40	5310	10.72	9.90	9.05	14.71	15.0	1.0
ac80	5290	9.71	8.48	7.79	13.50	15.0	1.0
ax20	5260	11.51	10.95	9.41	15.48	15.0	1.0
ax20	5300	12.06	10.80	9.42	15.66	15.0	1.0
ax20	5320	11.39	10.29	9.93	15.35	15.0	1.0
ax40	5270	10.22	9.66	9.02	14.43	15.0	1.0
ax40	5310	10.66	10.09	9.02	14.75	15.0	1.0
ax80	5290	9.47	8.36	7.73	13.35	14.0	1.0
ac160	5250	7.90	6.91	5.95	11.76	11.0	1.0
ax160	5250	7.94	6.93	5.68	11.72	11.0	1.0





[5.5WIFI MIMO]

Condition	Mode	Frequency (MHz)	Total Power (dBm)				Target (dBm)	Tolerance ±(dB)
			Ant0	Ant1	Ant2	Ant0+Ant1+ Ant2		
NVNT	n20	5500	11.54	10.85	9.58	15.50	15.0	1.0
NVNT	n20	5580	11.89	10.63	9.53	15.56	15.0	1.0
NVNT	n20	5700	11.83	10.46	10.12	15.64	15.0	1.0
NVNT	n40	5510	10.21	9.58	8.4	14.23	15.0	1.0
NVNT	n40	5550	10.52	9.90	8.75	14.56	15.0	1.0
NVNT	n40	5670	10.76	10.08	8.75	14.71	15.0	1.0
NVNT	ac20	5500	11.53	10.72	9.82	15.52	15.0	1.0
NVNT	ac20	5580	11.91	10.56	10.14	15.71	15.0	1.0
NVNT	ac20	5700	11.85	10.42	9.92	15.58	15.0	1.0
NVNT	ac40	5510	10.61	9.66	8.36	14.41	15.0	1.0
NVNT	ac40	5550	10.52	10.08	8.45	14.54	15.0	1.0
NVNT	ac40	5670	10.78	9.45	8.43	14.43	15.0	1.0
NVNT	ac80	5530	9.51	9.09	7.61	13.58	14.0	1.0
NVNT	ac80	5610	9.57	8.66	7.57	13.45	14.0	1.0
NVNT	ax20	5500	12.17	10.61	9.68	15.71	15.0	1.0
NVNT	ax20	5580	11.92	10.51	10.04	15.67	15.0	1.0
NVNT	ax20	5700	11.85	10.39	9.52	15.47	15.0	1.0
NVNT	ax40	5510	10.33	9.68	8.31	14.29	15.0	1.0
NVNT	ax40	5550	10.48	10.02	8.46	14.51	15.0	1.0
NVNT	ax40	5670	10.74	9.38	8.41	14.39	15.0	1.0
NVNT	ax80	5530	10.24	9.11	7.54	13.87	14.0	1.0
NVNT	ax80	5610	9.58	8.74	7.58	13.48	14.0	1.0
NVNT	ac160	5570	8.02	7.11	5.91	11.87	12.0	1.0
NVNT	ax160	5570	8.22	5.17	6.15	11.48	12.0	1.0



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[5.8G WIFI MIMO]

Condition	Mode	Frequency (MHz)	Total Power (dBm)				Target (dBm)	Tolerance ±(dB)
			Ant0	Ant1	Ant2	Ant0+Ant1+Ant2		
NVNT	n20	5745	11.34	10.61	10.05	15.47	15.0	1.0
NVNT	n20	5785	12.10	10.44	9.93	15.70	15.0	1.0
NVNT	n20	5825	11.49	10.78	9.38	15.41	15.0	1.0
NVNT	n40	5755	10.96	10.07	8.63	14.76	15.0	1.0
NVNT	n40	5795	10.63	9.62	8.8	14.52	15.0	1.0
NVNT	ac20	5745	11.90	10.64	10.15	15.73	15.0	1.0
NVNT	ac20	5785	11.45	10.41	8.97	15.16	15.0	1.0
NVNT	ac20	5825	11.01	10.66	9.18	15.12	15.0	1.0
NVNT	ac40	5755	10.54	10.04	8.48	14.54	15.0	1.0
NVNT	ac40	5795	10.21	9.75	8.31	14.27	15.0	1.0
NVNT	ac80	5775	9.68	8.39	7.74	13.45	14.0	1.0
NVNT	ax20	5745	11.71	10.62	10.03	15.61	15.0	1.0
NVNT	ax20	5785	11.45	10.43	8.59	15.08	15.0	1.0
NVNT	ax20	5825	11.83	10.68	8.96	15.42	15.0	1.0
NVNT	ax40	5755	10.56	10.05	8.46	14.55	15.0	1.0
NVNT	ax40	5795	10.23	9.77	8.28	14.27	15.0	1.0
NVNT	ax80	5775	9.62	9.19	7.78	13.70	14.0	1.0





7. Measurement Results

7.1 Standalone MPE Evaluation

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.

[2.4G WIFI MIMO]

mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	MPE ratios
	dBm	mW					
Max. Power including Tune-up Tolerance	17.0	50.1187	4.86	3.0620	0.0305	1.0000	0.0305

[5.2G WIFI MIMO]

mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	MPE ratios
	dBm	mW					
Max. Power including Tune-up Tolerance	16.0	39.8107	5.12	3.2509	0.0257	1.0000	0.0257

[5.3G WIFI MIMO]

mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	MPE ratios
	dBm	mW					
Max. Power including Tune-up Tolerance	16.0	39.8107	5.12	3.2509	0.0257	1.0000	0.0257

[5.5G WIFI MIMO]

mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	MPE ratios
	dBm	mW					
Max. Power including Tune-up Tolerance	16.0	39.8107	5.12	3.2509	0.0257	1.0000	0.0257

[5.8G WIFI MIMO]

mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	MPE ratios
	dBm	mW					
Max. Power including Tune-up Tolerance	16.0	39.8107	5.71	3.7239	0.0295	1.0000	0.0295

Remark:

1. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.
3. only list the worst result in this item





8.2 Simultaneous Transmission MPE Evaluation

Maximum Simultaneous transmission MPE Ratio for WLAN

The EUT supports Wi-Fi 2.4GHz + Wi-Fi 5GHz simultaneous transmissions

Mode	2.4GWIFI MPE ratios	5GWIFI MPE ratios	Σ MPE ratios	Limit	Results
2.4GWIFI MIMO &5.2GWIFI IMIMO	0.0305	0.0243	0.0548	1.000	Pass
2.4GWIFI MIMO &5.3GWIFI IMIMO	0.0305	0.0305	0.061	1.000	Pass
2.4GWIFI MIMO &5.5GWIFI IMIMO	0.0305	0.0305	0.061	1.000	Pass
2.4GWIFI MIMO &5.8GWIFI IMIMO	0.0305	0.0295	0.06	1.000	Pass

Note :only list the worst result in this item

8. 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-----



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