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Maximum Permissive Exposure

FCC ID: 2AU3BU9W43
 Product Name: WiFi module
 M/N: U9W43

1. According to FCC CFR 47 §1.1310, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b).

Table 1 Limits for Maximum Permissible Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational / Control Exposures (f = frequency)				
30-300	61.4	0.163	1.0	6
300-1500	---	---	f/300	6
1500-100,000	---	---	5.0	6
(B) Limits for General Population / Uncontrolled Exposures (f = frequency)				
30-300	27.5	0.073	0.2	30
300-1500	---	---	f/1500	30
1500-100,000	---	---	1.0	30

2. MPE Calculation

GT Technology Chongqing Limited declares that the product described above has been evaluated and found to comply with the RF exposure limits for humans, as specified based on ANSI/FCC recommendation.

RF Exposure Calculations: $S = (P * G) / (4 * \pi * r^2)$ or $r = \sqrt{(P * G) / (4 * \pi * S)}$

2.1. Estimation Result

Bluetooth:

Mode	Frequency (MHz)	PK Output power (dBm)	Output power (mW)	antenna Gain (dBi)	antenna Gain (linear)	MPE (mW/cm ²)
GFSK (DSS)	2402	10.143	10.33	-0.42	0.91	0.00187
	2441	10.251	10.59	-0.42	0.91	0.00191
	2480	11.018	12.64	-0.42	0.91	0.00228
8-DPSK (DSS)	2402	10.167	10.39	-0.42	0.91	0.00188
	2441	10.296	10.71	-0.42	0.91	0.00193
	2480	10.959	12.47	-0.42	0.91	0.00225
GFSK (DTS)	2402	10.021	10.05	-0.42	0.91	0.00182
	2440	10.196	10.46	-0.42	0.91	0.00189
	2480	10.898	12.30	-0.42	0.91	0.00222

WiFi 2.4GHz (SISO):

Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)	
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB
11b (DTS)	2412	18.29	17.75	67.45	59.57	-1.04	-2.61	0.79	0.55	0.01057	0.00650
	2437	18.44	18.24	69.82	66.68	-1.04	-2.61	0.79	0.55	0.01094	0.00728
	2462	18.26	18.26	66.99	66.99	-1.04	-2.61	0.79	0.55	0.01049	0.00731
11g (DTS)	2412	17.78	17.16	59.98	52.00	-1.04	-2.61	0.79	0.55	0.00940	0.00567
	2437	17.27	17.33	53.33	54.08	-1.04	-2.61	0.79	0.55	0.00836	0.00590
	2462	17.41	17.51	55.08	56.36	-1.04	-2.61	0.79	0.55	0.00863	0.00615
11n HT20 (DTS)	2412	16.54	16.13	45.08	41.02	-1.04	-2.61	0.79	0.55	0.00706	0.00448
	2437	16.22	16.13	41.88	41.02	-1.04	-2.61	0.79	0.55	0.00656	0.00448
	2462	16.58	16.29	45.50	42.56	-1.04	-2.61	0.79	0.55	0.00713	0.00464
11n HT40 (DTS)	2422	16.41	16.03	43.75	40.09	-1.04	-2.61	0.79	0.55	0.00685	0.00437
	2437	16.44	16.13	44.06	41.02	-1.04	-2.61	0.79	0.55	0.00690	0.00448
	2452	16.40	16.39	43.65	43.55	-1.04	-2.61	0.79	0.55	0.00684	0.00475



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WiFi 2.4GHz (MIMO):

Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)		
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	Total
11n HT20 (DTS)	2412	19.17	15.59	82.60	36.22	-1.04	-2.61	0.79	0.55	0.01294	0.00395	0.01689
	2437	16.26	18.12	42.27	64.86	-1.04	-2.61	0.79	0.55	0.00662	0.00708	0.01370
	2462	18.35	16.27	68.39	42.36	-1.04	-2.61	0.79	0.55	0.01071	0.00462	0.01533
11n HT40 (DTS)	2422	16.26	17.95	42.27	62.37	-1.04	-2.61	0.79	0.55	0.00662	0.00681	0.01343
	2437	18.67	16.12	73.62	40.93	-1.04	-2.61	0.79	0.55	0.01153	0.00447	0.01600
	2452	16.36	18.12	43.25	64.86	-1.04	-2.61	0.79	0.55	0.00678	0.00708	0.01386

WiFi 5GHz (SISO):

Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)	
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB
11a (U-NII-1)	5180	13.43	13.54	22.03	22.59	1.42	1.25	1.39	1.33	0.00608	0.00600
	5200	13.59	13.86	22.86	24.32	1.42	1.25	1.39	1.33	0.00631	0.00646
	5240	13.81	14.12	24.04	25.82	1.42	1.25	1.39	1.33	0.00664	0.00685
11n HT20 (U-NII-1)	5180	13.50	13.44	22.39	22.08	1.42	1.25	1.39	1.33	0.00618	0.00586
	5200	13.55	13.74	22.65	23.66	1.42	1.25	1.39	1.33	0.00625	0.00628
	5240	13.35	13.90	21.63	24.55	1.42	1.25	1.39	1.33	0.00597	0.00652
11n HT40 (U-NII-1)	5190	12.90	12.82	19.50	19.14	1.42	1.25	1.39	1.33	0.00538	0.00508
	5230	13.08	13.24	20.32	21.09	1.42	1.25	1.39	1.33	0.00561	0.00560
11ac VHT20 (U-NII-1)	5180	13.50	13.37	22.39	21.73	1.42	1.25	1.39	1.33	0.00618	0.00577
	5200	13.54	13.74	22.59	23.66	1.42	1.25	1.39	1.33	0.00624	0.00628
	5240	13.57	13.70	22.75	23.44	1.42	1.25	1.39	1.33	0.00628	0.00622
11ac VHT40 (U-NII-1)	5190	12.66	12.91	18.45	19.54	1.42	1.25	1.39	1.33	0.00509	0.00519
	5230	13.12	13.54	20.51	22.59	1.42	1.25	1.39	1.33	0.00566	0.00600
11ac VHT80 (U-NII-1)	5210	12.60	13.38	18.20	21.78	1.42	1.25	1.39	1.33	0.00502	0.00578



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Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)	
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB
11a (U-NII-3)	5745	12.11	14.33	16.26	27.10	0.98	-0.28	1.25	0.94	0.00405	0.00506
	5785	13.20	14.29	20.89	26.85	0.98	-0.28	1.25	0.94	0.00521	0.00501
	5825	13.03	14.66	20.09	29.24	0.98	-0.28	1.25	0.94	0.00501	0.00546
11n HT20 (U-NII-3)	5745	12.74	14.52	18.79	28.31	0.98	-0.28	1.25	0.94	0.00469	0.00528
	5785	12.88	14.37	19.41	27.35	0.98	-0.28	1.25	0.94	0.00484	0.00510
	5825	12.65	14.51	18.41	28.25	0.98	-0.28	1.25	0.94	0.00459	0.00527
11n HT40 (U-NII-3)	5755	12.17	13.70	16.48	23.44	0.98	-0.28	1.25	0.94	0.00411	0.00437
	5795	12.03	13.94	15.96	24.77	0.98	-0.28	1.25	0.94	0.00398	0.00462
11ac VHT20 (U-NII-3)	5745	12.86	14.32	19.32	27.04	0.98	-0.28	1.25	0.94	0.00482	0.00505
	5785	13.14	14.27	20.61	26.73	0.98	-0.28	1.25	0.94	0.00514	0.00499
	5825	12.99	14.43	19.91	27.73	0.98	-0.28	1.25	0.94	0.00497	0.00518
11ac VHT40 (U-NII-3)	5755	12.37	13.69	17.26	23.39	0.98	-0.28	1.25	0.94	0.00430	0.00436
	5795	12.57	13.89	18.07	24.49	0.98	-0.28	1.25	0.94	0.00451	0.00457
11ac VHT80 (U-NII-3)	5775	12.42	13.74	17.46	23.66	0.98	-0.28	1.25	0.94	0.00435	0.00442

WiFi 5GHz (MIMO):

Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)		
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	Total
11n HT20 (U-NII-1)	5180	12.07	12.62	16.11	18.28	1.42	1.25	1.39	1.33	0.00445	0.00505	0.00950
	5200	13.20	14.08	20.89	25.59	1.42	1.25	1.39	1.33	0.00577	0.00706	0.01283
	5240	12.89	13.73	19.45	23.60	1.42	1.25	1.39	1.33	0.00537	0.00652	0.01189
11n HT40 (U-NII-1)	5190	12.18	13.16	16.52	20.70	1.42	1.25	1.39	1.33	0.00456	0.00571	0.01027
	5230	12.20	13.29	16.60	21.33	1.42	1.25	1.39	1.33	0.00458	0.00589	0.01047
11ac VHT20 (U-NII-1)	5180	12.87	13.51	19.36	22.44	1.42	1.25	1.39	1.33	0.00535	0.00619	0.01154
	5200	12.90	13.80	19.50	23.99	1.42	1.25	1.39	1.33	0.00538	0.00662	0.01200
	5240	13.07	13.51	20.28	22.44	1.42	1.25	1.39	1.33	0.00560	0.00619	0.01179
11ac VHT40 (U-NII-1)	5190	11.74	12.33	14.93	17.10	1.42	1.25	1.39	1.33	0.00412	0.00472	0.00884
	5230	13.06	13.53	20.23	22.54	1.42	1.25	1.39	1.33	0.00558	0.00622	0.01180
11ac VHT80 (U-NII-1)	5210	11.86	12.68	15.35	18.54	1.42	1.25	1.39	1.33	0.00424	0.00512	0.00936



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Mode	Frequency (MHz)	PK Output power (dBm)		Output power (mW)		antenna Gain (dBi)		antenna Gain (linear)		MPE (mW/cm ²)		
		ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	ANTA	ANTB	Total
11n HT20 (U-NII-3)	5745	12.48	13.56	17.70	22.70	0.98	-0.28	1.25	0.94	0.00442	0.00424	0.00866
	5785	11.87	13.67	15.38	23.28	0.98	-0.28	1.25	0.94	0.00384	0.00434	0.00818
	5825	12.68	13.69	18.54	23.39	0.98	-0.28	1.25	0.94	0.00462	0.00436	0.00898
11n HT40 (U-NII-3)	5755	11.09	13.10	12.85	20.42	0.98	-0.28	1.25	0.94	0.00321	0.00381	0.00702
	5795	12.34	13.23	17.14	21.04	0.98	-0.28	1.25	0.94	0.00428	0.00393	0.00821
11ac VHT20 (U-NII-3)	5745	11.60	13.34	14.45	21.58	0.98	-0.28	1.25	0.94	0.00361	0.00403	0.00764
	5785	12.94	14.01	19.68	25.18	0.98	-0.28	1.25	0.94	0.00491	0.00470	0.00961
	5825	12.05	13.88	16.03	24.43	0.98	-0.28	1.25	0.94	0.00400	0.00456	0.00856
11ac VHT40 (U-NII-3)	5755	11.76	13.00	15.00	19.95	0.98	-0.28	1.25	0.94	0.00374	0.00372	0.00746
	5795	11.81	13.26	15.17	21.18	0.98	-0.28	1.25	0.94	0.00378	0.00395	0.00773
11ac VHT80 (U-NII-3)	5775	11.96	12.98	15.70	19.86	0.98	-0.28	1.25	0.94	0.00392	0.00371	0.00763

Based on safety distance (r) **20cm**, the antenna gain (G) is **ANTA: 0.79 Numerical, ANTB: 0.55 Numerical**, and the highest power output (P) is **ANTA: 82.60mW, ANTB: 36.22mW**, the power density (S) is **0.01689mW/cm²**.

Pursuant to RSS 102 section 4 table 4, the simultaneous MPE evaluation is as following:

Bluetooth MPE (mW/cm ²)	2.4G MPE (mW/cm ²)	Total MPE (mW/cm ²)	Limit (mW/cm ²)	Compliance or not
0.00228	0.01689	0.01917	1	YES

Bluetooth MPE (mW/cm ²)	5G MPE (mW/cm ²)	Total MPE (mW/cm ²)	Limit (mW/cm ²)	Compliance or not
0.00228	0.01283	0.01511	1	YES