8. RADIO FREQUENCY EXPOSURE

8.1. Limit

According to §1.1310 and §2.1091 RF exposure is calculated.

Table: Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (S) (mW/cm2)
0.3–1.34	*(100)
1.34–30	*($180/f^2$)
30–300	0.2
300–1500	f/1500
1500–100,000	1.0

F = frequency in MHz

* = Plane-wave equivalent power density

Maximum Permissible Exposure

The MPE was calculated at 20cm to show compliance with the power density limit.

$S = PG/4\pi R^2$

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.

Note:

1. Manufacturer declared that the maximum antenna gain is 3.3 dBi(Max.) for 2412~2462MHz and 2.3 dBi(Max.) for 5150.00~5250.00MHz/5725.00~5850.00MHz.
2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.
3. Only record worst case data.

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8.2 Test Results

Standalone MPE

5G WIFI

Test	Channel	ANT Power (dBm)	ANT Max. Tune Up Power (dBm)	ANT Max. Tune Up Power (mW)	ANT MPE (mW/cm^2)	Limit (mW/cm^2)
802.11a	36	9.884	9.0±1.0	10.0000	0.0034	1.0
	40	8.974	9.0±1.0	10.0000	0.0034	1.0
	48	8.984	9.0±1.0	10.0000	0.0034	1.0
	149	12.182	12.0±1.0	19.9526	0.0068	1.0
	157	11.192	12.0±1.0	19.9526	0.0068	1.0
	165	11.072	12.0±1.0	19.9526	0.0068	1.0
802.11n20	36	9.856	9.0±1.0	10.0000	0.0034	1.0
	40	9.456	9.0±1.0	10.0000	0.0034	1.0
	48	8.546	9.0±1.0	10.0000	0.0034	1.0
	149	12.437	12.0±1.0	19.9526	0.0068	1.0
	157	11.487	12.0±1.0	19.9526	0.0068	1.0
	165	11.307	12.0±1.0	19.9526	0.0068	1.0
802.11n40	38	9.699	9.0±1.0	10.0000	0.0034	1.0
	46	9.099	9.0±1.0	10.0000	0.0034	1.0
	151	11.397	11.0±1.0	15.8489	0.0054	1.0
	159	11.207	11.0±1.0	15.8489	0.0054	1.0
802.11ac20	36	10.536	10.0±1.0	12.5893	0.0043	1.0
	40	10.986	10.0±1.0	12.5893	0.0043	1.0
	48	10.706	10.0±1.0	12.5893	0.0043	1.0
	149	12.736	12.0±1.0	19.9526	0.0068	1.0
	157	12.186	12.0±1.0	19.9526	0.0068	1.0
	165	11.806	12.0±1.0	19.9526	0.0068	1.0
802.11ac40	38	10.488	11.0±1.0	15.8489	0.0054	1.0
	46	11.208	11.0±1.0	15.8489	0.0054	1.0
	151	12.065	12.0±1.0	19.9526	0.0068	1.0
	159	11.315	12.0±1.0	19.9526	0.0068	1.0
802.11ac80	42	11.172	11.0±1.0	15.8489	0.0054	1.0
	155	11.998	11.0±1.0	15.8489	0.0054	1.0

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2.4G wifi:

Test	Channel	ANT Power (dBm)	ANT Max. Tune Up Power (dBm)	ANT Max. Tune Up Power (mW)	ANT MPE (mW/cm^2)	Limit (mW/cm^2)
802.11b	1	14.42	14.0±1.0	31.6228	0.0135	1.0
	6	14.77	14.0±1.0	31.6228	0.0135	1.0
	11	14.55	14.0±1.0	31.6228	0.0135	1.0
802.11g	1	12.81	13.0±1.0	25.1189	0.0107	1.0
	6	13.64	13.0±1.0	25.1189	0.0107	1.0
	11	13.38	13.0±1.0	25.1189	0.0107	1.0
802.11n20	1	12.66	13.0±1.0	25.1189	0.0107	1.0
	6	13.88	13.0±1.0	25.1189	0.0107	1.0
	11	13.67	13.0±1.0	25.1189	0.0107	1.0
802.11n40	3	13.01	13.0±1.0	25.1189	0.0107	1.0
	6	13.97	13.0±1.0	25.1189	0.0107	1.0
	9	13.66	13.0±1.0	25.1189	0.0107	1.0

Note: The estimation distance is 20cm

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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