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## FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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### Applicable Standard

According to subpart 15.247 (i) and subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

### Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

**Calculated Data (worst case):**

**Model: L1563**

**2.4G Wi-Fi/BLE/BT:**

Mode	Frequency Range (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412-2462	2.19	1.66	23.00	199.53	20	0.0659	1.0
802.11g		2.19	1.66	24.00	251.19	20	0.0829	1.0
802.11n-HT20		2.19	1.66	24.00	251.19	20	0.0829	1.0
802.11n-HT40	2422-2452	2.19	1.66	23.50	223.87	20	0.0739	1.0
BLE (1Mbps)	2402-2480	2.19	1.66	0.50	1.12	20	0.0004	1.0
BLE (2Mbps)	2402-2480	2.19	1.66	1.00	1.26	20	0.0004	1.0
BT	2402-2480	2.19	1.66	9.50	8.91	20	0.0029	1.0

**5G Wi-Fi:**

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
802.11a	5150~5250	0.05	1.01	18.50	70.79	20	0.0142	1.0
	5725~5850	0.05	1.01	21.00	125.89	20	0.0253	1.0
802.11ac20	5150~5250	0.05	1.01	20.50	112.20	20	0.0225	1.0
	5725~5850	0.05	1.01	23.00	199.53	20	0.0401	1.0
802.11n20	5150~5250	0.05	1.01	20.50	112.20	20	0.0225	1.0
	5725~5850	0.05	1.01	23.00	199.53	20	0.0401	1.0
802.11ac40	5150~5250	0.05	1.01	16.00	39.81	20	0.0080	1.0
	5725~5850	0.05	1.01	22.50	177.83	20	0.0357	1.0
802.11n40	5150~5250	0.05	1.01	16.00	39.81	20	0.0080	1.0
	5725~5850	0.05	1.01	22.50	177.83	20	0.0357	1.0
802.11ac80	5150~5250	0.05	1.01	10.50	11.22	20	0.0023	1.0
	5725~5850	0.05	1.01	23.00	199.53	20	0.0401	1.0

- Note:**
1. The tune up power were declared by the manufacturer.
  2. Wi-Fi and BT/BLE can't transmit simultaneously.
  3. For 802.11b, 802.11g, 802.11a, the tune-up power is base on SISO mode  
For 802.11ac20/n20/n40/ac40/ac80, the tune-up power is base on MIMO mode

**Result:** The device meet FCC MPE at 20 cm distance.

**Model: L1573**

**2.4G Wi-Fi/BLE/BT:**

Mode	Frequency Range (MHz)	Maximum Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412-2462	1.14	1.30	23.00	199.53	20	0.0516	1.0
802.11g		1.14	1.30	24.00	251.19	20	0.0650	1.0
802.11n-HT20		1.14	1.30	24.00	251.19	20	0.0650	1.0
802.11n-HT40	2422-2452	1.14	1.30	23.50	223.87	20	0.0579	1.0
BLE (1Mbps)	2402-2480	1.14	1.30	0.50	1.12	20	0.0003	1.0
BLE (2Mbps)	2402-2480	1.14	1.30	1.00	1.26	20	0.0003	1.0
BT	2402-2480	1.14	1.30	9.50	8.91	20	0.0023	1.0

**5G Wi-Fi:**

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
802.11a	5150~5250	1.57	1.44	18.50	70.79	20	0.0203	1.0
	5725~5850	1.57	1.44	21.00	125.89	20	0.0361	1.0
802.11ac20	5150~5250	1.57	1.44	20.50	112.20	20	0.0321	1.0
	5725~5850	1.57	1.44	23.00	199.53	20	0.0570	1.0
802.11n20	5150~5250	1.57	1.44	20.50	112.20	20	0.0321	1.0
	5725~5850	1.57	1.44	23.00	199.53	20	0.0570	1.0
802.11ac40	5150~5250	1.57	1.44	16.00	39.81	20	0.0114	1.0
	5725~5850	1.57	1.44	22.50	177.83	20	0.0509	1.0
802.11n40	5150~5250	1.57	1.44	16.00	39.81	20	0.0114	1.0
	5725~5850	1.57	1.44	22.50	177.83	20	0.0509	1.0
802.11ac80	5150~5250	1.57	1.44	10.50	11.22	20	0.0032	1.0
	5725~5850	1.57	1.44	23.00	199.53	20	0.0570	1.0

- Note:**
1. The tune up power were declared by the manufacturer.
  2. Wi-Fi and BT/BLE can't transmit simultaneously.
  3. For 802.11b, 802.11g, 802.11a, the tune-up power is base on SISO mode  
For 802.11ac20/n20/n40/ac40/ac80, the tune-up power is base on MIMO mode

**Result:** The device meet FCC MPE at 20 cm distance.