



FCC 47 CFR MPE REPORT

Eastech (Huizhou) Co., Ltd

5.1.2CH Soundbar with Wireless Subwoofer

Model Number: S5120Q

Additional Model: S5120R, S5120S, S5120QW, S5121Q, S5121R, S5121S, S512Q, S512LQ, S512S, S512LS, S512R, S512LR, S8Q, S8LQ, S8R, S8LR, SL80Q, SL81Q, SL80R, SL81R, T8, T8Q, T8R, T8S, A3120Q, A7140Q, S7140Q, S7140QW, S7140S, S7140SW, S70, S700, S71, S701, S5120DE, S5120WDE, A5120S, A5120SW, RA-B770, RA-B770F, T80QW, T5120Q

FCC ID: 2BWL4-S5120Q

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Maximum Permissible Exposure

1. Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 & KDB 447498 D04 V01 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Result and Limit

SISO

The Worst Mode	Ant.	Peak output power (dBm)	Target power (dBm)	Max Target power (dBm)	Antenna gain		Power Density (S) (mW /cm²)	Limited of Power Density (S) (mW /cm²)	Test Result
					(dBi)	(Linear)			
2.4G Band									
GFSK	ant 1	9.09	9±1	10	2.52	1.786	0.0036	1	Complies
π/4-DQPSK	ant 1	11.33	11±1	12	2.52	1.786	0.0056	1	Complies
8-DPSK	ant 1	11.97	11±1	12	2.52	1.786	0.0056	1	Complies
BLE	ant 1	5.69	5±1	6	2.52	1.786	0.0014	1	Complies
IEEE 802.11b	ant 0	17.21	17±1	18	2.56	1.803	0.0226	1	Complies
	ant 1	17.50	17±1	18	2.49	1.774	0.0223	1	Complies
IEEE 802.11g	ant 0	18.31	18±1	19	2.56	1.803	0.0285	1	Complies
	ant 1	18.68	18±1	19	2.49	1.774	0.0280	1	Complies
IEEE 802.11n HT20	ant 0	14.71	14±1	15	2.56	1.803	0.0113	1	Complies
	ant 1	16.17	16±1	17	2.49	1.774	0.0177	1	Complies
IEEE 802.11ax HE20	ant 0	16.69	16±1	17	2.56	1.803	0.0180	1	Complies
	ant 1	17.40	17±1	18	2.49	1.774	0.0223	1	Complies
IEEE 802.11n HT40	ant 0	15.33	15±1	16	2.56	1.803	0.0143	1	Complies
	ant 1	16.21	16±1	17	2.49	1.774	0.0177	1	Complies
IEEE 802.11ax HE40	ant 0	14.95	14±1	15	2.56	1.803	0.0113	1	Complies
	ant 1	15.17	15±1	16	2.49	1.774	0.0141	1	Complies
5G Band									
IEEE 802.11a	ant 0	17.73	17±1	18	3.11	2.046	0.0257	1	Complies
	ant 1	18.88	18±1	19	2.88	1.941	0.0307	1	Complies
IEEE 802.11n HT20	ant 0	12.14	12±1	13	3.11	2.046	0.0081	1	Complies
	ant 1	14.29	14±1	15	2.88	1.941	0.0122	1	Complies
IEEE 802.11ac VHT20	ant 0	12.80	12±1	13	3.11	2.046	0.0081	1	Complies
	ant 1	15.12	15±1	16	2.88	1.941	0.0154	1	Complies
IEEE 802.11ax HE20	ant 0	14.05	14±1	15	3.11	2.046	0.0129	1	Complies
	ant 1	15.72	15±1	16	2.88	1.941	0.0154	1	Complies
IEEE 802.11n HT40	ant 0	13.86	13±1	14	3.11	2.046	0.0102	1	Complies
	ant 1	15.87	15±1	16	2.88	1.941	0.0154	1	Complies
IEEE 802.11ac	ant 0	13.70	13±1	14	3.11	2.046	0.0102	1	Complies

VHT40	ant 1	15.58	15±1	16	2.88	1.941	0.0154	1	Complies
IEEE 802.11ax HE40	ant 0	13.01	13±1	14	3.11	2.046	0.0102	1	Complies
	ant 1	14.71	14±1	15	2.88	1.941	0.0122	1	Complies
IEEE 802.11ac VHT80	ant 0	12.47	12±1	13	3.11	2.046	0.0081	1	Complies
	ant 1	14.54	14±1	15	2.88	1.941	0.0122	1	Complies
IEEE 802.11ax HE80	ant 0	12.18	12±1	13	3.11	2.046	0.0081	1	Complies
	ant 1	13.87	13±1	14	2.88	1.941	0.0097	1	Complies

MIMO

Mode	Power Density (S) (mW /cm ²) Antenna 0	Power Density (S) (mW /cm ²) Antenna 1	Power Density (S) (mW /cm ²) Total	Limited of Power Density (S) (mW /cm ²)	Test Result
2.4G Band					
IEEE 802.11n HT20	0.0113	0.0177	0.0290	1	Complies
IEEE 802.11ax HE20	0.0180	0.0223	0.0403	1	Complies
IEEE 802.11n HT40	0.0143	0.0177	0.0320	1	Complies
IEEE 802.11ax HE40	0.0113	0.0141	0.0254	1	Complies
5G Band					
IEEE 802.11n HT20	0.0081	0.0122	0.0203	1	Complies
IEEE 802.11ac VHT20	0.0081	0.0154	0.0235	1	Complies
IEEE 802.11ax HE20	0.0129	0.0154	0.0283	1	Complies
IEEE 802.11n HT40	0.0102	0.0154	0.0256	1	Complies
IEEE 802.11ac VHT40	0.0102	0.0154	0.0256	1	Complies
IEEE 802.11ax HE40	0.0102	0.0122	0.0224	1	Complies
IEEE 802.11ac VHT80	0.0081	0.0122	0.0203	1	Complies
IEEE 802.11ax HE80	0.0081	0.0097	0.0178	1	Complies

For 5.8G SRD

Field strength =65.99dBuV/m@3m

$P^*G = \{ [10^{(65.99/20)} / 10^6 * 3]^2 / 30 \} * 1000mW = 0.001mW$

$Pd = (30 * 0.001) / (377 * 20^2) = 0.0000002 < 1$



Simultaneous Transmission

Mode	Max Power Density	Limit	Ratio	Total Ratio	Limit of Ratio	Result
BT	0.0056	1	0.0056	0.0459002	1	Complies
WIFI	0.0403	1	0.0403			
5.8G SRD	0.0000002	1	0.0000002			

End of Test Report