

FCC 47 CFR MPE REPORT

TCL OVERSEAS MARKETING LTD

Wireless Subwoofer

Model Number: Z100-SW

Additional Model: Z100-SW, Z101-SW, Z110-SW, Z111-SW, Z100K-SW, Z101K,

Z100-SW -A, Z100-SW -J, Z100-SW-B, Z100-SW-C, Z100-SW-JN, Z1*****-SW,

Z1*****-RS (*can be any numerica number "0~9" or alphebtical number "A~Z" or Blank)

FCC ID: 2BEHEZ100SW

Applicant:	TCL OVERSEAS MARKETING LTD
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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 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=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	9.84	9.638
	2441	9.5	8.913
	2480	9.43	8.770
$\pi/4$ -DQPSK	2402	11.82	15.205
	2441	11.76	14.997
	2480	11.73	14.894
8-DPSK	2402	12.06	16.069
	2441	11.98	15.776
	2480	12.02	15.922
BLE 1M	2402	6.17	4.140
	2440	6	3.981
	2480	5.86	3.855
BLE 2M	2402	6.24	4.207
	2440	6.07	4.046
	2480	5.93	3.917
IEEE 802.11b	2412	15.37	34.435
	2437	15.28	33.729
	2462	15	31.623
IEEE 802.11g	2412	21.95	156.675
	2437	20.71	117.761
	2462	20.59	114.551
IEEE 802.11n HT20	2412	16.24	42.073
	2437	17.29	53.580
	2462	14.71	29.580
IEEE 802.11n HT40	2422	17.63	57.943
	2437	17.82	60.534
	2452	17.43	55.335
IEEE 802.11a	5180	14.47	27.990
	5200	14.71	29.580
	5240	14.75	29.854
	5260	10.89	12.274
	5300	10.32	10.765
	5320	9.76	9.462
	5500	8.93	7.816

	5580	10.69	11.722
	5700	10.45	11.092
	5745	8.01	6.324
	5785	8.7	7.413
	5825	7.06	5.082
IEEE 802.11n HT20	5180	14.5	28.184
	5200	14.59	28.774
	5240	14.63	29.040
	5260	12.61	18.239
	5300	11.96	15.704
	5320	11.71	14.825
	5500	10.84	12.134
	5580	12.32	17.061
	5700	12.52	17.865
	5745	8.00	6.310
	5785	8.54	7.145
	5825	7.02	5.035
IEEE 802.11ac VHT20	5180	14.53	28.379
	5200	14.72	29.648
	5240	14.48	28.054
	5260	12.55	17.989
	5300	11.97	15.740
	5320	11.78	15.066
	5500	10.93	12.388
	5580	12.3	16.982
	5700	12.41	17.418
	5745	8.13	6.501
	5785	8.57	7.194
	5825	7.36	5.445
IEEE 802.11n HT40	5190	14.58	28.708
	5230	14.62	28.973
	5270	12.46	17.620
	5310	12.2	16.596
	5510	12.1	16.218
	5550	12.47	17.660
	5670	12.26	16.827
	5755	7.98	6.281
	5795	8.44	6.982
	5190	14.54	28.445

IEEE 802.11ac VHT40	5230	14.62	28.973
	5270	12.1	16.218
	5310	12.11	16.255
	5510	10.83	12.106
	5550	12.1	16.218
	5670	12.05	16.032
	5755	8.93	7.816
	5795	8.38	6.887
IEEE 802.11ac VHT80	5210	14.36	27.290
	5290	12.31	17.022
	5530	10.18	10.423
	5610	12.8	19.055
	5775	8.52	7.112

3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Test Result
				(dBi)	(Linear)			
2.4G Band								
GFSK	9.84	9±1	10	2.35	1.718	0.00342	1	Complies
π/4-DQPSK	11.82	11±1	12	2.35	1.718	0.00542	1	Complies
8-DPSK	12.06	12±1	13	2.35	1.718	0.00682	1	Complies
BLE 1M	6.17	6±1	7	2.35	1.718	0.00171	1	Complies
BLE 2M	6.24	6±1	7	2.35	1.718	0.00171	1	Complies
IEEE 802.11b	15.37	15±1	16	2.45	1.758	0.01392	1	Complies
IEEE 802.11g	21.95	21±1	22	2.45	1.758	0.05543	1	Complies
IEEE 802.11n HT20	17.29	17±1	18	2.45	1.758	0.02207	1	Complies
IEEE 802.11n HT40	17.82	17±1	18	2.45	1.758	0.02207	1	Complies
5G Band								
IEEE 802.11a	14.75	14±1	15	2.52	1.786	0.01124	1	Complies
IEEE 802.11n HT20	14.63	14±1	15	2.52	1.786	0.01124	1	Complies
IEEE802.11acVHT20	14.72	14±1	15	2.52	1.786	0.01124	1	Complies
IEEE 802.11n HT40	14.62	14±1	15	2.52	1.786	0.01124	1	Complies
IEEE802.11acVHT40	14.62	14±1	15	2.52	1.786	0.01124	1	Complies
IEEE802.11acVHT80	14.36	14±1	15	2.52	1.786	0.01124	1	Complies

MAX Power Density (S) (mW/cm ²) Bluetooth	MAX Power Density (S) (mW/cm ²) Wi-Fi	Total Ratio	Limit Ratio	Test Result
0.0068	0.0554	0.0622	1	Complies

Note: WIFI 2.4G and 5GHz bands share the same antenna, you cannot use 2.4G and 5GHz bands at the same time Operate simultaneously.

End of Test Report