FCC 47 CFR MPE REPORT

TCL Entertainment Solutions Limited

3.1 Channel Sound Bar with Wireless Subwoofer

Model Number: S643W

Additional Model: S310W, S4310, S643WE, S643WK, S643W*
(*can be any numerica number"0~9" or alphebtical number "A~Z")

FCC ID: 2ARUDS310W

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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.o	30

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

1.2. MPE Calculation Method

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

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	3.94	2.477
	2441	3.77	2.382
	2480	4.15	2.600
π/4 DQPSK	2402	4.33	2.710
	2441	4.44	2.780
	2480	4.65	2.917
8-DPSK	2402	4.33	2.710
	2441	4.40	2.754
	2480	4.65	2.917
BLE 1M	2402	3.49	2.234
	2440	3.74	2.366
	2480	4.01	2.518
BLE 2M	2402	3.73	2.360
	2440	3.98	2.500
	2480	4.28	2.679

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)			
GFSK	4.15	4±1	5	2.29	1.694	0.0011	1	Complies
π/4 DQPSK	4.65	4±1	5	2.29	1.694	0.0011	1	Complies
8-DPSK	4.65	4±1	5	2.29	1.694	0.0011	1	Complies
BLE 1M	4.01	4±1	5	2.29	1.694	0.0011	1	Complies
BLE 2M	4.28	4±1	5	2.69	1.858	0.0012	1	Complies

End of Test Report