

## FCC 47 CFR MPE REPORT

TCL Entertainment Solutions Limited

### 5.1 Channel Sound Bar with Wireless Subwoofer and Wired Satellite Speakers

Model Number: S645W

Additional Model: S510W, S4510, S645WE, S645WK, S645W\*(\*can be any  
numerica Number "0~9" or alphebtical number "A~Z")

FCC ID: 2ARUDS510W

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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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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 <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> 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

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

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	6.29	4.256
	2441	5.88	3.873
	2480	5.84	3.837
$\pi$ /4-DQPSK	2402	6.88	4.875
	2441	6.39	4.355
	2480	6.21	4.178
8-DPSK	2402	6.88	4.875
	2441	6.41	4.375
	2480	6.31	4.276
BLE 1M	2402	6.37	4.335
	2440	6.07	4.046
	2480	5.89	3.882
BLE 2M	2402	6.59	4.560
	2440	6.31	4.276
	2480	6.15	4.121
FSK	5729	0.02	1.005
	5789	-0.81	0.830
	5849	-1.85	0.653

### 3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW/cm <sup>2</sup> )	Limited of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
				(dBi)	(Linear)			
GFSK	6.29	6±1	7	2.29	1.694	0.0017	1	Complies
$\pi/4$ -DQPSK	6.88	6±1	7	2.29	1.694	0.0017	1	Complies
8-DPSK	6.88	6±1	7	2.29	1.694	0.0017	1	Complies
BLE 1M	6.37	6±1	7	2.29	1.694	0.0017	1	Complies
BLE 2M	6.59	6±1	7	2.29	1.694	0.0017	1	Complies
FSK	0.02	0±1	1	4.79	3.013	0.0008	1	Complies

#### BT+5G SRD

MAX Ture-up power ratio Bluetooth	MAX Ture-up power Total ratio 5G SRD	Total Ratio	Limit Ratio	Test Result
0.0017	0.0008	0.0025	1	Complies

Note: 2.4 and 5GHz bands are share an antenna, Can't both the 2.4 and 5 GHz bands operate simultaneously.

**End of Test Report**