Maximum Permissible Exposure Evaluation

FCC ID: 2AD33-T517KBU

EUT Specification

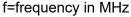| EUT	AUDIO REPUBLIC BLUETOOTH SPEAKER
Frequency Operating	☒ BT3.0: 2402MHz~2480MHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Fixed (>20cm separation) ☐ Others ___
Exposure classification	☐ Occupational/Controlled exposure (S=5mW/cm2) ☒ General Population/Uncontrolled exposure
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	-0.55dBm
Antenna gain (Max)	1.2dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

1. RF Exposure Evaluation
1.1. Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device where by a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

1.2. Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

Friis transmission formula: $Pd=(Pout*G)\backslash(4*pi*R^2)$
Where
Pd= Power density in mW/cm²
Pout=output power to antenna in mW
G= gain of antenna in linear scale
Pi=3.1416
R= distance between observation point and center of the radiator in cm
Pd the limit of MPE 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Operating Mode	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Maximum Output Power (mW)	Antenna Gain (dBi)	Power density at 20cm (mW/cm²)	Power density Limits (mW/cm²)
BT Max power	-0.55dBm	-0.55±1	0.45	1.11	1.2	0.00029	1

Note

The estimation distance is 20cm

Conclusion: No SAR evaluation required since transmitter power is below FCC threshold.

**********************THE END*********************