

RF EXPOSURE EVALUATION

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 whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

EUT Specification

FCC ID	2A7VD-H70C7					
EUT	Govee Christmas String Lights 2/Govee Christmas String					
	Lights 2S					
Frequency band (Operating)	⊠ BT: 2.402GHz ~ 2.480GHz					
	⊠ WLAN: 2.412GHz ~ 2.462GHz					
	☐ RLAN: 5.180GHz ~ 5.240GHz					
	☐ RLAN: 5.260GHz ~ 5.320GHz					
	☐ RLAN: 5.500GHz ~ 5.700GHz					
	☐ RLAN: 5.745GHz ~ 5.825GHz					
	☐ Others:					
Device category	☐ Portable (<20cm separation)					
	⊠ Mobile (>20cm separation)					
	☐ Others					
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2)					
	☐ General Population/Uncontrolled exposure (S=1mW/cm2)					
Antenna diversity	☐ Single antenna					
	⊠ Multiple antennas					
	☐ Tx diversity					
	☐ Rx diversity					
	☐ Tx/Rx diversity					
Antenna gain (Max)	BLE: 3.98dBi					
	WLAN: 1.54dBi					
Evaluation applied	⊠ MPE Evaluation					
	☐ SAR Evaluation					



Limits for Maximum Permissible Exposure(MPE)

			,					
Frequency	Electric Field	Magnetic Field	Power	Average				
Range(MHz)	Strength(V/m)	Strength(A/m)	Density(mW/cm ²)	Time				
(A) Limits for Occupational/Control Exposures								
300-1500			F/300					
1500-100000		5		6				
(B) Limits for General Population/Uncontrol Exposures								
300-1500			F/1500	6				
1500-100000			1	30				

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

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.

Max Measurement Result

Operating Mode	Measure d Power	Tune up tolerance		Max. Tune up Power	Max. Tune up Power	Antenna Gain	Antenna Gain in linear	Power density at 20cm	Power density Limits
	(dBm)	(dBn	n)	(dBm)	(mW)	(dBi)	(Numerical value)	(mW/ cm2)	(mW/cm ²)
BLE	1.76	1.76	±1	2.76	1.8880	3.98	2.5003	0.0009	1
WLAN	15.81	15.81	±1	16.81	47.9733	1.54	1.4256	0.0136	1

The Maximum simultaneous transmission for BLE+WLAN:

$$\sum_{i} \frac{S_{i}}{S_{Limit,i}}$$

 $=S_{BLE}/S_{limit} + S_{WLAN}/S_{limit}$

=0.0009/1+0.0136/1

=0.0145

< 1.0

Result: PASS



