FCC 47 CFR MPE REPORT

Klipsch Group, Inc.

Portable Bluetooth Party Speaker

Model Number: Vegas

FCC ID: STI-VEGAS

Applicant:	Klipsch Group, Inc.
Address:	3502 Woodview Trace, Indianapolis, IN 46268, USA
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

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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) = $\frac{\sqrt{30 \times P \times G}}{d}$ 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 (32883)

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	8.83	7.638
	2441	7.04	5.058
	2480	3.78	2.388
π/4-DQPSK	2402	8.72	7.447
	2441	6.96	4.966
	2480	3.71	2.350
8-DPSK	2402	8.70	7.413
	2441	6.93	4.932
	2480	3.72	2.355
BLE 1M	2402	8.52	7.112
	2440	6.95	4.955
	2480	3.62	2.301

3. Calculated Result and Limit (32883)

Mode	Peak output power (dBm)	Target power（dBm）	MAX Target power（dBm）	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
				(dBi)	(Linear)			
2.4G Band								
GFSK	8.83	8±1	9	2.3	1.698	0.00268	1	Complies
π/4-DQPSK	8.72	8±1	9	2.3	1.698	0.00268	1	Complies
8-DPSK	8.7	8±1	9	2.3	1.698	0.00268	1	Complies
BLE 1M	8.52	8±1	9	2.3	1.698	0.00268	1	Complies

4. Conducted Power Result (32889)

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	6.33	4.295
	2441	5.07	3.214
	2480	3.83	2.415
π/4-DQPSK	2402	6.28	4.246
	2441	5.00	3.162
	2480	3.76	2.377
8-DPSK	2402	6.27	4.236
	2441	5.01	3.170
	2480	3.77	2.382
BLE 1M	2402	6.16	4.130
	2440	5.03	3.184
	2480	3.79	2.393

5. Calculated Result and Limit (32889)

Mode	Peak output power (dBm)	Target power（dBm）	MAX Target power（dBm）	Antenna gain		Power Density (S) (mW /cm2)	Limited of Power Density (S) (mW /cm2)	Test Result
				(dBi)	(Linear)			
2.4G Band								
GFSK	6.33	6±1	7	2.3	1.698	0.00169	1	Complies
π/4-DQPSK	6.28	6±1	7	2.3	1.698	0.00169	1	Complies
8-DPSK	6.27	6±1	7	2.3	1.698	0.00169	1	Complies
BLE 1M	6.16	6±1	7	2.3	1.698	0.00169	1	Complies

6. Calculated Result and Limit (32883+32889)

MAX Power Density(S) (mW/cm2) 32883 Bluetooth	MAX Power Density(S) (mW/cm2) 32889 Bluetooth	Total Ratio	Limit Ratio	Test Result
0.00268	0.00169	0.00437	1	Complies

End of Test Report