1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant:	ShenZhen Rapoo Technology Co., Ltd.
Address of applicant:	22,Jinxiu Road East,Pingshan District,Shenzhen,China
Manufacturer:	The same as Applicant
Address of manufacturer:	The same as Applicant

General Description of EUT:

Product Name:	Wired/Wireless Gaming Mouse
Trade Name:	RAPOO
Model No.:	VT9PRO
Adding Model(s):	/
Rated Voltage:	DC 3.7V
Battery Capacity	300mAh
Power Adapter Model:	/
FCC ID:	PP23287
Equipment Type:	Portable device

Technical Characteristics of EUT:

Frequency Range:	2402MHz-2480MHz
Max. Field Strength:	94.81dBuV/m
Modulation:	GFSK
Quantity of Channels:	33
Channel Separation:	/
Antenna Type:	PCB Antenna
Antenna Gain:	0.8dBi

➢ **Channel List:**

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	12	2429	23	2456
2	2405	13	2431	24	2458
3	2408	14	2434	25	2460
4	2410	15	2437	26	2463
5	2414	16	2439	27	2466
6	2417	17	2442	28	2469
7	2419	18	2444	29	2471
8	2421	19	2446	30	2474
9	2423	20	2448	31	2477
10	2425	21	2451	32	2479
11	2427	22	2454	33	2480

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and KDB 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A):The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. P_{th} is given by:

$$P_{th} \ (mW) = \begin{cases} ERP_{20\ cm}(d/20\ cm)^x & d \leq 20\ cm \\ ERP_{20\ cm} & 20\ cm < d \leq 40\ cm \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm} \ (mW) = \begin{cases} 2040f & 0.3\ GHz \leq f < 1.5\ GHz \\ 3060 & 1.5\ GHz \leq f \leq 6\ GHz \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1{,}920\ R^2$
1.34-30	$3{,}450\ R^2/f^2$
30-300	$3.83\ R^2$
300-1,500	$0.0128\ R^2 f$
1,500-100,000	$19.2 R^2$

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

(B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

1.3 Calculated Result

Radio Access Technology	Prediction Frequency (MHz)	Max. Field Strength (dBuV/m)	Antenna Gain (dBi)	Output Power (dBm)	Tune-Up Power (dBm)	ERP (dBm)
SRD	2402	94.81	0.8	-1.25	-1.00	-2.35

Frequency (MHz)	Option	Min. Distance (cm)	Max. Power (dBm)	Max. Power (mW)	Exposure Limit (mW)	Ratio	Result Pass/Fail
2402	B	0.5	-1.00	0.79	2.788	0.28	Pass

Note: 1. EIRP= E-104.8+20logD; Output Power=EIRP- Antenna Gain;

EIRP=EIRP-2.15dB

2. Option A, B and C refers as clause 1.2.

3. For option B, Max (time-averaged power, effective radiated power (ERP)) converts to Max. Power. For option C, ERP converts to Max. Power;

4. For option B, P_{th} (mW) converts to Exposure Limit (mW); For option C, ERP (W) converts to Exposure Limit (mW).

5. Ratio= Tune-Up ERP (mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

Radio Access Technology	Ratio 1	Ratio 2	Ratio 3	Simultaneous Ratio	Limit	Result Pass/Fail
/	/	/	/	/	/	/

Result: Pass