RF Exposure Evaluation

FCC ID: 2A54D-MK321

1. Client Information

Applicant	:	SHENZHEN RDING TECH CO., LIMITED
Address	:	4/F, Building C (South), Zhongliantongtai industrial area, No.271 Liangbai road, Liangantian, Pinghu town, Longgang district Shenzhen, Guangdong province, China
Manufacturer	:	SHENZHEN RDING TECH CO., LIMITED
Address	:	4/F, Building C (South), Zhongliantongtai industrial area, No.271 Liangbai road, Liangantian, Pinghu town, Longgang district Shenzhen, Guangdong province, China

2. General Description of EUT

EUT Name	:	Mini Keyboard	
Model(s) No.	:	MK321-Pro, MK321BT, MK321G	
Model Difference	:	All PCB boards and circuit diagrams are the same, the only difference is that names.	
Product Description	:	RF Output Power:	BLE: 3.423dBm 2.4G: 1.697dBm
		Antenna Gain:	1.2dBi PCB Antenna
Power Supply	:	Input: DC 5V DC 3.7V by 140mAh Rechargeable Li-ion battery	
Software Version	:	MK321-Pro_V1.2	
Hardware Version	:	MK321-Pro_P1	
Remark: The antenna gain provided by the applicant, the adapter and verified for the RF conduction test and adapter provided by TOBY test lab.			

Note: More test information about the EUT please refer the RF Test Report.

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The RF Exposure Evaluation for FCC:

SAR Test Exclusion Calculations

FCC: According to 447498 D04 Interim General RF Exposure Guidance v01.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

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

where

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

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Calculation:

Test separation: 5mm					
BLE(1Mbps)					
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mW)	Limit P_{th}(mW)
2.402	2.176	2±1	3	1.995	3
2.440	2.955	3±1	4	2.512	3
2.480	3.334	3±1	4	2.512	3
BLE(2Mbps)					
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Limit P_{th}(mW)
2.402	2.347	2±1	3	1.995	3
2.440	3.023	3±1	4	2.512	3
2.480	3.423	3±1	4	2.512	3

2.4G					
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Limit P_{th}(mW)
2.405	1.697	2±1	3	1.995	3
2.440	0.939	1±1	2	1.585	3
2.476	0.232	0±1	1	1.259	3
The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 D04, No SAR is required.					

Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06, No SAR is required.

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