RF Exposure Evaluation

FCC ID: RDS-HFD869

1. Client Information

Applicant	:	Shenzhen Hi-FiD Electronics Co., Ltd.
Address	:	C2, 28th floor of Dongjiang Building, Longjing Road, 3rd Area, Bao'an District, Shenzhen City, China
Manufacturer	:	Shenzhen Hi-FiD Electronics Co., Ltd.
Address	:	C2, 28th floor of Dongjiang Building, Longjing Road, 3rd Area, Bao'an District, Shenzhen City, China

2. General Description of EUT

EUT Name	:	Bluetooth Speaker	
Models No.	:	HFD-869, HFD-869BT, HFD-880, HFD-886, HFD-889	
Model Difference	:	The different models are identical in schematic, structure and critical component, the only different is the appearance.	
Product Description	:	Operation Frequency: 2402MHz~2480MHz	
		Number of Channel:	Bluetooth:79Channels
		Out Power:	GFSK: 6.65 dBm Conducted Power 8DPSK: 5.93 dBm Conducted Power
		Antenna Gain:	-0.5 dBi PCB Antenna
		Modulation Type:	GFSK 1Mbps(1 Mbps) π/4-DQPSK(2 Mbps) 8-DPSK(3 Mbps)
Power Supply	:	DC Voltage supplied from Host System by USB cable DC Voltage supplied by Li-ion battery.	
Power Rating	:	DC 5.0V from USB Li-ion battery DC 3.7V 2500mAh	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

Note:

More test information please refer the RF Test Report.

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
Tel: +86 75526509301 Fax: +86 75526509195

MPE Calculations

1. **FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies V05.**
   (1) Clause 4.3: General SAR test reduction and exclusion guidance
   Sub clause 4.31: Standalone SAR test exclusion considerations
   1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance≤50 mm are determined by:
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤3.0 for 1-g SAR
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤7.5.0 for 10-g SAR

Calculation:
The maximum power is 6.15 dBm(4.121mW) @2.480GHz
Separation Distance: 5mm
For 1-g SAR Result: 1.298≤3.0
Pass

So standalone SAR measurements are not required.

(2) Appendix A: SAR Test Thresholds for 100MHz~6GHz and ≤50mm.

SAR can be exempted if the output power is less than the SAR exclusion Threshold: For F=2450, and Distance=5mm, the output power is less than 10mW (10 dBm).

Please see the follow table:

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

MHz	30	35	40	45	50	mm
150	232	271	310	349	387	SAR Test Exclusion Threshold (mW)
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

1. **Calculation:**
   EIRP= P+G
   Where P=Conducted Output Power (dBm)
   G=Power Gain of the Antenna (dBi)

   So

Bluetooth Mini Speaker				
GFSK (1Mbps)				
Test Mode	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)
2402 MHz	3.96	-0.5	3.46	2.218
2441 MHz	5.68	-0.5	5.18	3.296
2480 MHz	6.65	-0.5	6.15	4.121
D-QPSK (3Mbps)				
Test Mode	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)
2402 MHz	2.44	-0.5	1.94	1.563
2441 MHz	4.76	-0.5	4.26	2.669
2480 MHz	5.93	-0.5	5.43	3.491

2. **Conclusion:**
No SAR Evaluation required since Transmitter EIRP is bellow FCC threshold.

Note
For a more detailed features description, please refer to the RF Test Report.