# RF Exposure Evaluation

## *FCC ID: 2AF7A-F20*

## 1. Client Information

| | | |
|---|---|---|
| **Applicant** | : | Shenzhen Mercury Innovations Science and Technology Ltd |
| **Address** | : | The 3rd and 5th Floor, Building A1, Tongfuyu Industrial Park, Xixiang, Baoan District, Shenzhen, China |
| **Manufacturer** | : | Shenzhen Mercury Innovations Science and Technology Ltd |
| **Address** | : | The 3rd and 5th Floor, Building A1, Tongfuyu Industrial Park, Xixiang, Baoan District, Shenzhen, China |

## 2. General Description of EUT

| | | | |
|---|---|---|---|
| **EUT Name** | : | Wearable Outdoor Sports Speaker | |
| **Models No.** | : | F20 | |
| **Model difference** | : | N/A | |
| **Product Description** | : | Operation Frequency:<br>Bluetooth(BLE):2402~2480MHz | |
| | | Number of Channel: | Bluetooth:79 Channels<br>BLE: 40 channels |
| | | Max Peak Output Power: | Bluetooth: 4.00 dBm(8-DPSK)<br>BLE: 2.36 dBm |
| | | Antenna Gain: | 0 dBi PCB Antenna |
| | | Modulation Type: | GFSK 1Mbps(1 Mbps)<br>π/4-DQPSK(2 Mbps)<br>8-DPSK(3 Mbps) |
| **Power Supply** | : | DC Voltage supplied from Host System by USB cable.<br>DC power by Li-ion Battery. | |
| **Power Rating** | : | DC 5.0V by USB cable.<br>DC 3.7V 800mAh Li-ion Battery. | |
| **Connecting I/O Port(S)** | : | Please refer to the User's Manual | |

**Note:**

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



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# SAR Test Exclusion Calculations

1. **FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v05r02.**
   **(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≤5 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**

**2.**

## Calculation:

| Test separation: 5mm | | | | | |
|---|---|---|---|---|---|
| **Bluetooth Mode (GFSK)** | | | | | |
| **Frequency (GHz)** | **Conducted Power (dBm)** | **Turn-up Power Tolerance (dB)** | **Max power of tune up tolerance (mw)** | **Calculation Value** | **Threshold Value** |
| 2.402 | 2.25 | ±0.5 | 1.884 | 0.584 | **3.0** |
| 2.441 | 2.39 | ±0.5 | 1.945 | 0.608 | **3.0** |
| 2.480 | 2.01 | ±0.5 | 1.782 | 0.561 | **3.0** |
| **Bluetooth Mode ( π /4-DQPSK)** | | | | | |
| **Frequency (GHz)** | **Conducted Power (dBm)** | **Turn-up Power Tolerance (dB)** | **Max power of tune up tolerance (mw)** | **Calculation Value** | **Threshold Value** |
| 2.402 | 3.48 | ±0.5 | 2.500 | 0.775 | **3.0** |
| 2.441 | 3.61 | ±0.5 | 2.576 | 0.805 | **3.0** |
| 2.480 | 3.10 | ±0.5 | 2.291 | 0.722 | **3.0** |
| **Bluetooth Mode (8-DPSK)** | | | | | |
| **Frequency (GHz)** | **Conducted Power (dBm)** | **Turn-up Power Tolerance (dB)** | **Max power of tune up tolerance (mw)** | **Calculation Value** | **Threshold Value** |
| 2.402 | 4.00 | ±0.5 | 2.818 | 0.874 | **3.0** |
| 2.441 | 3.96 | ±0.5 | 2.793 | 0.873 | **3.0** |
| 2.480 | 3.44 | ±0.5 | 2.477 | 0.780 | **3.0** |
| **BLE(GFSK)** | | | | | |
| **Frequency (GHz)** | **Conducted Power (dBm)** | **Turn-up Power Tolerance (dB)** | **Max power of tune up tolerance (mw)** | **Calculation Value** | **Threshold Value** |
| 2.402 | 2.31 | ±0.5 | 1.910 | 0.592 | **3.0** |
| 2.442 | 2.36 | ±0.5 | 1.932 | 0.604 | **3.0** |
| 2.480 | 2.02 | ±0.5 | 1.786 | 0.563 | **3.0** |

**So standalone SAR measurements are not required.**