

RF EXPOSURE EVALUATION

1. PRODUCT INFORMATION

Product Description	Wireless hands free car kit
Model Name	BTFM3B, BTFM3-SPB, BTFM3SR-SP
FCC ID	IKQBTFM3B

2. EVALUATION METHOD

According to 447498 D01 General RF Exposure Guidance v05

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

Where $f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

3. CALCULATION

According to the follow transmitter output power (P_t) formula :

$$P_t = (E \times d)^2 / (30 \times g_t)$$

P_t =transmitter output power in watts

g_t =numeric gain of the transmitting antenna (unitless)

E =electric field strength in V/m

d =measurement distance in meters (m)

$$\text{BT } P_t = -1.449\text{dBm} = 0.72\text{mW}$$

The result for RF exposure evaluation

$$\text{SAR} = (0.72\text{mW} / 5\text{mm}) \cdot [\sqrt{2.48(\text{GHz})}] = 0.23 < 3.0 \text{ for 1-g SAR}$$

$$\S 15.239$$

$$\text{FM } P_t = -51.74\text{dBm} = 0.0000067\text{mW}$$

The value of the Maximum output power P_t is referred to the test report of the CFR47

For frequencies below 100 MHz and test separation distances ≤ 50 mm , the power threshold determined by the following:

$$P_{\text{max}} = 0.5 \times 474 \times [1 + \log(100/f)] \text{ mW, where } f \text{ is MHz}$$

$$\text{For } 88.1\text{MHz}, P_{\text{max}} = 250\text{mW. } P_t < P_{\text{max.}}$$

$$\text{For } 107.9\text{MHz}, P = 3 \times 5 / 0.1079^{0.5} = 45.7 \text{ mW}$$

$$P_{\text{max}} = 45.7\text{mW. } P_t < P_{\text{max.}}$$

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Attestation of Global Compliance(Shenzhen)Co., Ltd

Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/



Simultaneous transmission between Bluetooth and FM transmitter:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] • [√ f(GHz)/x] W/kg, for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

$$\text{SAR}=(0.23+0.00000041)/7.5=0.031\text{W/kg}<1.6\text{W/kg}$$

4. CONCLUSION

The SAR evaluation is not required.

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