

RF EXPOSURE EVALUATION

1. PRODUCT INFORMATION

Product Description	Car Bluetooth FM transmitter
Model Name	F53
FCC ID	W8D-F53

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)

$$\text{BT } P_t = -0.082\text{dBm} = 0.98\text{mW}$$

The result for RF exposure evaluation

$$\text{SAR} = (0.98\text{mW} / 5\text{mm}) \cdot [\sqrt{2.48(\text{GHz})}] = 0.31 < 3.0 \text{ for 1-g SAR}$$

$$\text{FM } P_t = 0.0000091\text{mW}$$

The result for RF exposure evaluation

$$\text{SAR} = (0.0000091\text{mW} / 5\text{mm}) \cdot [\sqrt{0.1079(\text{GHz})}] = 0.00000060 < 3.0 \text{ for 1-g SAR}$$

Simultaneous transmission between Bluetooth and FM transmitter

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$, for test separation distances ≤ 50 mm;

where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

$$\text{SAR} = (0.31 + 0.00000060) / 7.5 = 0.041\text{W/kg} < 1.6\text{W/kg}$$

4. CONCLUSION

The SAR evaluation is not required.