

RF Exposure evaluation

Product Description: Bluetooth Speaker

Model Number: BT223DS-N

FCC ID: Q8W-BT223DS-N

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

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)

According to the formula described above:

$$E_{\text{max}} = \underline{88.72} \text{ dBuV/m} = \underline{0.027} \text{ V/m}, d = 3\text{m}, g_t = 1.12$$

$$P_t = (E \times d)^2 / (30 \times g_t) = (0.027 \times 3)^2 / (30 \times 1.12) = \underline{0.000199482} \text{ W} = \underline{0.2} \text{ mW}$$

The result is rounded to one decimal place for comparison

Worse case is as below: [2402MHz **0.2mW** output power]

$$(0.2\text{mW} / 5\text{mm}) \cdot [\sqrt{2.402(\text{GHz})}] = \underline{0.06} < 3.0 \text{ for 1-g SAR}$$

Then SAR evaluation is not required

NOTE: For the maximum power, you can refer FCC test report.