

RF Exposure evaluation

Product Description: DSP Subwoofer with built-in 4-Channel Amplifier

Model Number: BT-001

FCC ID: DVU-PWD-X5

IC: 700A-PWDX5

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 above test data,

$$P_t = 4.12 \text{ dBm} = 2.58 \text{ mW}$$

The result is rounded to one decimal place for comparison

Worse case is as below: [2441MHz -2.58mW output power]

$$(2.58 \text{ mW} / 5 \text{ mm}) \cdot [\sqrt{2.440(\text{GHz})}] = 0.80 < 3.0 \text{ for 1-g SAR}$$

Then SAR evaluation is not required

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

According to Clause 2.5.1 of RSS-102 Issue 5 SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency(MHz)	At separation distance of ≤ 5 mm
2450	4 mW

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

$$P_{MAX}=4.12\text{dBm}$$

$$\text{Antenna gain}=0\text{dBi}$$

$$P_{EIRP}=4.12+0=4.12\text{dBm}=2.58\text{mW} < 4\text{mW}$$

Then SAR evaluation is not required

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