

RF Exposure Compliance Requirement

1. Standard requirement

15.247(b)(4) requirement:

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
general population	(60/fGHz) mW. $d < 2.5$ cm (120/fGHz) mW. $d \geq 2.5$ cm	(900/fGHz) mW. $d < 20$ cm
occupational	(375/fGHz) mW. $d < 2.5$ cm (900/fGHz) mW. $d \geq 2.5$ cm	(2250/fGHz) mW. $d < 20$ cm

When $d > 20$ cm, the EUT should mark the recommend use distance for EUT external antenna and the $MPE = 1 \text{ mW/cm}^2$.

2. EUT RF Exposure

The Max Conducted Peak Output Power is 16.71 dBm(46.88mW) in channel 6;

The best case gain of the antenna is 3.0dBi.

3.0dB logarithmic terms convert to numeric result is nearly 2.0

According to the formula, calculate the EIRP test result:

$$EIRP = P \times G = 46.88 \text{ mW} \times 2.0 = 93.76 \text{ mW}$$

$$S = 1 \text{ mW/cm}^2$$

$$\text{So, } R = \sqrt{\frac{PG}{4\pi S}} = \sqrt{\frac{46.88 \times 2.0}{4 \times 3.14 \times 10000}} = 2.73 \text{ cm}$$

So the recommend use distance for EUT external antenna is larger than 2.73 centimeter.