

7.8 RF Exposure Compliance Requirement

7.8.1 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

7.8.2 Output power Results:

Test Channel	Modulation	Fundamental Frequency (MHz)	Reading Power (dBm)	Cable Loss (dB)	Output Power	
					(dBm)	(mW)
Lowest	GFSK	2402	5.15	0.5	5.65	3.673
Middle	GFSK	2441	5.01	0.5	5.51	3.556
Highest	GFSK	2480	5.27	0.5	5.77	3.776
Lowest	$\pi/4$ DQPSK	2402	3.15	0.5	3.65	2.317
Middle	$\pi/4$ DQPSK	2441	2.86	0.5	3.36	2.168
Highest	$\pi/4$ DQPSK	2480	2.97	0.5	3.47	2.223
Lowest	8DPSK	2402	3.42	0.5	3.92	2.466
Middle	8DPSK	2441	3.15	0.5	3.65	2.317
Highest	8DPSK	2480	3.31	0.5	3.81	2.404

Mark: the RF output power is from report SHEM121000145301 section7.7. So the test method please reference the report section 7.7.

7.8.3 EUT RF Exposure

The Max Conducted Peak Output Power is 5.77dBm(3.776mW) at 2480MHz.

And the antenna gain at 2402MHz is -0.5dBi PCB integrated in the actual use logarithmic terms convert to numeric result is nearly 0.891;

According to the formula, calculate the EIRP test result:

$$EIRP = P \times G = 3.776 \text{ mW} \times 0.891 = 3.364 \text{ mW} \quad (1)$$

SAR requirement:

$$S = 60 / f(\text{GHz}) = 60 / 2.402 = 24.979 \text{ mW} \quad (2) ;$$

$$(1) < (2).$$

So the SAR test for Bluetooth is not required.