RADIO FREQUENCY EXPOSURE

LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §15.247(b)(4) and §1.1307(b)(1) of this chapter.

Conducted Power Results

Bluetooth

Mode	Channel	Frequency(MHz)	Average Conducted Output Power (dBm)
GFSK	00	2402	-4.77
	39	2441	-5.35
	78	2480	-5.92
8DPSK	00	2402	-8.41
	39	2441	-9.19
	78	2480	-9.86
π/4DQPSK	00	2402	-4.23
	39	2441	-5.19
	78	2480	-5.26

Manufacturing tolerance

Bluetooth

GFSK (AVG)			
Channel	Channel 00	Channel 39	Channel 78
Target (dBm)	-4.0	-5.0	-5.0
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (AVG)			
Channel	Channel 00	Channel 39	Channel 78
Target (dBm)	-8.0	-9.0	-9.0
Tolerance ±(dB)	1.0	1.0	1.0
π/4DQPSK (AVG)			
Channel	Channel 00	Channel 39	Channel 78
Target (dBm)	-4.0	-5.0	-5.0
Tolerance ±(dB)	1.0	1.0	1.0

EUT Specification

EUT	Bluetooth Speaker
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☒ Bluetooth: 2.402GHz~ 2.480GHz ☐ Others _
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others _____
Exposure classification	☐ Occupational/Controlled exposure *(S = 5mW/cm^2)* ☒ General Population/Uncontrolled exposure *(S=1mW/cm^2)*
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☒ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	-4.11dBm (0.39mW)
Antenna gain (Max)	0dBi (Numeric gain:1)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Note:

1. *The maximum output power(including turn tolerance) is -4.11dBm (0.39mW) and maximum antenna gain is 0dBi*
2. *For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*

TEST RESULT

No non-compliance noted.

Calculation

Given $S = \frac{P \times G}{4\Pi d^2}$ ***Equation 1***

Where *d = distance in cm*

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW / cm²

Maximum Permissible Exposure

EUT Output Power=0.39mW

Numeric antenna gain=1.0

Substituting the MPE safe distance using d=20 cm into ***Equation 1*** :

Fields

The power density S = $0.39 \times 1.0 / (4\Pi \times 400)$ cm^2 = $7.76 * e^{-5}$ mW/cm^2

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)