FCC RF Exposure evaluation

FCC ID: 2ABPGDKBIGBOX

Product Category:	Portable Device
Exposure Category:	General population/uncontrolled environment
Applicable Standard(s):	KDB 447498 D01 General RF Exposure Guidance v06
	FCC Part 2 §2.1093
Antenna Gain:	0 dBi

According to KDB 447498 D01 General RF Exposure Guidance v06 Section 4.3.1 for Standalone SAR test exclusion considerations "Unless specifically required by the *published RF exposure KDB procedures*, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding *SAR Test Exclusion Threshold condition(s)*, listed below, is (are) satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum *test separation distance* required for the exposure conditions.[28] The minimum *test separation distance* defined in 4.1 f) is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander. To qualify for SAR test exclusion, the *test separation distances* applied must be fully explained and justified, typically in the SAR measurement or SAR analysis report, by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, according to the required *published RF exposure KDB procedures*. When no other RF exposure testing or reporting are required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for SAR test exclusion. When required, the device specific conditions described in the other *published RF exposure KDB procedures* must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops and tablets, etc. [29] "

a) For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g SAR *test exclusion thresholds* are determined by the following:

[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [$\sqrt{f}_{(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,[30] where:

• $f_{(GHz)}$ is the RF channel transmit frequency in GHz
• Power and distance are rounded to the nearest mW and mm before calculation[31]
• The result is rounded to one decimal place for comparison
• 3.0 and 7.5 are referred to as the *numeric thresholds* in the step b) below
The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f). is applied to determine SAR test exclusion.

Conducted Power Results (can use Average values, but Peak values applied for calculation, representing worst case)

Mode: **BT**	Channel	Frequency (MHz)	Measured (dBm)	Measured (mW)	Target (dBm)	Tolerance ±(dB)
GFSK	00	2402	6.234	4.201	4.0	1.0
	39	2441	5.654	3.676	5.0	1.0
	78	2480	**6.234**	4.201	**6.0**	**1.0**
π/4-DQPSK	00	2402	1.795	1.512	2.0	1.0
	39	2441	4.185	2.621	4.0	1.0
	78	2480	4.979	3.147	5.0	1.0
8DPSK	00	2402	2.243	1.676	2.0	1.0
	39	2441	5.654	3.676	4.0	1.0
	78	2480	5.350	3.428	5.0	1.0

Mode: **BLE**	Channel	Frequency (MHz)	Measured (dBm)		Target (dBm)	Tolerance ±(dB)
GFSK	00	2402	2.243	1.676	4.0	1.0
	39	2441	5.654	3.676	5.0	1.0
	78	2480	6.610	4.581	6.0	1.0

Evaluation Results

Band / Mode (worst case)	f (GHz)	Antenna Distance (mm)	RF output power (including tune-up tolerance)			SAR Test Exclusion Threshold	SAR Test Exclusion Conclusion
			dBm	mW	mW (round-up)		
BT: GFSK	**2.45**	**5**	**7**	5.01	**5**	**1.565 ≤ 3.0**	**PASS**