

Portable device

According to §15.247(e)(i) and §1.1307(b)(1), 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 level in excess of the Commission's guidelines.

According to KDB447498 D01 General RF Exposure Guidance V06

The 1-g SAR 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
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

BLE:

Modulation	Channel Freq. (GHz)	Conducted power (dBm)	Conducted power (mW)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Distance (mm)	Result calculation	SAR Exclusion threshold	SAR test exclusion
BLE 1M	2.402	3.88	2.44	3±1	4	2.51	<5	0.77860	3.00	YES
	2.440	3.88	2.44	3±1	4	2.51	<5	0.78474	3.00	YES
	2.480	3.48	2.23	3±1	4	2.51	<5	0.79114	3.00	YES
BLE 2M	2.402	3.89	2.45	3±1	4	2.51	<5	0.77860	3.00	YES
	2.440	3.82	2.41	3±1	4	2.51	<5	0.78474	3.00	YES
	2.480	3.66	2.32	3±1	4	2.51	<5	0.79114	3.00	YES

Conclusion:

For the max result : $0.79114 \leq 3.0$ for 1g SAR, SAR is not required.

NFC

Antenna Type: Internal antenna

Antenna Gain: 0dBi

Nominal field strength: 78.4dBµV/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB

According to the KDB 447498:

Based on the Maximum allowed field strength of production tolerance was 81.4 dBµV/m

at 3m in frequency 13.56MHz, thus;

The EIRP = $[(\text{FS} \cdot \text{D})^2 \cdot 1000 / 30] = 0.042\text{mW}$

Conducted power = Radiated Power (EIRP) – Antenna Gain

So;

Conducted Power = 0.042mW.

The SAR Exclusion Threshold Level for 13.56MHz when the minimum test separation

distance is $< 50\text{mm}$:

$= [474 * (1 + \log_{10}(f(\text{MHz})))]/2$

$= 442.7\text{mW}$

Conclusion:

Since the above conducted output power is well below the SAR Exclusion threshold level,

so the EUT is considered to comply with SAR requirement without testing.

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