RF Exposure Evaluation

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1093，
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.

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, where
    $f_{(GHz)}$ 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

Here,
For Bluetooth

Mode	Max Power (dBm)	Tune-up power (dBm)	Max Power (mW)	Frequency(MHz)	Min. Distance (mm)	Calc. thresholds	limit
BLE	-1.21	-1±1	0.78	2480	5	0.3100	3.0

So a SAR test is not required

RF Exposure Evaluation

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 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 channe requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.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.

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):
1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by
$[1 + \log(100/f(MHz))]$
2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

(1)$Pb(mW)*[1+\log(100/f(MHz))]= 474mW*[1+\log(100/f(MHz))]$
(2)$Pb(mW)*[1+\log(100/f(MHz))]*0.5=474mW*[1+\log(100/f(MHz))]*0.5=237*[1+\log(100/f(MHz))]$

Test Procedure:

TX frequency range: 13.56MHz

Device category: Portable device (Distance: 5mm) Max.

Field Strength: 104.40dBuV/m @3m

EIRP=E-104.7+20logD=104.41-104.7+20log3=9.25dBm

Maximum Conducted Output Power: 9.25dBm

Turn-up: 9±1

Here,

Frequency(MHz)	Min. Distance (mm)	Max Power (dBm)	Tune-up power (dBm)	Max Power (mW)	Limit (mW)	SAR Test Exclusion
13.56	≤ 50	9.25	9±1	10	442.654	Yes

So a SAR test is not required