5 FCC §15.247(i) §2.1093 - RF Exposure

5.1 Applicable Standards

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 $\leqslant$ 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)] $\cdot$ [$\sqrt{}$ f(GHz)] $\leqslant$ 3.0 for 1-g SAR, and $\leqslant$ 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 calculation31
   - The result is rounded to one decimal place for comparison
   - The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

   The test exclusions are applicable only when the minimum test separation distance is $\leqslant$ 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.

5.2 Test Exclusion Result

Radio	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Test Distance (mm)	Max SAR Level Reported for 1-g (W/kg)	FCC Limit 1-g SAR Limit (W/kg)
900 MHz[1]	912	2.36	-	-	-	6.5	1.43	1.6
Radio	**Frequency (MHz)**	**Antenna Gain (dBi)**	**Maximum Power (dBm)**	**Maximum Power (mW)**		**Test Distance (mm)**	**Power Threshold (mW)**	
BLE[2]	2440	1.0	-3.87	0.41		6.5	≤ 4.53	

Note 1: SAR results were used in lieu of Maximum Output Power, please refer to R2408161-SAR Report

Note 2: BLE data was referenced from Centre of Testing Service, report number CGZ3161014-01896-EFI, FCC ID: 2AA9B05. Note that Power used instead of ERP since Power is greater in this case.

Note 3: BLE was evaluated per 1.1307(b)(3)(i)(B).

The below formula is for considering the total co-located output power

$$\frac{Test\ Exclusion\ Threshold}{Limit} + \frac{Test\ Exclusion\ Threshold}{Limit} \leq 1.0$$

Thus,

$$\frac{1.43}{1.6} + \frac{0.41}{4.53} = 0.984$$

The combined ratios of the 900 MHz and BLE emissions is 0.985, therefore, the radios meet exclusion considerations.