FCC§15.247 (I), §1.1310 &§2.1093 –RF EXPOSURE

Applicable Standard

According to§2.1093and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

(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)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.

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.

b) 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:

1) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

2) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

Measurement Result
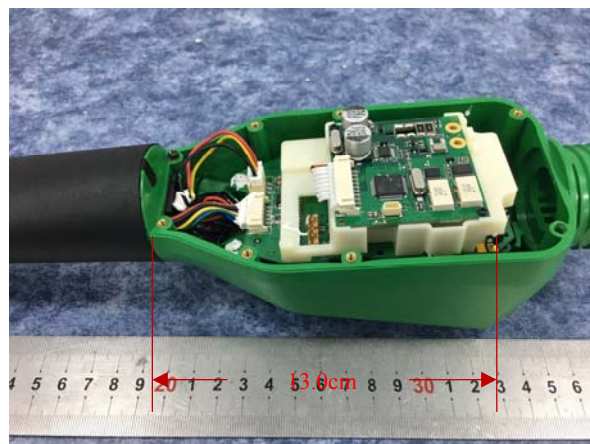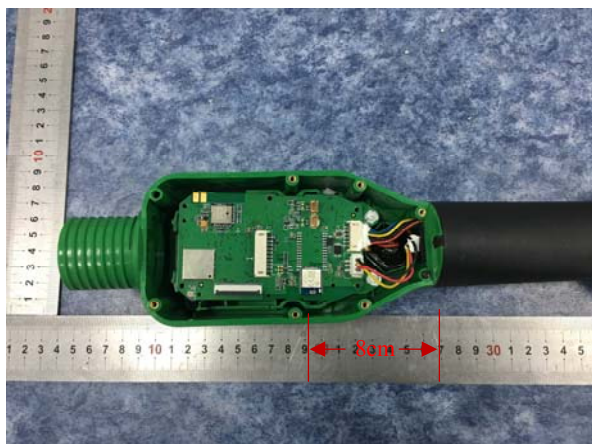
Mode	Frequency Range (MHz)	Max Tune-up Conducted Power		Calculated Distance (mm)	limit (mW)	SAR Test Exclusion
		(dBm)	(mW)			
Wi-Fi 802.11b	2412-2462	21.0	125.89	130	1038.9	Yes
Wi-Fi 802.11g		25.0	316.23	130	1038.9	Yes
Wi-Fi 802.11n-HT20		25.0	316.23	130	1038.9	Yes
Wi-Fi 802.11n-HT40	2422-2452	25.0	316.23	130	1038.9	Yes
BLE	2402-2480	6.5	4.47	80	538.9	Yes
Bluetooth	2402-2480	16.0	39.81	80	538.9	Yes

Note: The EUT is a handheld device.

Result: No SAR test is required.

Simultaneous SAR test exclusion considerations:

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

[(*max. power of channel, including **tune-up tolerance**, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg, 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.
where *x* = 18.75 for 10-g SAR.

Wi-Fi and BT can transmit simultaneously, The worst condition is 802.11n-HT20 of Wi-Fi & BT, as below:

ΣSAR=316.23/100*(√ 2.462/18.75)+39.81/100*(√ 2.480/18.75)= 0.26+0.03=0.29<1.0 W/kg

Conclusion: ΣSAR < 1.0 W/kg therefore simultaneous transmission SAR is not required.