RF Exposure evaluation

FCC ID: 2BSOH-WC-NODE-A

According to 447498 D01 General RF Exposure Guidance v06

a) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(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

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

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 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

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion:

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

3) SAR measurement procedures are not established below 100 MHz.

NFC(13.56MHz):

Channel Frequency (MHz)	Max Output power (dBm)	Max tune-up tolerance Output power (dBm)	Max Output power (dBm)	Max Output power	Threshold Value (mW)
13.56	-42.088	-42.088±1	-41.088	0.000078	442.7

$$E = EIRP - 20\log D + 104.8$$

where:

E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.

EIRP=E-104.8+20logD= 53.17 -104.8+20log3= -42.088dbm

Power allowed at numeric threshold=[Step a allowed power(474mW)+(separation distance 50-50)*(100/150)]*[1+log(100/13.56)]/2=442.7mW

According to KDB447498 D01 V6, threshold at which no SAR required is ≤442.7 for Power allowed at numeric threshold, separation distance is 5mm, and no simultaneous SAR measurement is required.

The SAR measurement is not necessary.

BLE:

Worse case output power is as below: [2402MHz: -1.53dBm]

Maximum output power is -1.53dBm (0.70 mW).

(0.70mW /5mm)·[√2.402(GHz)]= 0.22<3.0 for 1-g SAR.

Then SAR evaluation is not required.