RF Exposure Evaluation
Portable Device Evaluation Method and Limit
Following FCC KDB 447498 D01v06 "General SAR test exclusion guidance" The corresponding SAR Exclusion Threshold condition, listed below.
The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances≤50mm 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 theRF 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.

At 100 MHz to 6 GHz and for test separationdistances> 50 mm. the SAR test exclusion threshold is determined according to the following:
[Threshold at 50 mm in step 1) + (test separation distance -50mm) (f(MHz)/150)] mW, at 100MHz to 1500 MHz;
[Threshold at 50 mm in step 1) + (test separation distance -50 mm)-10]mW at > 1500 MHz and ≤6GHz;

At frequencies below 100 MHz, the following may be considered for SAR test exclusion. The threshold at the corresponding test separation distance at100 MHz in step 2) is multiplied by [1 +log(100/f(MHz))] for test separation distances > 50 mm and <200 mm. The threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by 1/2 for test separation distances ≤50 mm.
SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determineSAR evaluation requirements for any test results to be acceptable.

Mobile Device Evaluation Method and Limit

Human exposure to RF emissions from mobile devices(47 CFR S2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

Limits For General Population / Uncontrolled Exposure

Frequency Range (MHz)	E-field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (Minutes)
0.3 -- 1.34	614	1.63	(100)*	30
1.34 -- 30	824/f	2.19/f	(180/f^2)*	30
30 -- 300	27.5	0.073	0.2	30
300 -- 1500	--	--	f/1500	30
1500 -- 100,000	--	--	1.0	30

*Note:

1. f= Frequency in MHz* Plane-wave Equivalent Power Density

2. The averaging time for General Population/Uncontrolled exposure to fixed transmitters is not applicable for mobile and portable transmitters. See 47 CFR sS2.1091 and 2.1093 on source-based time-averaging requirement for mobile and portable transmitters.

Where

Pd = power density in mW/cm^2, **Pout** = output power to antenna in mW;

G = gain of antenna in linear scale, **Pi** = 3.1416;

R = distance between observation point and center of the radiator in cm

$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$

EIRP   is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m

d_{Meas} is the measurement distance, in m

Here,

Field strength (dBuV/m)	EIRP (dBm)	Max tune-up (mW)	Frequency (MHz)	Min. distance(mm)	Calc. thresholds	limit
84.61	-10.5	0.09	2480	5	0.03	3.0

Field strength (dBuV/m)	Max Output power (dBm)	Max Output power (mW)	Frequency (MHz)	Threshold Value (mW)
64.59	-30.6	0.0009	13.56	442.97

For Simultaneous transmitting, 1): The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits =0.03/3 + 0.0009/442.97 = 0.01< 1 Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is ⩽ 1.0, the EUT is considered to satisfy MPE compliance for simultaneous transmission operations.

So a SAR test is not required